JOHNSON
Cornell University

INSEAD
The Business School for the World®

WIPO
WORLD INTELLECTUAL PROPERTY ORGANIZATION

The Global Innovation Index 2015

Effective Innovation Policies for Development

Confederation of Indian Industry

ATKearney

IMPrOve academy

JOHNSON
Cornell University

INSEAD
The Business School
for the World®

WIPO
WORLD
INTELLECTUAL PROPERTY
ORGANIZATION

The Global Innovation Index 2015

Effective Innovation Policies for Development

Soumitra Dutta, Bruno Lanvin, and **Sacha Wunsch-Vincent**
Editors

Confederation of Indian Industry

ATKearney

The Global Innovation Index 2015: Effective Innovation Policies for Development is the result of a collaboration between Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO) as co-publishers, and their Knowledge Partners.

The terms 'country', 'economy', and 'nation' as used in this report do not in all cases refer to a territorial entity that is a state as understood by international law and practice. The terms cover well-defined, geographically self-contained economic areas that may not be states but for which statistical data are maintained on a separate and independent basis.

Suggested citation: Cornell University, INSEAD, and WIPO (2015): *The Global Innovation Index 2015: Effective Innovation Policies for Development,* Fontainebleau, Ithaca, and Geneva.

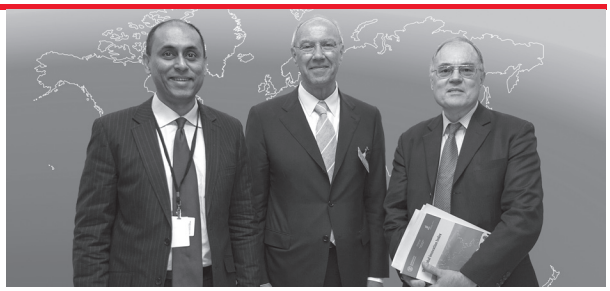
ISSN 2263-3693

ISBN 978-2-9522210-8-5

Printed and bound in Geneva, Switzerland, by the World Intellectual Property Organization.

Contents

Releasing the Global Innovation Index 2015: Effective Innovation Policies for Development



©WIPO, 2015. Photo by Emmanuel Berrod.

We are pleased to present the 2015 Global Innovation Index (GII) with this year's theme of 'Effective Innovation Policies for Development'.

Innovation-driven growth is no longer the prerogative of high-income countries alone. Developing countries increasingly design policies intended to increase their innovation capacity. Innovation policies have taken different forms, depending on countries' perceived needs; their impact has also varied across countries at similar levels of development. Certain developing countries have managed to continually improve their innovation inputs and outputs. Others still struggle.

The difference in the impact of innovation policies raises a number of questions, including: Which developing countries outperform in innovation relative to their level of development and their peers? How do the innovation actors of these countries meaningfully design and implement effective innovation policies and practices?

One objective of this year's GII is to seek answers to these questions by taking advantage of the rich time-series dataset it has produced since 2011. Independent from the yearly changes in rankings, our analysis identifies economies that consistently overperform when compared with those of a similar level of development. Although not even a decade ago many of these low- and middle-income economies were not on the innovation map, they are now increasingly part of a more globalized innovation landscape. Their experience holds lessons for other countries and for the global distribution of innovation more broadly.

Over the last eight years, the GII has established itself as a leading reference on innovation, providing a tool for action for decision makers. In 2013 the GII was launched by the United Nations (UN) Secretary-General Ban Ki-moon in Geneva at the High-Level Segment of the UN Economic and Social Council. In 2014, as part of Australia's preparations to host the annual Group of Twenty (G20) Leaders' Summit, we joined Australia's Minister for Industry Ian Macfarlane at a gathering of international business leaders in Sydney to launch the GII. The discussion centred on how innovation can help achieve the G20's growth targets. In addition, GII-related meetings took place in Africa, Asia, the Middle East, and North and Latin America, with the aim of improving data availability, innovation performance, and policy. In 2015 our goal is to intensify the use of the GII to assist developing countries to further improve their innovation systems.

This year we welcome A.T. Kearney and its IMP³rove – European Innovation Management Academy as a new Knowledge Partner. We thank our other current Knowledge Partners—the Confederation of Indian Industry and du—for their continued support. We also thank Huawei, in particular Ken Hu, its Rotating CEO, for making key contributions as a Knowledge Partner over the last two years.

Likewise, we thank our prominent Advisory Board, which has been enriched by five new members this year: Yuko Harayama, Executive Member, Council for Science, Technology and Innovation, Cabinet Office, Government of Japan, Japan; Hugo Hollanders, Senior Researcher, United Nations University – Maastricht Economic and Social Research Institute on Innovation and Technology (UNU-MERIT), the Netherlands; Beethika Khan, Program Director, National Science Foundation (NSF), United States of America; Mary O'Kane, Professor, NSW Chief Scientist and Engineer, Australia; and Houlin Zhao, Secretary-General, International Telecommunication Union (ITU).

We hope that the collective efforts of innovation actors using the GII will continue to pave the way for better innovation policies around the world.

Soumitra Dutta
Dean, Samuel Curtis Johnson Graduate School of Management, Cornell University

Francis Gurry
Director General, World Intellectual Property Organization

Bruno Lanvin
Executive Director for Global Indices, INSEAD

The Innovation Imperative

In advising the world's leading private- and public-sector organizations, providing innovative solutions that deliver sustained value to our clients is central to our success. While our firm has a long history—nearly 90 years—of being innovative, we also recognize that innovation can all too easily slip into the background. Supporting innovation is one thing; actively driving and creating an innovative culture is quite another.

As a result, a few years ago, as part of A.T. Kearney's broader strategic vision, we launched a new innovation initiative. Through a series of related initiatives that encourage colleagues to collaborate and advance innovative ideas, we have seen a remarkable surge of enthusiasm, passion, and results. Indeed, the first ideas sparked by the initiative are already bearing fruit.

Our experience in fostering innovation is on a small scale, but it also speaks to the key theme of the *Global Innovation Index 2015:* Innovation requires the right policies to actively support and sustain it. As countries and regions develop economic growth strategies, the imperative to put innovation at the top of the agenda has never been stronger.

Our 2015 Foreign Direct Investment Confidence Index, which assesses likely foreign investment decisions by global business leaders, finds that investors are readily looking past emerging countries that boast low labour costs in favour of developed countries that are committed to—and can demonstrably show—continuous innovation. In fact, three-quarters of the top investment destinations are still developed economies.

The question is: How can a developing country make—and sustain—the shift to an innovation-driven economy? The lessons in these pages provide invaluable insights from some of the world's leading authorities. Certainly there are many nuances to consider, but some of the basics are remarkably consistent: Address and engage all stakeholders and support them in developing a strong ecosystem of innovation. Nurture an environment that strives for and values collaboration. Engage new partners from diverse and varied backgrounds. Keep pace with the moving targets of new technologies and market opportunities. Develop policies to attract international talent, young entrepreneurs, and investors. Set clear goals and develop appropriate measures to track progress. Learn from, and be inspired by, the best.

As my colleagues Kai Engel, Violetka Dirlea, and Jochen Graff discuss in their new book, *Masters of Innovation,* even with the best ideas, speed and agility are paramount. Ever-shrinking innovation cycles pose a constant threat of falling behind, while complex decision structures can stall innovation. Effective strategies for combatting both must be woven into every new policy.

I would like to thank the GII team for their dedication and passion in their ongoing efforts to advance innovation—and we are delighted to be an active partner and regular contributor to this endeavour. We also remain committed to advancing innovation through our nonprofit subsidiary, IMP³rove – European Innovation Management Academy, which builds on our international experience, on a global network of IMP³rove-trained business advisors, and on the largest database on innovation management with close to 5,000 companies worldwide. We encourage you to participate and join us.

Finally, I encourage everyone to keep the conversation going—to reach across traditional boundaries and divides to support the policies that drive innovation, benefitting both our own communities and, more broadly, society at large.

Johan Aurik
Managing Partner and Chairman of the Board
A.T. Kearney

Leveraging Policies to Trigger Innovation

Innovation is gaining prominence in all kinds of economic activity around the world. Not only advanced economies but also developing nations are finding that innovation is one of the main drivers of economic growth. This renewed understanding of the significance of innovation is having a growing impact on the course of policy formulation in many countries.

A closer look suggests that developing nations are no longer lagging behind high-income ones in their efforts to introduce policies that will increase their innovation capacity. On the contrary, in many cases developing nations are taking the lead in embracing innovation to boost their industrial and economic growth.

Over the years the Global Innovation Index (GII) has measured the innovation capacity of nations across the world and presented a comparative analysis to help in understanding the variation in national competencies. The findings of the last five years of GII rankings in its innovation input and output pillars demonstrate that certain countries are consistently doing better than their peers in the same income and region categories. Although multiple factors are involved in this superior innovation performance, policy presents a major differentiating factor in the majority of cases.

This year the GII has taken steps to understand precisely how policy has been leveraged by some of the innovation achievers among the developing nations, allowing them to outperform their peers. This is an important aspect to study because it not only helps to inform the peer group of the best policy practices, but it also identifies gaps in policy that stagnate further growth prospects for the achiever.

This year India has been chosen as an example of an innovation achiever in Central and Southern Asia in the group of lower-middle-income countries. Chapter 8 in this report presents India as a representative innovation achiever by providing a narrative of how the country has shaped its innovation policy over the years and a perspective on what has worked for India and what not. The chapter also outlines lessons that can be useful for its peers in this area and considers ways that India can overcome its policy bottlenecks to become an innovation-driven nation.

The GII 2015 also includes insightful chapters from other innovation achievers among developing countries. These chapters analyse the evolution of innovation policy in these countries in more detail and try to establish a link between good business practices and smart innovation policies. They also provide information about how effective these policies have been in developing an environment that supports innovation in these countries.

As always, the GII team has been outstanding in its professionalism and approach to bring out this year's report, and I congratulate them for their consistency and dedication. The current edition will be a very useful reference for policy makers across the globe who wish to leverage the strengths of innovation for sustaining economic growth.

Chandrajit Banerjee
Director General
Confederation of Indian Industry

Government Policies: A Catalyst for a Nation's Innovation Growth

People have been innovating around the world for centuries—either inventing or challenging the status quo. Although inventions have been successful in silos or pockets, far-reaching and scalable innovation has most frequently occurred within organized and government-supported frameworks.

The United Arab Emirates (UAE) has always been a supporter of innovation, evidenced not only by the Burj Khalifa and other engineering marvels, but also by the country's high level of entrepreneurial ventures. A collaborative effort among public and private stakeholders is driving a move towards diversification where entrepreneurs and small- and medium-sized enterprises play a huge role, encouraging the entrepreneurial aspirations of UAE millennials.

Over the past years, the UAE's leaders have worked to diversify the country's economy and move into a new phase of growth. Their ambition of fostering innovation and knowledge-driven growth is clearly documented in the country's Vision 2021 national strategy. The pioneering Mars Mission is only one of the many examples showing that the UAE is on track to achieve its objectives.

With the rollout of the National Innovation Strategy in late 2014, the UAE government has provided a framework for innovation to flourish even further. This strategy underpins the government's ambition for Vision 2021 and is a concrete step to further long-term, creative, and sustainable gains rather than short-term wins.

It is this sort of cohesive and interconnected approach to innovation policies—with an emphasis on addressing grassroots issues—that may find resonance and success and that can truly contribute to the nation's development. This year's GII theme 'Effective Innovation Policies for Development' in particular underscores a great resource for helping to understand what policies have worked and how they can be implemented in different countries. The UAE, for instance, has recently introduced innovation policy in the education sector that aims at improving the technology standard in schools and universities to disrupt and rebuild the system with innovation as the driving force, nurturing the thought leaders of tomorrow.

We at du have long been advocates of change and innovation, and are extremely proud to be a partner to the government in achieving this ambition. Core to this position is the delivery of better, faster, and smarter communication solutions to ensure knowledge diffusion and seamless innovation. Our Smart City initiatives are paving the way with innovative digital solutions that will in turn enable innovation by the UAE's residents. We have a dream of connected innovation and are working hand in hand with national and international players to enjoy the benefits of a knowledge-based economy, powered by connectedness and mobility.

The *Global Innovation Index* report is a useful barometer on an economy's innovation performance, and provides tools that we, and every economy wanting to enhance its innovation capacity, can use.

Osman Sultan
Chief Executive Officer
du

Contributors to the Report

The Global Innovation Index 2015: Effective Innovation Policies for Development **was developed under the general direction of Francis GURRY (Director General,** World Intellectual Property Organization) and the editors of the report, **Soumitra DUTTA, Bruno LANVIN,** and **Sacha WUNSCH-VINCENT.**

The report was prepared and coordinated by a core team comprising:

CORE TEAM

Alexandra BERNARD, GII Project Manager, Samuel Curtis Johnson Graduate School of Management, Cornell University

Soumitra DUTTA, Anne and Elmer Lindseth Dean, Professor of Management, Samuel Curtis Johnson Graduate School of Management, Cornell University

Rafael ESCALONA REYNOSO, GII Lead Researcher, Samuel Curtis Johnson Graduate School of Management, Cornell University

Bruno LANVIN, Executive Director for Global Indices, INSEAD

Sacha WUNSCH-VINCENT, Senior Economist, Economics and Statistics Division, WIPO

The following persons and institutions have supported the production of the GII:

CO-PUBLISHERS

Cornell University

Carolyn P. O'KEEFE, Chief Marketing Officer, Charles and Janet Jarvie Executive Director of Marketing, Samuel Curtis Johnson Graduate School of Management, Cornell University

Shannon DORTCH, Communications Specialist, Social Media Manager, Samuel Curtis Johnson Graduate School of Management, Cornell University

INSEAD

Christine HIRZEL, Global Head, External Relations

Sophie BADRE, Associate Director, Media Relations

Chris HOWELLS, Editor, INSEAD Knowledge

Joe CHEDID, Associate Director, Communications & PR, Middle East

Aileen HUANG, Assistant Director, Media Relations, Asia

World Intellectual Property Organization (WIPO)

Carsten FINK, Chief Economist, Economics and Statistics Division

Francesca GUADAGNO, Economics Section

WIPO IP Statistics Section

WIPO Communications Division

WIPO Department of External Relations

WIPO Printing & Publication Production Section

KNOWLEDGE PARTNERS

Confederation of Indian Industry

Anjan DAS, Executive Director

Jibak DASGUPTA, Deputy Director

du

Luma BOURISLY, Vice President, Corporate Communications

Maryam AL BALOOSHI, PR Lead, Corporate

Svecchа KUMAR, Manager, Corporate Sustainability

Rashid AL AHMEDI, Senior Director, Special Projects and External Affairs

Yasmine ABDELAZIZ, Public Relations and Media Senior Specialist, Chief Executive Officer's Office

A.T. Kearney

Kai ENGEL, Partner

Violetka DIRLEA, Partner

Naveen MENON, Partner

Michael WEISS, Partner

Bob WILLEN, Partner

Branko ZIBRET, Partner

Mauricio ZUAZUA, Partner

Olivier GERGELE, Principal

Krzysztof JEDZINIAK, Manager

Bharat KAPOOR, Manager

Justin SHEPHERD, Manager

Akash MAYUR, Associate

David UHLENBROCK, SEA Marketing Coordinator

Anja VINTER, EMEA Marketing Coordinator

Jim BROWN, Marketing Director North America

IMP³rove – European Innovation Management Academy

Eva DIEDRICHS, Managing Director

Martin RUPPERT, Managing Director

(Continued on next page)

DIRECT COLLABORATORS

Antanina GARANASVILI, PhD candidate in Economics, University of Padova (former intern at the WIPO Economics and Statistics Division)

Michaela SAISANA, Composite Indicators (COIN) - Project Leader; and **Andrea SALTELLI,** Head of Unit, Econometrics and Applied Statistics Unit, Joint Research Centre of the European Commission

Hope STEELE, Editor, Steele Editorial Services

Neil WEINBERG, Principal, Neil Weinberg Design

DATA COLLABORATORS

We are also grateful to the following persons/institutions for their collaboration with specific data requests:

Mohsen BONAKDARPOUR, Managing Director; and **Scott FLEMING,** Director, IHS Economics

Alex CHISHOLM, Director, Statistical Analysis; and **Hillary CHAN,** Research Analysis Associate Manager, Graduate Management Admission Council (GMAC)

Thierry GEIGER, Senior Economist and Associate Director, and **Attilio Di Battista,** Quantitative Economist, Global Competitiveness and Risks, World Economic Forum (WEF)

Dong GUO, Statistician; and **Jürgen MUTH,** Statistical Assistant, Statistics Unit, Research, Statistics and Industrial Policy Branch, United Nations Industrial Development Organization (UNIDO)

Hector HERNÁNDEZ, Project leader – Innovation, Joint Research Centre, Institute for Prospective Technological Studies Unit Knowledge for Growth; and **Miguel QUEROL SUQUIA,** Information and Communication Officer – IPTS, Joint Research Centre, Communication Unit, European Commission

Derek HILL, National Center for Science and Engineering Statistics, National Science Foundation, United States of America

Élise LEGAULT, Programme Specialist, and **Chiao-Ling CHIEN,** Assistant Programme Specialist, Education Indicators and Data Analysis Section; **Lydia DELOUMEAUX,** Assistant Programme Specialist, and **Lisa BARBOSA,** Statistical Assistant, Culture Unit; **Martin SCHAAPER,** Programme Specialist, **Luciana MARINS** and **Rohan PATHIRAGE,** Assistant Programme Specialists, and **Zahia SALMI** and **Sirina KERIM-DIKENI,** Statistical Assistants, Science, Technology and Innovation Unit, all from the United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics (UIS)

Derek SLATER, Policy Manager; **Alex KOZAK,** Senior Policy Analyst, Google

Barbara D'ANDREA, Senior Statistician, and **Andreas MAURER,** Chief, International Trade Statistics Section; **Adelina MENDOZA,** Senior Statistical Officer, Market Access Intelligence Section; and **Joscelyn MAGDELEINE,** Statistical Officer, Trade in Services Section, all from the Economic Research and Statistics Division, World Trade Organization (WTO)

Ben SOWTER, Head of Division, QS Intelligence Unit, QS Quacquarelli Symonds Ltd

Theodoor SPARREBOOM, Senior Labour Economist; and **Alan WITTRUP,** Database System Developer, Department of Statistics, International Labour Office (ILO)

Petra STEINER, Key Account Manager, Bureau van Dijk Electronic Publishing GmbH

Susan TELTSCHER, Head; **Esperanza MAGPANTAY,** Senior Statistician; **Ivan VALLEJO,** Market Analyst; and **Nathalie DELMAS,** Assistant, at the ICT Data and Statistics Division (IDS), Telecommunication Development Bureau (BDT), International Telecommunication Union (ITU)

Matthew ZOOK, Professor at the University of Kentucky and President, ZookNIC Inc.

Energy Data Centre, headed by Jean-Yves Garnier, International Energy Agency (IEA)

United Nations Commodity Trade Statistics Database, Department of Economic and Social Affairs/Statistics Division, **http://comtrade.un.org/db/**

PwC Global entertainment and media outlook 2013-2017, **www.pwc.com/outlook**

Advisory Board to the Global Innovation Index

In 2011, an Advisory Board was set up to provide advice on the research underlying the Global Innovation Index (GII), generate synergies at its stages of development, and assist with the dissemination of its messages and results. The Advisory Board is a select group of leading international practitioners and experts with unique knowledge and skills in the realm of innovation. Its members, while coming from diverse geographical and institutional backgrounds (international organizations, the public sector, non-governmental organizations, business, and academia), participate in their personal capacity. We are grateful for the time and support provided by the Advisory Board members.

In 2015, we welcome five new members to the Advisory Board: Yuko Harayama, Hugo Hollanders, Beethika Khan, Mary O'Kane, and Houlin Zhao.

We would like to express our gratitude to Daniele Archibugi, Research Director at the Italian National Research Council; Robert Bell, former Program Director at the National Science Foundation of the United States of America; Lynn St. Amour, former President and Chief Executive Officer of the Internet Society; and Hamadoun Touré, former Secretary-General of the International Telecommunication Union, for their collective thoughtful contributions to the previous editions of the GII as members of the Advisory Board.

ADVISORY BOARD MEMBERS

Khalid S. AL-SULTAN
Rector, King Fahad University for Petroleum and Minerals, Saudi Arabia

Robert D. ATKINSON
President, The Information Technology and Innovation Foundation (ITIF), United States of America

Irina BOKOVA
Director General of the United Nations Educational, Scientific and Cultural Organization (UNESCO)

Dongmin CHEN
Professor/Dean, School of Innovation and Entrepreneurship and Director, Office of Business Development for Science and Technology, Peking University, China

Leonid GOKHBERG
First Vice-Rector, Higher School of Economics (HSE), and Director, HSE Institute for Statistical Studies and Economics of Knowledge, Russian Federation

Yuko HARAYAMA
Executive Member, Council for Science, Technology and Innovation, Cabinet Office, Government of Japan

Rolf-Dieter HEUER
Director General, European Organization for Nuclear Research (CERN)

Hugo HOLLANDERS
Senior Researcher, UNU-MERIT (Maastricht University)

Beethika KHAN
Program Director, National Science Foundation (NSF), United States of America

Raghunath Anant MASHELKAR
Bhatnagar Fellow, National Chemical Laboratory, Council of Scientific and Industrial Research (CSIR); Chairperson, National Innovation Foundation; and President, Global Research Alliance, India

Diego MOLANO VEGA
Former Minister, Information Technologies and Communications, Colombia

Mary O'KANE
Professor, NSW Chief Scientist and Engineer, Australia

Sibusiso SIBISI
President and Chief Executive Officer, Council for Scientific and Industrial Research (CSIR), South Africa

Rob STEELE
Secretary-General, International Organization for Standardization (ISO)

Houlin ZHAO
Secretary-General, International Telecommunication Union (ITU)

Executive Summary

The Global Innovation Index (GII) 2015 covers 141 economies around the world and uses 79 indicators across a range of themes. Thus GII 2015 presents us with a rich dataset to identify and analyse global innovation trends. The theme for this year's GII is 'Effective Innovation Policies for Development'. Taking advantage of the wealth of information produced by the GII analysis in its past editions, the outcome of various innovation policies can be reviewed to support their claims to effectiveness and to determine the impact that an economy's degree of development has on their efficacy.

This report presents chapters that discuss different aspects of the index and the theme, followed by appendices that provide a profile for each of the countries/economies covered this year, the data from individual data tables for each indicator, detailed information about the sources and definitions of each indicator, and technical notes about the composition of the index.

Below we provide a summary of the chapters.

Chapter 1, 'The Global Innovation Index 2015: Effective Innovation Policies for Development', written by Soumitra Dutta, Rafael Escalona Reynoso, and Alexandra L. Bernard from Cornell University; Bruno Lanvin from INSEAD; and Sacha Wunsch-Vincent from WIPO, introduces the idea that innovation-driven growth is no longer the prerogative of high-income countries alone, while providing tangible examples of effective innovation policies undertaken by developing countries with corresponding positive results in the GII rankings. Furthermore, this chapter discusses the results of this year's rankings. The key findings from the chapter are summarized below:

- Switzerland, the United Kingdom (UK), Sweden, the Netherlands, and the United States of America (USA) are the world's five most-innovative nations; at the same time, China, Malaysia, Viet Nam, India, Jordan, Kenya, Uganda, and a group of other countries are outpacing their economic peers in 2015.
- The GII leaders have created well-linked innovation ecosystems where investments in human capital, combined with strong innovation infrastructures, contribute to high levels of creativity. In particular, the top 25 countries in the GII consistently score well in most indicators and have strengths in areas such as information and communication technologies and business sophistication, which includes knowledge workers, innovation linkages, and knowledge absorption; they also create high levels of measurable outputs including creative goods and services.
- But innovation is not only about volume: Quality counts, too. In terms of innovation quality—as measured by university performance, the reach of scholarly articles, and the international dimension of patent applications—the USA holds the top place within the high-income group, followed by the UK, Japan, Germany, and Switzerland. Top-scoring middle-income economies are narrowing the gap on innovation quality: China leads this group, followed by Brazil and India, fuelled by an improvement in the quality of higher-education institutions.
- The GII 2015 confirms the persistence of global innovation divides. Among the top 10 and top 25, rankings have changed but the set of economies remains unaltered (the only exceptions being the Czech Republic, which has made its way into the top 25, and Malta, which has dropped from this list).
- For the purposes of this report, economies that perform at least 10 percent better than their peers for their level of gross domestic product (GDP) are called 'innovation achievers'.
- The 14 middle-income countries outperforming others in their income group—in order of performance—are the Republic of Moldova,

China, Viet Nam, Armenia, Senegal, Mongolia, Malaysia, Montenegro, Ukraine, India, Bulgaria, Thailand, Morocco, and Jordan. The eight low-income countries outperforming others in their income group are Malawi, Mozambique, Rwanda, Kenya, Mali, Burkina Faso, Cambodia, and Uganda. These innovation achievers demonstrate rising levels of innovation input and output results because of improvements made to institutional frameworks, a skilled labour force with expanded tertiary education, better innovation infrastructures, a deeper integration with global credit investment and trade markets, and a sophisticated business community—even if progress on these dimensions is not uniform across their economies.

- On average, the technology gap between developing and developed countries is narrowing. One explanation for this phenomenon is that more and more developing countries outperform in innovation inputs and outputs relative to their level of development. The GII 2015 studies these 'outperformers'—namely Armenia, China, Georgia, India, Jordan, Kenya, Malaysia, the Republic of Moldova, Mongolia, Uganda, and Viet Nam—analysing them in more detail and establishing links between performance and good business practices or innovation policies. They and other countries have realized that technology adoption alone is no longer sufficient to maintain a high-growth scenario; rather, investment in innovation is now crucial to spur further catch-up. As a result, national innovation policy programmes and the corresponding institutional arrangements have flourished in low- and middle-income countries.
- The top three economies in the GII rankings for each region are as follows: in Sub-Saharan Africa, the top three are Mauritius, South Africa, and Senegal; in Central and Southern Asia, these are India, Kazakhstan, and Sri Lanka; in Latin America and the Caribbean, these are Chile, Costa Rica, and Mexico; in Northern Africa and Western Asia, these are Israel, Cyprus, and Saudi Arabia; in Southeast Asia and Oceania, these are Singapore, Hong Kong (China), and the Republic of Korea; in Europe, these are Switzerland, the UK, and Sweden; in Northern America, there are only two—the USA and Canada.
- Encouraging signs continue to emerge in Sub-Saharan Africa. Following the trend identified in the GII last year, driven by selected countries, the Sub-Saharan Africa region has caught up significantly. In addition to South Africa, some African countries—in particular, Burkina Faso, Kenya, Malawi, Rwanda, and Senegal—stand out for having made important progress.
- Although Latin America and the Caribbean region's GII rankings have been slow to improve, Brazil, Argentina, and Mexico stand out as economies performing above the region's average GII score. The consistent overperformance of Chile, Costa Rica, and Colombia—in both regional terms and as compared to their peers of similar economic development—is also noteworthy, as is the emergent role of Peru and Uruguay.

Chapter 2, 'Benchmarking Innovation Outperformance at the Global and County Levels', written by Rafael Escalona Reynoso and Alexandra L. Bernard from Cornell University; Michaela Saisana from the Joint Research Centre at the European Commission; Martin Schaaper from UNESCO Institute for Statistics; and Sacha Wunsch-Vincent and Francesca Guadagno from WIPO, assesses the list of innovation achievers and pillar outperformers over the period 2011–14 and identifies a select group of 11 innovation outperformer economies. The chapter stresses that, at the country level—especially in developing countries—the emphasis on fostering innovation has increased and national innovation policies and programmes are flourishing.

- Although tracking absolute levels of innovation over time is difficult, measuring such progress has become a priority for policy makers who are seeking ways to assess the effectiveness of their innovation policies and innovation systems. This interest has also been permeated by high-level international development-related discussions.
- By tracking global progress in innovation and focusing on those developing countries that outperform in innovation compared to countries at similar levels of development, the GII can be used to monitor progress in innovation and identify areas of strengths and weaknesses in innovation efforts.
- The analysis within the chapter finds a growing percentage of countries with above-par performance (those that outperform their peers with a similar

level of economic development). The number of these innovation achievers continues to increase through the period under study here, namely 2011–14.

- Eight economies (China, India, Jordan, Kenya, the Republic of Moldova, Mongolia, Malaysia, and Viet Nam) can be signalled as innovation achievers, outperforming their peers on the overall GII score during 2011–14.
- Fifteen economies (China, Costa Rica, Georgia, Ghana, Hungary, India, Kenya, the Republic of Moldova, Mongolia, Malaysia, Rwanda, Serbia, Thailand, Ukraine, and Viet Nam) outperformed their peers in at least four innovation input or output pillars during 2011–14.
- Eleven developing countries (Armenia, China, Georgia, India, Jordan, Kenya, Malaysia, the Republic of Moldova, Mongolia, Uganda, and Viet Nam) are labelled 'innovation outperformers' because they conform to the following two more stringent rules: (1) their GII score relative to their GDP is significantly higher than it is for other economies (they attain 'innovation achiever' status) for two or more recent years (including at least 2013 and 2014); and (2) they outperform their income-group peers in a minimum of four innovation input or output pillars (they are designated 'pillar outperformers') for two or more years (including at least 2013 and 2014).
- Innovation achievers seem to perform the strongest in Market sophistication and Knowledge and technology outputs. At low income levels, countries that outperform their peers focus on removing structural obstacles to innovation, such as poor access to finance and poor linkages within the innovation systems. At higher income levels, efforts concentrate on increasing investments, spurring growth in innovation outputs, and improving human capital.
- Although the innovation system literature puts great emphasis on the role of human capital and institutions for innovation and development, these innovation input factors seem to be the most difficult of all inputs in which to achieve good scores, both in general and for low-income countries in particular. These results do not necessarily imply a lack of policy interest in these areas, but they might suggest that it is easier to outperform peers in certain inputs, either because efforts to improve these inputs bring more immediate benefits or because peer countries perform particularly poorly in these areas.
- Research and development (R&D) is one of the key policy areas that can secure technological potential and, therefore, innovation and economic growth. In order to reach the income levels of high-income countries, low- and middle-income countries need to expand their access to technology and their capacity to use it.
- Countries at higher income levels, instead, can benefit from more developed innovation systems, where education and research can effectively provide the knowledge and skills to boost innovation. This allows them to more effectively translate innovation efforts into knowledge and technology outputs.

Chapter 3, 'Innovation Policies for Development,' written by Micheline Goedhuys, Hugo Hollanders, and Pierre Mohnen from UNU-MERIT (United Nations University and Maastricht University), emphasizes that the competitiveness of both companies and countries depends on their ability to innovate and move in the direction of frontier technology and knowledge. Innovation policies have been recently introduced in most emerging economies. Even in developing and least-developed countries, innovation is at the core of the political debate, but the focus of innovation policies in these countries differs from that of policies in more advanced economies.

- There is a wide heterogeneity among enterprises in emerging economies. Besides top-performing companies, emerging economies also host large groups of micro and small businesses, operating far below the frontier of innovation, with basic technologies and low levels of human capital. Raising the productivity of these smaller producers through innovation and the adoption of better technologies will have a substantial aggregate impact on a country's economic growth, employment, poverty alleviation, and sustainable development.
- At the aggregate level and in comparison with data from developed economies, innovation in developing countries is more incremental than radical and takes place in an informal setting more often than it does in formal R&D laboratories.

- For emerging countries that are catching up, experience shows that technology adoption alone is no longer sufficient to maintain a high-growth scenario. These countries too must invest in innovation, and governmental support is crucial for promoting it.
- In developing and emerging economies, the importance of innovation is widely recognized and innovation policies occupy a central role in their development plans and strategies.
- In emerging countries, innovation is seen as key to addressing pressing societal problems such as pollution, health issues, poverty, and unemployment. The role and significance of innovation goes beyond the objective of economic success. Rather it should be seen through the lens of inclusive development because it can address poverty and health issues, and through the lens of environmental sustainable development because it can address problems of pollution and energy provision.
- Since innovation processes are also more oriented towards knowledge diffusion and absorption, instead of investing in R&D, to a large extent firms in emerging economies try to reap the benefits of catching up through adoption and international technology transfer, and favour tax incentives over direct R&D support grants.
- Emphasis in emerging countries should be placed on gaining knowledge as much as on providing the right framework conditions that stimulate a process of innovation and knowledge diffusion: political stability and supportive institutions; good and widespread technical and tertiary education to enhance absorptive capacity; reliable and widespread basic infrastructure; excellent provision of information and communication technology (ICT) property rights; and stronger links and interaction between publicly funded research institutes and private companies.
- The ultimate policy mix will depend on a country's broader development objectives, and will have to be made in collaboration with all the stakeholders to maximize the chances of success. Good coordination between ministries and between the private and the government sectors is therefore essential.
- It is also essential to monitor the impact of innovation policies in order to determine whether policies have worked and which policies might be most effective.
- Countries need to invest in research and innovation to develop products that address their particular needs. Governments are therefore developing innovation-support policies that take into account the specificities of their domestic industries. A few emerging countries have successfully introduced such policies and provide interesting cases from which lessons can be learned on a diverse range of innovation policies.

Chapter 4, 'Principles for National Innovation Success,' written by Robert D. Atkinson and Stephen Ezell from the Information Technology and Innovation Foundation, discusses the growing recognition that innovation is something in which all nations, including developed and developing, can, and indeed should, be engaged. The chapter presents six key principles all nations need to consider in order to design and implement the most effective innovation policies:

- Principle 1: Innovation policy should focus on maximizing innovation in all industries. Although manufacturing generally, and high-tech manufacturing specifically, is an important component of innovation, maximizing innovation requires maximizing innovation across all industries.
- Principle 2: Innovation policy should support all types and phases of innovation. One of the biggest mistakes countries make with their innovation strategies is to define innovation too narrowly, focusing mainly on developing and manufacturing high-tech products. Countries should focus more on across-the-board productivity growth strategies than on trying to grow primarily by shifting the compositional mix of their economy from lower- to higher-value-added sectors.
- Principle 3: Enable churn and creative destruction. To succeed in innovation, nations need to do more than merely enable some value-added innovation to supplement what is already going on in other, leading economies. They need to enable disruptive innovation, which is often generated by new market entrants, especially those emerging in their own economies.

- Principle 4: Keep the price of capital goods imports, especially information and communications technology (ICT) imports, low. Without new capital investment refreshing a nation's capital stock, innovation loses its power, productivity growth stagnates, and business competitiveness declines. The easiest and most important way countries can keep the cost of capital goods low is to limit tariffs and other trade barriers.
  - » ICTs represent a general purpose technology that are a foundational driver of modern economic growth, accounting themselves for as much as one-quarter of economic growth in many developing nations today.
  - » Although many nations impose high taxes and tariffs on ICT products in an attempt to either boost government revenue or to create a competitive domestic ICT industry or both, many nations—including China, Georgia, Malaysia, and Viet Nam—do a reasonably good job of limiting government-imposed costs on ICT products.
- Principle 5: Support the creation of key innovation inputs. Firms not only need access to best-in-class, affordable ICT inputs, they also need access to other key innovation inputs, including digital infrastructure, a skilled workforce, and knowledge—both its production and its transfer. Examples of such support include:
  - » Kenya's National ICT Master Plan 2013/14–2017/18, introduced in April 2014, has played a vital role in developing a strategy to comprehensively deploy digital infrastructure, notably wireless and broadband Internet, throughout Kenya and to complement that availability of infrastructure with demand for it generated by popular applications such as mobile money and mobile government services.
  - » Countries increasingly recognize talent as a vital source of competitive advantage and thus have made education and training a core component of their innovation strategies.
  - » Because entrepreneurship is so risky and often involves first-time entrepreneurs, initiatives to help entrepreneurs learn from each other can be critical.
- Principle 6: Develop a national innovation and productivity strategy and organizations to support it. In addition to national strategies, many successful nations have also established national innovation agencies specifically dedicated to spurring domestic innovation.
  - » For example, Kenya, India, Malaysia, Thailand, and Viet Nam have each established a National Innovation Agency.
  - » National innovation foundations also create national innovation strategies that constitute a game plan for how their countries can compete and win in a modern, innovation-based global economy. For instance, Kenya's National Science, Technology and Innovation Policy underscores the importance of mainstreaming science, technology, and innovation across all sectors of the economy.

The chapter concludes:

- Countries attempting to achieve national innovation success need to envision a four-level pyramid as the path to prosperity that is based on key framework conditions; these support an effective tax, trade, and investment environment; these in turn support key factor inputs; and finally, at the top of the pyramid, is a group of innovation and productivity policies.
- Countries must think holistically about how a wide variety of public policies impact the ability of their enterprises and industries to compete in the increasingly innovation-based global economy.

Chapter 5, 'Innovation and Policy: A Business Perspective,' written by Kai Engel and Justin Shepherd from A.T. Kearney and Martin Ruppert from the IMP³rove – European Innovation Management Academy, presents the findings of a survey of over 400 business leaders across several different countries to provide a business perspective on innovation policies. The results are as follows:

- Managers were generally positive and confident when evaluating their own innovation capabilities. Over half of those surveyed rated their performance as 'excellent' or 'very good' across all areas.

- Delivering radical innovation and collaborating with external partners were the two areas where companies saw the greatest need for improvement.
- Eighty percent of respondents answered that conditions in their countries permit them to pursue strategic objectives for innovation. This outcome suggests that policy environments are currently broadly supportive of innovation.
- The responses also reflected the need for policy makers to maintain a forward-looking orientation and to create policy frameworks that will support innovation in the future, not only in the present.
- More than 60% of survey respondents consider policy measures to be 'important' or 'highly important' to support different models of internal or collaborative innovation.
- Sixty-nine percent of survey respondents see policy measures to support internal innovation models as having either 'high' or 'very high' importance. By generating an increasingly complex innovation environment, current mega trends—such as digitization and connectivity—will make policy supports even more vital.
- When asked about future policy needs to support innovation, respondents suggested adopting forward-thinking legislation to ensure sustainability in the innovation environment; providing market participants with the tools to anticipate regulation; and improving regulatory harmonization to ensure smooth implementation into the international marketplace.
- Survey participants were further asked to name up to three specific actions that would develop enhanced conditions for innovation in their country: (1) to enhance innovation and entrepreneurship-related skills, (2) to provide large R&D infrastructure support (e.g., lab space and equipment), and (3) to provide direct financial R&D support. These priorities reflect the findings of the GII 2014, which indicated room for improvement in Human capital and Market sophistication–related factors such as access to finance, innovation linkages, and infrastructure.
- Encouraging policy that supports the development of an environment in which innovation can thrive should be a focus of efforts from the business community.

Chapter 6, 'The Impact of Science and Technology Policies on Rapid Economic Development in China,' written by Dongmin Chen, Shilin Zheng, and Lei Guo from Peking University, details how science and technology (S&T) policy reform and innovation have been the important drivers for China's remarkable GDP achievement and have accelerated progress in higher education and research and development (R&D):

- A Medium- and Long-Term National S&T Development Plan for 2006–2020 (the 2006 National Plan) was issued in 2006. The plan emphasizes achieving sustainable economic growth, seeking innovation-driven growth strategies, and further enhancing independent innovation capacity. Objectives of national policies shifted from promoting R&D to building an innovation ecosystem.
- Following the 2006 National Plan, Chinese R&D investment clearly stepped up and the rate of local government investment in R&D surpassed that of the central government. Moreover, the positive market response encouraged the industrial sector to steadily increase R&D investment.
- To further push talent mobility, particularly in critical S&T fields, a very effective Thousand Talents Recruitment Program was launched by the central government. This has so far drawn more than 2,000 overseas Chinese scholars and leading industrial innovators back to China.
- The wide range of S&T policies implemented and adjusted over the past three decades has effectively advanced the development of an innovation ecosystem, as well as significantly increasing the size of the educated workforce, laying out a solid foundation for China's future development.
- The strategy of 'rejuvenating the nation's economy with science and education' has accelerated the development of China's top education system, increased the quantity of undergraduates and Master's graduates, and increased investment in talented researchers, leading to an increase of both the quality and quantity of researchers.
- Over the last two years, the Chinese government issued the 2014–2020 Action Plan on the Implementation of National Intellectual Property Strategy to ease the market processes for transactions pertaining to intellectual properties. It has

also overhauled the entire S&T funding processes to improve efficiency, launched a special stock market to allow technology start-up companies to have more avenues through which to raise development capital, and published *A Guideline for the Development of Public Incubation Space* to promote grassroots entrepreneurship to encourage the participation of multi-level capital markets, including crowdfunding.

- China has set a national target of becoming a leading innovative country by 2020. Reaching this target depends on continuing policy reform to further improve a balanced relationship between the government and market forces; to establish a more comprehensive innovation ecosystem; to nurture a legal and regulatory system that encourages investment in innovation and entrepreneurship by all sectors; and to foster open and fair competition among private, state-owned, and foreign enterprises.

Chapter 7, 'Radical Institutional Change: Enabling the Transformation of Georgia´s Innovation System', written by Cristina Chaminade and Maria Moskovko from CIRCLE, Lund University, discusses the key institutional changes that are enabling Georgia to drive a rapid and positive change in its innovation performance.

- Since the collapse of the Soviet Union, Georgia has undertaken a process of deep transformation of its institutional framework enabled by the Association Agreement with the European Union. These reforms have improved tax administration and reduced corruption, progress that explains its exceptional performance in the GII rankings in Institutions and the significant increase of foreign direct investment inflows. The institutional change has led to a sizeable improvement in its innovation system. Further institutional change is necessary, however, to strengthen its education and research systems and improve firms' capabilities.
- Soft institutions, represented by societal practices, are harder to change. Intellectual property rights (IPR) protection is one of the areas in which soft institutions are making it difficult to implement new formal institutions.
- Despite the overall good performance in Human capital and research, Georgia is still facing the challenge of a fragmented research system and the loss of researchers who left the country after the collapse of the Soviet Union. To solve these issues, the Georgian government has increased salaries for researchers, offered incentives to high-skilled Georgians who return to the country, and reformed the education system to bring it closer to the European standard.
- The Georgian business sector suffers from low capitalization, lack of training, low levels of patenting activity, and low levels of knowledge-intensive industries, which are reflected in its low levels of intangible assets and a poor use of ICTs, which severely hampers innovation capacity. The business sector is also poorly linked to university and research organizations. Investments in firms' innovation capabilities are needed—a major challenge for countries with very limited resources.
- The Association Agreement with the European Union (signed in 2014) could become a way to address some of the weaknesses outlined above. The agreement covers a large number of sectors and policy areas, including education, research and technological development, and ICT development. Moreover, access to the European market is expected to increase firms' incentives to be competitive.
- Links to multinational corporations are very important, but they need time and absorptive capacity to develop. Intermediate organizations such as non-governmental organizations and measuring and testing centres can play a crucial role in translating the knowledge of multinational corporations to the local actors.
- Especially given the current unstable situation in Eastern Europe and other external factors, it is essential for its continued development that Georgia stay on course on the innovation policy front.

Chapter 8, 'Policies to Drive Innovation in India,' written by Senapathy 'Kris' Gopalakrishnan and Jibak Dasgupta from the Confederation of Indian Industry, discusses the innovation performance of India, highlighting the strengths and weaknesses of its innovation system and the government interventions associated with them. Despite its achievements, especially in its scientific base and information technology (IT) and telecommunications industries, India still needs to implement substantial reforms in its innovation policy in order to further improve its innovation performance.

- India has consistently performed poorly during the last four years in political stability, ease of starting a business, tertiary inbound mobility, and environmental performance.
- Over the years, India has developed a stable foundation for scientific, technological, and business education by setting up centres of excellence. This contributed to its 66% average growth rate in scientific publications over the period 2006–10.
- The National Telecom Policy of 1994 and subsequent policy on broadband in 2004 lay the foundation for the rise of the Indian IT and telecommunications (mobile) industry. The National Telecom policy and IT Policy of 2012 is expected to further accelerate the growth of this industry by encouraging innovation and R&D in cutting-edge technologies, provide benefits to small- and medium-sized enterprises (SMEs) and start-ups, create a pool of 10 million skilled workers, and make at least one individual in every household e-literate.
- The SME sector has a high growth potential. This potential, however, has not yet materialized because of low credit availability. Government intervention in this area has focused on cluster development through various schemes and programmes of the Ministry of Micro, Small & Medium Enterprises and the National Innovation Council. Despite these efforts, SME cluster development in India is still not satisfactory.
- The Indian IPR regime has been crafted to strike a balance between protecting IPRs to support the commercialization of innovation and catering to social needs. This resulted in a relatively weaker IPR regime and a lower propensity to filing patents in India.
- With a population of more than 1.2 billion, and with 50% of that population under the age of 25, India faces a huge demand for higher education. This problem is exacerbated by low teacher quality, constraints in research capacity, and huge socioeconomic disparities.
- Despite their success, the Indian IT and telecommunications industries could contribute even more to economic growth and development in the country. For this to happen, higher education, IPR, institutional reforms, regulatory environment, infrastructure, and incentives for entrepreneurship and R&D (especially for SMEs) should receive increased support of the government.
- As a partial response to these challenges, the newly elected government established a Ministry for Skill Development and Entrepreneurship, created financial schemes for SMEs and incubation programmes for start-ups, launched Intellectual Property Facilitation Centres to spread an intellectual property culture within SMEs, and announced increased expenditures on infrastructure.

Chapter 9, 'Effective Innovation Policies for Development: The Case of Kenya', written by Bitange Ndemo from the University of Nairobi, discusses how Kenya improved its innovation performance thanks to local innovators and a long R&D history in some key sectors, such as agriculture and health care. However, this rapid increase in new innovations is not strictly associated with the innovation policies in place in the country. These, therefore, need to improve to stimulate further innovation by guaranteeing stability and adequacy of funds for innovation, strengthening linkages between all the actors of the innovation system, and better communicating government plans to firms and innovation actors. The chapter explains:

- Pressure from a rapidly growing population, scarcity of resources, and soaring unemployment are driving the Kenyan government to push innovation as a new source of jobs. Successful commercialization of locally developed innovations has led to increased understanding of its potential to create employment and deal with local problems. Multinational corporations are also setting up research facilities in Kenya to get closer to this new potential market.
- Relative to other African countries, some of Kenya's strengths lie in its governance system and political stability as well as its levels of expenditures on education and R&D, access to credit, microfinance gross loans, royalty and fees receipts, and intensity of local competition.
- Innovations in the financial sector (e.g., the diffusion of mobile banking) facilitate access to credit and explain the improvements in market and business sophistication.
- Since 2006 the government has created a number of ministries and organizations to stimulate human capital development, R&D

expenditures, and improve science and technology infrastructures.

- An emphasis was also placed on pursuing more and better collaborations and partnerships and encouraging entrepreneurship through start-up and accelerator programmes, incubation, and the creation of a technology park.
- Despite the existence of a policy framework, challenges hindering the adoption of innovation as a key driver of economic growth still exist. As a consequence, resource allocation to R&D is often not guaranteed and the little that is allocated to research organizations is spent on recurrent expenditures.
- Actors within the innovation system are still weakly linked, leading to capacity underutilization, disconnection between industry and research organizations, and obstacles to innovate for SMEs.
- In terms of future challenges, the education system needs to place more emphasis on science, technology, engineering, and mathematics (STEM); create more technical, industrial and vocational education training institutions; and move to business-friendly educational programmes. These issues are currently being tackled by creating a number of institutions. This proliferation of institutions, however, is not expected to solve these issues.
- The chapter also views lessons for Kenya from other countries. The USA has much to offer in its new approach to building a community of innovators—the TechShop concept—which is being explored through a collaboration between the University of Nairobi and MIT. The chapter then takes a look at an approach to encouraging start-up creation and SME growth from the Republic of Korea, which begins in reforms to the education system, coupled with military service. Together these may foster a culture of risk-taking and innovation, and may be a useful model for Kenya to consider.

Chapter 10, 'Innovation Performance of the Malaysian Economy', written by Rajah Rasiah and Xiao-Shan Yap from the University of Malaya, details how Malaysia offers an excellent example of a middle-income country that has done well in areas such as business financing of innovation and commercialization as well as in Market sophistication and Business sophistication, but at the same time still has considerable progress yet to make in areas such as knowledge-based activities and technological dependence. The chapter details:

- Despite strong commercialization in business R&D, including in business financing, the country's relatively poor performance in innovation efficiency shows a need to review government policies on the execution of government-sponsored R&D funds.
- Government support of innovation in Malaysia is primarily through science, technology, and innovation policies (STI) that began in the 1980s. The Ministry of Science, Technology and Innovation (MOSTI) supports the creation, research, development, and commercialization of innovative activities in Malaysia.
- After 2006, following efforts by the government to stimulate R&D in the country, the number of projects approved and the amounts involved rose. Stimulating R&D is viewed as key to making Malaysia a developed country by 2020.
- The Intensification of Research in Priority Areas grant was launched in 1988 under MOSTI, which was targeted at government organizations such as universities and public research institutes to stimulate research. At the same time, the government introduced the double deduction tax incentive for firms undertaking approved R&D. The Industrial R&D Grant Scheme to support R&D in the private sector was introduced in 1997.
- The increasing focus by the government on research funding has helped stimulate expansion in innovation input and output, as can be seen from the rise in R&D expenditure as a share of GDP, R&D researchers and scientists per million persons, and the output of doctoral graduates and scientific publications. Both the leadership at MOSTI and the National Science Research Council have systematically tried to address the fundamental aspects of targeting expenditure to the priority areas that can best generate innovation.
- Since the promotion of export-oriented industrialization from 1971, high-tech production has become a major pillar of manufacturing in Malaysia. Strong basic infrastructure

and consistent promotion incentives that are well coordinated by the Malaysian Industrial Development Authority have ensured that foreign capital continues to remain in Malaysia to assemble and test electronics products for the export market.

- Recognizing that private R&D cannot be a substitute for government funding—especially where the benefits share strong public goods characteristics—in 2010 the government increased R&D expenditure with a focus on increasing R&D scientists and engineers, commercialization, the filing of intellectual property, scientific publications, and postgraduates, and began to emphasize innovation through substantially improved products and processes.
- The Malaysian government has managed to expand scientific input and output through the coordination of MOSTI with the meso-organizations of the Malaysia Industry-Government Group for High Technology, the Multimedia Development Corporation, the Malaysian Technology Development Corporation, the National Science Research Council and the five research universities: Universiti Malaya, Universiti Kebangsaan Malaysia, Universiti Sains Malaysia, University Putra Malaysia, and Universiti Teknologi Malaysia.
- The chronic deficit in royalty and licensing fee receipts and payments demonstrates that Malaysia still relies heavily on foreign technology and services. Policies are needed to transform Malaysia from a technology-importing to a technology-exporting country.
- In 2012 the Collaborative Research in Engineering, Science & Technology (CREST) was established to drive growth in the electrical-electronics industry, focusing on bringing together the three key stakeholders (industry, academia, and the government) in collaborative R&D, talent development, and commercialization. Because each research project granted by CREST conditions the participation of both universities and industrial firms, it is directly targeted at building university-industry linkages in the country.
- The main shortcomings that have restricted Malaysia's GII ranking from rising above 33rd place relate to the efficiency of the innovation inputs and outputs. As a consequence Malaysia has remained a net technology and services importer with net receipts and licensing fees remaining negative for many years. There should be greater effort made to improve institutional support and knowledge-based activities and turn Malaysia into a net exporter of technology and services.

Chapter 11, 'Effective Innovation Policies for Development: Uganda', written by Julius Ecuru from the Uganda National Council for Science and Technology and Dick Kawooya from the University of South Carolina, School of Library and Information Science, discusses the case of Uganda and how it has changed dramatically in both economic terms and in other areas as a result of its relative political and economic stability. Uganda's rapidly growing population requires simultaneously expanding the economy to accommodate the people's needs and adopting more sustainable practices in natural resource management. For this reason, Uganda should turn to innovation and the creative use of resources across all sectors of the economy in order to build a sustainable future. The chapter explains:

- The Uganda government is deepening private-sector investment by improving its business environment and competitiveness through innovation.
- Uganda's GII strength in areas such as strong foreign direct investment net inflows is a direct result of the relative stability of the economy.
- Innovations in agro-processing and value addition may be essential for creating new sources of growth and agribusiness.
- The new Ministry of Education, Science, Technology, and Sports is a consequence of policy discussions over the last decade that identified a need for a standalone ministry for science and technology.
- Universities and other research organizations need to have internal policies that address and encourage research and intellectual property management.
- Uganda has a solid institutional foundation for developing the private sector. However, the private sector must be competitive domestically and internationally.
- Implementing the Uganda Registration Services Bureau's Strategic Investment Plan for 2012–17

may remove institutional bottlenecks involved in business registration, which in turn would improve Uganda's current low score on the ease of starting and cost of running a business.

- One important dimension of innovation in Uganda is its learning-by-doing aspect, especially in the informal sector, which constitutes about two-thirds of the country's businesses.
- To foster productivity in the informal sector, efforts have been made to improve the skills of youth and women so they can either start or improve their businesses.
- The rapid growth of universities in the country is an opportunity to harness young talent by supporting creative work, research, and innovation.
- Streamlining the financing policy for research and innovation is a vital next step.
- Creating new businesses through active business incubation should be pursued.
- Government's sustained support and commitment to research and innovation activities in universities, research institutes, and other centres is needed through direct as well as annual competitive grants.
- Uganda's experiences provide lessons that can be valuable for other low-income countries that need to improve their ranking in the GII. The most important lesson is that policy formulation and institutional capacity development around STI must be addressed concurrently. Strong leadership can also provide an essential component of successful progress in bridging the gap between research and innovation centres and industry.

Rankings

Global Innovation Index rankings

Country/Economy	Score (0–100)	Rank	Income	Rank	Region	Rank	Efficiency Ratio	Rank	Median: 0.71
Switzerland	68.30	1	HI	1	EUR	1	1.01	2	
United Kingdom	62.42	2	HI	2	EUR	2	0.86	18	
Sweden	62.40	3	HI	3	EUR	3	0.86	16	
Netherlands	61.58	4	HI	4	EUR	4	0.92	8	
United States of America	60.10	5	HI	5	NAC	1	0.79	33	
Finland	59.97	6	HI	6	EUR	5	0.77	41	
Singapore	59.36	7	HI	7	SEAO	1	0.65	100	
Ireland	59.13	8	HI	8	EUR	6	0.88	12	
Luxembourg	59.02	9	HI	9	EUR	7	1.00	3	
Denmark	57.70	10	HI	10	EUR	8	0.75	49	
Hong Kong (China)	57.23	11	HI	11	SEAO	2	0.69	76	
Germany	57.05	12	HI	12	EUR	9	0.87	13	
Iceland	57.02	13	HI	13	EUR	10	0.98	4	
Korea, Republic of	56.26	14	HI	14	SEAO	3	0.80	27	
New Zealand	55.92	15	HI	15	SEAO	4	0.77	40	
Canada	55.73	16	HI	16	NAC	2	0.71	70	
Australia	55.22	17	HI	17	SEAO	5	0.70	72	
Austria	54.07	18	HI	18	EUR	11	0.77	37	
Japan	53.97	19	HI	19	SEAO	6	0.69	78	
Norway	53.80	20	HI	20	EUR	12	0.73	63	
France	53.59	21	HI	21	EUR	13	0.75	51	
Israel	53.54	22	HI	22	NAWA	1	0.83	20	
Estonia	52.81	23	HI	23	EUR	14	0.86	17	
Czech Republic	51.32	24	HI	24	EUR	15	0.89	11	
Belgium	50.91	25	HI	25	EUR	16	0.74	59	
Malta	50.48	26	HI	26	EUR	17	0.95	7	
Spain	49.07	27	HI	27	EUR	18	0.72	67	
Slovenia	48.49	28	HI	28	EUR	19	0.82	22	
China	47.47	29	UM	1	SEAO	7	0.96	6	
Portugal	46.61	30	HI	29	EUR	20	0.73	62	
Italy	46.40	31	HI	30	EUR	21	0.74	57	
Malaysia	45.98	32	UM	2	SEAO	8	0.74	56	
Latvia	45.51	33	HI	31	EUR	22	0.81	26	
Cyprus	43.51	34	HI	32	NAWA	2	0.66	90	
Hungary	43.00	35	UM	3	EUR	23	0.78	35	
Slovakia	42.99	36	HI	33	EUR	24	0.76	48	
Barbados	42.47	37	HI	34	LCN	1	0.81	25	
Lithuania	42.26	38	HI	35	EUR	25	0.70	74	
Bulgaria	42.16	39	UM	4	EUR	26	0.83	21	
Croatia	41.70	40	HI	36	EUR	27	0.75	50	
Montenegro	41.23	41	UM	5	EUR	28	0.79	29	
Chile	41.20	42	HI	37	LCN	2	0.68	82	
Saudi Arabia	40.65	43	HI	38	NAWA	3	0.72	69	
Moldova, Republic of	40.53	44	LM	1	EUR	29	0.98	5	
Greece	40.28	45	HI	39	EUR	30	0.65	98	
Poland	40.16	46	HI	40	EUR	31	0.66	93	
United Arab Emirates	40.06	47	HI	41	NAWA	4	0.41	133	
Russian Federation	39.32	48	HI	42	EUR	32	0.74	60	
Mauritius	39.23	49	UM	6	SSF	1	0.65	96	
Qatar	39.01	50	HI	43	NAWA	5	0.61	110	
Costa Rica	38.59	51	UM	7	LCN	3	0.79	32	
Viet Nam	38.35	52	LM	2	SEAO	9	0.92	9	
Belarus	38.23	53	UM	8	EUR	33	0.70	73	
Romania	38.20	54	UM	9	EUR	34	0.74	58	
Thailand	38.10	55	UM	10	SEAO	10	0.76	43	
TFYR of Macedonia	38.03	56	UM	11	EUR	35	0.73	64	
Mexico	38.03	57	UM	12	LCN	4	0.73	61	
Turkey	37.81	58	UM	13	NAWA	6	0.81	23	
Bahrain	37.67	59	HI	44	NAWA	7	0.63	105	
South Africa	37.45	60	UM	14	SSF	2	0.66	94	
Armenia	37.31	61	LM	3	NAWA	8	0.79	34	
Panama	36.80	62	UM	15	LCN	5	0.78	36	
Serbia	36.47	63	UM	16	EUR	36	0.75	55	
Ukraine	36.45	64	LM	4	EUR	37	0.87	15	
Seychelles	36.44	65	UM	17	SSF	3	0.67	88	
Mongolia	36.41	66	LM	5	SEAO	11	0.61	111	
Colombia	36.41	67	UM	18	LCN	6	0.60	114	
Uruguay	35.76	68	HI	45	LCN	7	0.66	91	
Oman	35.00	69	HI	46	NAWA	9	0.67	86	
Brazil	34.95	70	UM	19	LCN	8	0.65	99	
Peru	34.87	71	UM	20	LCN	9	0.60	113	

Global Innovation Index rankings *(continued)*

Country/Economy	Score (0–100)	Rank	Income	Rank	Region	Rank	Efficiency Ratio	Rank	Median: 0.71
Argentina	34.30	72	UM	21	LCN	10	0.75	52	
Georgia	33.83	73	LM	6	NAWA	10	0.62	107	
Lebanon	33.82	74	UM	22	NAWA	11	0.67	87	
Jordan	33.78	75	UM	23	NAWA	12	0.72	68	
Tunisia	33.48	76	UM	24	NAWA	13	0.71	71	
Kuwait	33.20	77	HI	47	NAWA	14	0.73	65	
Morocco	33.19	78	LM	7	NAWA	15	0.64	102	
Bosnia and Herzegovina	32.31	79	UM	25	EUR	38	0.39	135	
Trinidad and Tobago	32.18	80	HI	48	LCN	11	0.66	92	
India	31.74	81	LM	8	CSA	**1**	0.79	31	
Kazakhstan	31.25	82	UM	26	CSA	2	0.53	124	
Philippines	31.05	83	LM	9	SEAO	12	0.76	44	
Senegal	30.95	84	LM	10	SSF	4	0.81	24	
Sri Lanka	30.79	85	LM	11	CSA	3	0.76	46	
Guyana	30.75	86	LM	12	LCN	12	0.65	95	
Albania	30.74	87	UM	27	EUR	39	0.49	129	
Paraguay	30.69	88	LM	13	LCN	13	0.75	54	
Dominican Republic	30.60	89	UM	28	LCN	14	0.61	108	
Botswana	30.49	90	UM	29	SSF	5	0.54	120	
Cambodia	30.35	91	LI	**1**	SEAO	13	0.69	80	
Kenya	30.19	92	LI	2	SSF	6	0.79	30	
Azerbaijan	30.10	93	UM	30	NAWA	16	0.60	115	
Rwanda	30.09	94	LI	3	SSF	7	0.42	131	
Mozambique	30.07	95	LI	4	SSF	8	0.63	104	
Jamaica	29.95	96	UM	31	LCN	15	0.54	121	
Indonesia	29.79	97	LM	14	SEAO	14	0.77	42	
Malawi	29.71	98	LI	5	SSF	9	0.75	53	
El Salvador	29.31	99	LM	15	LCN	16	0.62	106	
Egypt	28.91	100	LM	16	NAWA	17	0.68	83	
Guatemala	28.84	101	LM	17	LCN	17	0.67	89	
Burkina Faso	28.68	102	LI	6	SSF	10	0.68	85	
Cabo Verde	28.59	103	LM	18	SSF	11	0.54	119	
Bolivia, Plurinational State of	28.58	104	LM	19	LCN	18	0.76	45	
Mali	28.37	105	LI	7	SSF	12	0.87	14	
Iran, Islamic Republic of	28.37	106	UM	32	CSA	4	0.63	103	
Namibia	28.15	107	UM	33	SSF	13	0.51	126	
Ghana	28.04	108	LM	20	SSF	14	0.69	79	
Kyrgyzstan	27.96	109	LM	21	CSA	5	0.53	122	
Cameroon	27.80	110	LM	22	SSF	15	0.84	19	
Uganda	27.65	111	LI	8	SSF	16	0.57	118	
Gambia	27.49	112	LI	9	SSF	17	0.77	39	
Honduras	27.48	113	LM	23	LCN	19	0.57	117	
Tajikistan	27.46	114	LI	10	CSA	6	0.65	101	
Fiji	27.31	115	UM	34	SEAO	15	0.28	140	
Côte d'Ivoire	27.16	116	LM	24	SSF	18	0.90	10	
Tanzania, United Republic of	27.00	117	LI	11	SSF	19	0.77	38	
Lesotho	26.97	118	LM	25	SSF	20	0.50	128	
Ecuador	26.87	119	UM	35	LCN	20	0.51	127	
Angola	26.20	120	UM	36	SSF	21	1.02	1	
Bhutan	26.06	121	LM	26	CSA	7	0.33	138	
Uzbekistan	25.89	122	LM	27	CSA	8	0.53	123	
Swaziland	25.37	123	LM	28	SSF	22	0.42	132	
Zambia	24.64	124	LM	29	SSF	23	0.68	81	
Madagascar	24.42	125	LI	12	SSF	24	0.59	116	
Algeria	24.38	126	UM	37	NAWA	18	0.52	125	
Ethiopia	24.17	127	LI	13	SSF	25	0.72	66	
Nigeria	23.72	128	LM	30	SSF	26	0.80	28	
Bangladesh	23.71	129	LI	14	CSA	9	0.61	112	
Nicaragua	23.47	130	LM	31	LCN	21	0.47	130	
Pakistan	23.07	131	LM	32	CSA	10	0.76	47	
Venezuela, Bolivarian Republic of	22.77	132	UM	38	LCN	22	0.68	84	
Zimbabwe	22.52	133	LI	15	SSF	27	0.69	77	
Niger	21.22	134	LI	16	SSF	28	0.29	139	
Nepal	21.08	135	LI	17	CSA	11	0.40	134	
Burundi	21.04	136	LI	18	SSF	29	0.36	137	
Yemen	20.80	137	LM	33	NAWA	19	0.65	97	
Myanmar	20.27	138	LI	19	SEAO	16	0.69	75	
Guinea	18.49	139	LI	20	SSF	30	0.61	109	
Togo	18.43	140	LI	21	SSF	31	0.24	141	
Sudan	14.95	141	LM	34	SSF	32	0.37	136	

Note: World Bank Income Group Classification (July 2013): LI = low income; LM = lower-middle income; UM = upper-middle income; and HI = high income. Regions are based on the United Nations Classification: EUR = Europe; NAC = Northern America; LCN = Latin America and the Caribbean; CSA = Central and Southern Asia; SEAO = South East Asia and Oceania; NAWA = Northern Africa and Western Asia; SSF = Sub-Saharan Africa.

Chapters

The Global Innovation Index 2015: Effective Innovation Policies for Development

Soumitra Dutta, Rafael Escalona Reynoso, and **Alexandra L. Bernard,** Cornell University

Bruno Lanvin, INSEAD

Sacha Wunsch-Vincent, WIPO

Since the Global Innovation Index (GII) 2015 was released last year, the world economy has continued on its path of restrained recovery. The challenge of how to inject more momentum into the economic outlook, spurring economic growth around the globe, remains.

Overcoming a fragile recovery: Laying the foundations for future growth

The world's leading economic institutions predict moderate economic growth in 2015 at levels similar to 2014, preceding a more pronounced increase in growth in 2016.[1]

On average, growth in emerging markets is still clearly positive, despite a significant slowdown that involves Latin America and Sub-Sahara Africa in particular, but also fast-growing middle-income economies such as China.[2] Although risks remain, growth in nearly all high-income countries such as the United States of America (USA) and also in Japan and most countries of the European Union has, if only slightly in most cases, picked up as compared to last year.

Although welcome, the projected increases in growth continue to be modest and uneven. A shared growth momentum with the potential to reduce the persistent high unemployment and secure continued catch-up growth in less-developed nations is lacking.

Indeed, economic output is currently far below the growth trajectory that had been anticipated before the 2009 economic crisis. Worse, recent reports confirm that potential output growth has declined in recent years.[3] This concerns not only high-income but also developing economies, which could see a slowdown in their adoption of productivity-enhancing technologies as their investment and economic growth slows.[4] Whether this is primarily a cyclical issue—and thus a legacy of the economic setback in 2009—or a more structural problem endangering future growth is being vigorously debated by economists.

Regardless of the outcome of this debate, there are clear signs that actions to spur efficiency gains as measured by total factor productivity growth are urgently needed to avert a more persistent low-growth scenario. Increased investments, in areas including infrastructure and technology, and a focus on innovation will be critical in this context.

Innovation expenditures: Back to a new 'normal' of moderate growth

Over the last few years, this report and others have cautioned that the economic crisis might slow innovation more permanently, negatively impacting the future source of growth.[5]

In the aftermath of the economic crisis that began in 2009, the governments in many countries averted this threat.[6] The significant drop of private R&D in these countries was efficiently offset by government R&D investments in 2010 and 2011.[7] Continued high spending in select emerging countries such as China, Turkey, and Mexico, and also in high-income Republic of Korea, subsequently led to significant overall R&D growth through in 2012 (see Box 1).

By our estimates, global R&D expenditures have thus re-entered a moderate growth path. Importantly, on average, businesses are again the drivers of R&D spending growth.

Still, the stabilization or fall of government R&D budgets in advanced countries, the slowdown in emerging markets, and the decreased appetite of business investment have slowed the advance of innovation expenditures. In 2013, according to our estimates, global R&D growth was subdued—the result in part of weakening private R&D expenditure growth as of late 2012, which has seemingly intensified in 2014. Global R&D intensity—computed as global R&D expenditures over global GDP—stayed relatively flat: from 1.6% in 2008 to 1.7% in 2013, with Israel, the Republic of Korea, and Japan being the most R&D-intensive countries.[8]

In terms of the global use of intellectual property (IP), the latest figures point to 9% patent filing growth in 2013; this is slightly

Box 1: Moderate post-crisis R&D expenditure growth largely driven by the private sector

After global R&D spending stagnated (or, in many advanced economies, fell) in 2009, combined global private and public R&D expenditure followed a path of constant growth, increasing by 3.7% in 2010, 5.3% in 2011, and 5.6% in 2012. Although data are still incomplete, estimated global R&D spending grew by about 4.3% in 2013.[1] Gross domestic expenditures on R&D (GERD) in the high-income economies of the Organisation for Economic Co-operation and Development (OECD) increased by 1.4% in 2010, 3.6% in 2011, 3% in 2012, and 2.6 % in 2013.[2] The slowdown after 2011 was triggered mainly by continued weakening public R&D spending in those economies.

The worldwide recovery of business enterprise expenditure on R&D (BERD) was quick, reaching 3.2% growth in 2010 and gaining at the faster pace of 7.2% in 2011 and 6.6% in 2012. Although data are incomplete for 2013, BERD is estimated to exhibit a more moderate growth of 5.1% in that year.[3] Businesses in high-income countries of the OECD contributed to the recovery of R&D expenditure with 4.8% growth in 2011, 4% growth in 2012, and 3.2 % growth in 2013.[4]

R&D spending by the top R&D performing 2,500 companies worldwide, as identified by the European Union's 2014 Industrial R&D Investment Scoreboard, grew by 8% in 2011, 7 % in 2012, and a slower 4.9% in 2013.[5] According to PricewaterhouseCoopers and Strategy&, R&D spending by the top R&D performing 1,000 companies worldwide grew by 9.7% in 2012 and 3.8% in 2013, but only 1.4% in 2014.[6]

Regardless of the global economic slowdown, business and total R&D spending are significantly above crisis levels in most economies; so is the spending of top R&D firms, which reached new heights in 2013 or 2014. The situation in terms of total R&D spending across countries is not uniform, however (see Tables 1.1 and 1.2). A large number of Eastern European countries, other large European economies such as France and Ireland, some high-income Asian economies such as the Republic of Korea, and emerging economies such as China and the Russian Federation have experienced no aggregate drop in R&D spending. Some economies, such as Slovakia and Estonia, have recovered from the slowdown quickly, offsetting the plunge in R&D spending seen during the crisis. Others, such as Israel and Germany, have seen a more timid recovery. Japan has recently returned to its pre-crisis levels for combined public and private R&D, and the United Kingdom's business R&D spending has now fully recovered.

Nonetheless, some high-income economies—such as Portugal, Finland, Singapore, and South Africa—continue to exhibit R&D spending below their pre-crisis levels.

Note

Thanks to Antanina Garanasvili, PhD candidate, University of Padova, and our colleagues from the UNESCO Institute for Statistics for help in producing Box 1.

Notes and references for this box appear at the end of the chapter.

(Continued)

weaker than the two-decade growth record set in 2012.[9] These aggregates hide the fact that actual IP filings have decreased in Japan and many European countries, while they have strongly increased in China and the Republic of Korea.

Considering these various factors—namely, sluggish investment, continued weak growth, and persistent unemployment—boosting innovation expenditures from businesses and ensuring the dynamic impact needed to re-fuel global growth is the challenge. This objective will require not only longer-term strategies on the corporate side but also ambitious policies from governments.

Importantly, the challenge of sustaining growth and innovation is no longer the prerogative of high-income countries alone. This is why this year's GII explores the theme of 'Effective Innovation Policies for Development'.

Effective innovation policies for development

On average, the technology gap between developing and developed countries appears to be narrowing.[10] One explanation is that more and more developing countries outperform in innovation inputs and outputs relative to their level of development (see Chapter 2). The GII 2015 studies these 'outperformers'—including Armenia, China, Georgia, India, Jordan, Kenya, Malaysia, the Republic of Moldova, Mongolia, Uganda, and Viet Nam.

These and other countries have realized that technology adoption alone is no longer sufficient to maintain a high-growth scenario; rather innovation is now crucial for catching up to high-income countries. As a result, national innovation policy programmes are flourishing in low- and middle-income countries.

The specificities of innovation systems in developing countries

One question looms large: How can the prevailing innovation policy approaches of high-income countries be adapted to work for developing countries, if at all?

To find an answer, the first step is to look at the innovation policy mixes that high-income economies have fine-tuned over the last decades.[11] Policy makers in these countries follow an *innovation system* approach in which innovation—understood broadly—is the result of complex

Box 1: Moderate post-crisis R&D expenditure growth largely driven by the private sector *(cont'd.)*

Table 1.1: Gross domestic expenditure on R&D (GERD): Crisis and recovery compared

Countries with no fall in GERD during the crisis that have expanded since

	CRISIS		RECOVERY			
	2008	2009	2010	2011	2012	2013
China	100	124	145	166	193	218
Poland	100	113	128	139	167	166
Turkey	100	111	121	134	147	157
Korea, Rep.	100	106	119	133	147	156
Slovenia	100	103	118	140	145	144p
Hungary	100	108	110	116	122	137
Belgium	100	100	107	114	119	121p
Russian Fed.	100	111	104	105	112	113
France	100	104	105	108	110	110p
Denmark	100	105	102	104	105	106p
Argentina	100	115	128	146	166	n/a
Switzerland	100	n/a	n/a	n/a	113	n/a
Mexico	100	102	113	110	n/a	n/a
Ireland	100	109	108	106	108	n/a
Australia	100	n/a	102	102	n/a	n/a
Italy*	100	99	101	100	102	99p

Note: * Countries that reached 99% of their 2008 GERD spending in 2013; 2008 is indexed as 100%.

Countries with fall in GERD but above pre-crisis levels in 2013

	CRISIS		RECOVERY			
	2008	2009	2010	2011	2012	2013
Slovakia	100	97	132	147	181	188
Czech Rep.	100	99	105	125	142	150p
Estonia	100	94	110	176	170	139p
Netherlands	100	99	102	114	116	116p
Germany	100	99	103	109	113	115p
Israel	100	96	97	105	112	115
Austria	100	97	104	105	111	111p
Norway	100	101	99	102	105	108p
Japan	100	91	93	96	97	102
Chile	100	93	92	104	113	n/a
United States	100	99	99	101	105p	n/a

GERD below crisis levels in 2013

	CRISIS		RECOVERY			
	2008	2009	2010	2011	2012	2013
United Kingdom	100	99	98	99	96	98p
Sweden	100	93	92	95	97	98m
Canada	100	100	99	99	97	94p
Finland	100	97	99	99	92	88
Greece	100	90	82	83	80	88p
Spain	100	99	99	96	90	88p
Portugal	100	106	105	98	89	87p
Luxembourg	100	99	91	87	71	73p
Romania	100	75	73	81	79	66
Singapore	100	82	88	100	96	n/a
Iceland	100	100	n/a	93	n/a	n/a
South Africa	100	92	83	85	88	n/a

Note: p = provisional data; m = underestimated or based on underestimated data.

Source: OECD MSTI, February 2015; data used: Gross domestic expenditure on R&D (GERD) at constant 2005 PPP$, index = 2008.

Table 1.2: Business enterprise expenditure on R&D (BERD): Crisis and recovery compared

Countries with no fall in BERD during the crisis that have expanded since

	CRISIS		RECOVERY			
	2008	2009	2010	2011	2012	2013
Poland	100	104	110	135	201	234
China	100	124	145	171	200	228
Hungary	100	118	125	138	152	180
Slovenia	100	103	124	160	170	171p
Turkey	100	101	116	131	150	168
Korea, Rep.	100	105	118	135	152	162
France	100	102	105	110	113	114p
Russian Fed.	100	110	100	102	104	109
Ireland	100	115	115	116	120	n/a
Mexico	100	109	113	111	n/a	n/a
Switzerland	100	n/a	n/a	n/a	106	n/a
Denmark*	100	105	98	99	99	99p

Note: * Countries that reached 99% of their 2008 BERD spending in 2013; 2008 is indexed as 100%.

Countries with fall in BERD during the crisis but above crisis levels in 2013

	CRISIS		RECOVERY			
	2008	2009	2010	2011	2012	2013
Slovakia	100	93	130	127	174	203
Estonia	100	98	127	257	226	153p
Czech Rep.	100	96	103	118	130	138p
Netherlands	100	93	98	127	134	134p
Belgium	100	97	105	114	120	123p
Israel	100	97	97	105	111	114
Germany	100	97	99	107	111	113p
Austria	100	96	103	104	110	110p
Norway	100	98	95	100	103	106p
United Kingdom	100	96	96	102	99	102p
Italy	100	99	102	103	103	100p
Argentina	100	93	108	131	130	n/a
United States	100	96	94	97	103p	n/a
Japan*	100	88	90	94	94	99

Note: * Countries that reached 99% of their 2008 BERD spending in 2013; 2008 is indexed as 100%.

BERD below crisis levels in 2013

	CRISIS		RECOVERY			
	2008	2009	2010	2011	2012	2013
Sweden	100	88	86	88	88	92
Canada	100	98	95	96	92	87
Spain	100	93	93	91	87	85p
Portugal	100	100	96	93	88	82p
Finland	100	93	93	94	86	82
Romania	100	101	94	97	103	67
Luxembourg	100	96	79	78	56	57p
Australia	100	96	97	97	n/a	n/a
Chile	100	68	68	88	96	n/a
Iceland	100	92	88	90	n/a	n/a
Singapore	100	70	75	87	81	n/a
South Africa	100	83	70	69	66	n/a

Note: p = provisional data.

Source: OECD MSTI, February 2015; data used: Business enterprise expenditure on R&D (BERD) at constant 2005 PPP$, index = 2008.

interactions among all innovation actors, policies, and institutions.[12] They also draw on the understanding, born of experience, that converting a scientific breakthrough or an idea into a successfully commercialized innovation often involves a long journey with no guaranteed outcomes. Beyond incentivizing research, complementary measures are required to bring product, process, marketing, and organizational innovation to fruition.

Two main policy strands form the core of present innovation policy. On the one hand, there is a need to improve the framework conditions for innovation; these include the business environment, access to finance, competition, and trade openness, as captured in the Innovation Input Sub-Index of the GII model.

On the other hand, nations also need dedicated innovation policies targeting both innovation actors and the linkages among them; these include collaborative research projects, public-private partnerships, and clusters.[13] High-income countries follow a set of dedicated supply- and demand-side innovation policies (see Chapter 3 by Goedhuys et al.).[14] This entails creating a strong human capital and research base that includes research infrastructures, sophisticated firms and markets, innovation linkages, and knowledge absorption, and that fosters innovation outputs as captured by the GII. Direct support for business R&D and innovation is provided in the form of grants, subsidies, or indirect measures such as R&D tax credits. Universities and public research organizations are funded either via across-the-board or more competitive funding mechanisms.

In addition, there is also renewed interest in demand-side measures. This interest is evident while using classic instruments such as public procurement, as well as while testing out new approaches to promote innovation specific to overcoming a key societal challenge in fields such as clean energy and health. Demand-side measures also facilitate the uptake of specific innovations (including via standards or regulations) and can foster user-led innovation.[15] Business executives in charge of innovation surveyed in Chapter 5 by Engel et al. stress the importance of forward-thinking legislation to support future innovation and the related markets (e.g., for autonomous cars). They also stress the need for the international harmonization of regulations for new technologies so they can diffuse more rapidly and be commercially viable.

Another new policy development is the focus on creating an 'innovation culture' with businesses, students, and society at large. This is meant to spur greater entrepreneurial activity and to achieve a better public appreciation of the role of science and innovation. The design of proper metrics and evaluation strategies of policies is emphasized too. Indeed, the formulation and measurement of innovation policies is increasingly treated as a science in its own right.

Regardless of these developments, finding the right combination between demand and supply measures, and between public and private funding for innovation, remains largely a trial-and-error type of endeavour. In addition, although it is tempting to think so, a simple migration of policy mixes developed in high-income countries to developing countries is unlikely to bear fruit. Innovation policies and institutions need to be context-specific, reflecting the extensive heterogeneity and varying trajectories of countries.[16]

The heterogeneity among countries aside, broadly speaking a number of differences between developed and developing countries need to be considered:[17]

First, evidently the framework conditions for innovation are more challenging in developing countries. Beyond macroeconomic challenges, this often manifests itself in poorer infrastructure; weaker product, capital, and labour markets; and weaker education systems. Ineffective regulatory set-ups that do not provide the proper incentives to innovation are often a problem.[18] Developing countries also frequently face inherently dissimilar pressures—for example, high population growth and a resulting younger population, or more intense inequalities.

Second, for sheer budgetary reasons, the capacity to finance, coordinate, and evaluate a large package of innovation policies is constrained in developing countries. Although arguably all components of innovation policy dimensions seem important, tough priority-setting is required. Moreover, in the context of developing countries, the innovation policy coordination between various local, regional, and national levels of government is often even more demanding than it is in developed ones.

Third, the industrial structure of most low- and middle-income countries is usually different, with a greater reliance on agriculture, the extraction of raw materials, and too few—mostly low-value-added—manufacturing activities (e.g., food processing, textiles), as well as an increasing reliance on services industries such as creative sectors, tourism, transport, and retail activities. Micro- and small businesses play an above-average role for the

broader economy and potentially for innovation too. Although frequently neglected, the informal sector often matters greatly, as described in Chapters 9 by Ndemo on Kenya and 11 by Ecuru and Kawooya on Uganda.

Fourth, country- or sector-specific exceptions aside, innovation capabilities in developing countries are typically less advanced than those in developed countries. For one, the human resource base remains comparatively weak (see Chapter 2); the brain drain abroad is high (see Chapter 7 by Chaminade and Moskovo on Georgia and the GII report of 2014). Innovation actors and linkages between them are usually weaker; public research organizations are often the only actors engaged in research and often operate in an isolated fashion without links to the real economy, while firms tend to have a low absorptive capacity. In the formal sector, improvements in maintenance, engineering, and quality control, rather than fresh R&D investment, tend to drive innovation. Sources of learning and innovation frequently result from foreign direct investment (FDI) or technology acquisition from technologies developed abroad. Firms tend to have a low absorptive capacity and do not interact with scientific institutions or science more broadly. As noted in Chapter 5, collaborating with external partners in innovation remains an important challenge for companies.

In turn, innovation under scarcity is the daily dare of dynamic clusters of small, informal firms and other actors in developing countries. As outlined by Mashelkar (a member of the GII Advisory Board) in 2012, the focus is often on innovating with limited means and with the aim of providing more affordable access of quality goods and services and improving the livelihood for poorer segments of the population.[19]

Tailoring innovation policies to the needs of developing countries

A few lessons that apply to the future of innovation policy approaches in developing countries emerge from this edition of the GII and existing innovation policy experiences.

Institutionally speaking, a persistent, well-coordinated national innovation policy plan with clear targets and a matching institutional set-up have proved a key ingredient for success. All too often a succession of vaguely defined, often uncoordinated, and inadequately implemented innovation policy plans can be observed. In many areas, however, perseverance is key to success. China, for example, has succeeded in making science and technology a cornerstone of higher education and R&D driving innovation (see Chapter 6 by Chen et al.); India is another example of success in education and ICT development driving innovation (see Chapter 8 by Gopalakrishnan and Dasgupta). Institution-building—the development of human resources and innovation capacities in certain fields of science or particular sectors—is indeed an expensive medium- to long-term process that can hardly be fast-tracked.

In terms of organizational set-up, a coordinating ministry or body often offers the managing and leadership hub required, as shown in Chapter 10 by Rasiah and Yap on Malaysia. The fragmentation of key innovation responsibilities across different ministries or agencies is often a drag on effectiveness. The mere creation of an 'innovation ministry', however, will rarely prove successful if it remains surrounded by a plethora of other often more powerful ministries. Instead, cross-cutting innovation agencies or councils reporting directly to, or chaired by, top-level government officials such as the prime minister have been successful (see Chapters 7 and 9 on Georgia and Kenya).

Importantly, developing countries should not forget the significance of coordinating with other, related policy strategies—in particular those aimed at enhancing education and skills, as well as key economic policy matters such as foreign investment and international trade (see Chapter 4 by Atkinson and Ezell and Chapter 10 on Malaysia).

A more strategic coordination of IP policies with innovation policy objectives is desirable, while also fostering the creation of recognized brands, strong physical or intangible assets, and appealing creative works.

At the outset, the design of innovation policies will require a thorough review of the existing innovation system, along with its strengths and weaknesses. The involvement of key innovation actors in this process, including successful national innovators and entrepreneurs abroad—is critical.

Effective implementation will entail building the skills needed to execute policy. Ensuring access to suitably skilled science, technology, and innovation (STI) policy managers remains a work in progress even in high-income countries.

In addition, innovation metrics are needed to assess the state of play. Developing countries are increasingly adopting rich-country STI indicators and surveys (refer to Box 1 in Annex 1 of the first chapter of the GII 2013). Yet metrics focused on R&D personnel or expenditures, or innovation surveys sent to formal firms, for instance, might provide only a partial—or even distorted—measure of innovation realities in

developing economies. In many of them innovation works differently than it does in advanced economies, and is more incremental and based in grassroots experience, often taking place outside the formal business sector. Including but not limited to the GII, work is still needed to produce innovation metrics and survey approaches that are more appropriate for developing countries.

In terms of innovation policy substance, a few lessons emerge from this edition of the GII and the experience of developing countries. Despite of the specific nature of innovation in developing countries, policies are often framed narrowly and focus on high-tech products, clusters, or special economic zones, and are formulated with an eye on the integration of local operations and products into global value chains through the support of FDI and the use of lower tariffs. For this reason, these strategies are also often focused on absorbing technology from foreign multinational enterprises and creating national champions or particular sectoral high-tech or global value chain–related strengths.

This 'international specialization'-type approach is not without success: indeed, it was often vital in driving the ascension of many technology-savvy developing countries. China, for instance, focused on telecommunications and electronics assembly, India on software back-office operations and software, Viet Nam on IT and automotive assembly, and Malaysia on IT assembly. All are innovation outperformers as identified in Chapter 2 of this report.

However, this type of strategy has often led to enclaves of higher-productivity activities, with weak links to the rest of the economy, composed by a plethora of micro and small firms that operate far from the technological frontier. Hence, even if a country has been successful in attracting FDI and in becoming an integral part of the global value chain, there is no guarantee that spillovers will automatically spur more domestic innovation (see Chapters 7 and 10 on Georgia and Malaysia).

Overall, risks associated with policies aimed at fostering national champions or pockets of excellence remain high. The number of announced high-tech clusters that remain empty shells and of strategic 'national priority' sectors that never took off is a vivid reminder of such risks. Top-down approaches in designating clusters or picking champions and priority sectors might come at the expense of fostering true bottom-up entrepreneurship that thrives on the creation of an open and competitive level playing field that gives space to potential local innovators. Every so often these activities come at the expense of focusing on more domestically generated innovation. Domestic innovation is significant because it can address actual local challenges through technologies that are not at the world frontier but that work in the local context.

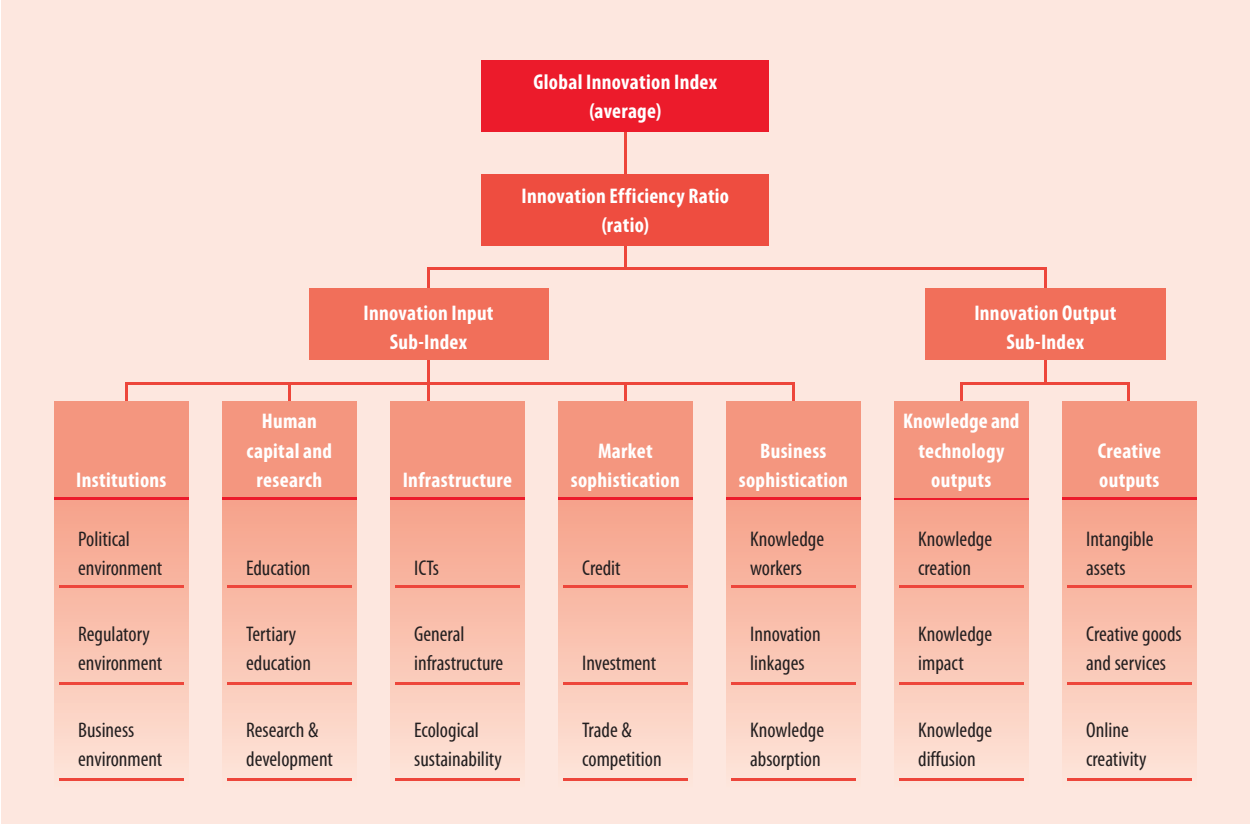
Fostering existing domestic innovation capabilities—including in traditional sectors such as agriculture, food, mining, energy—should be emphasized. This will require, first, a more strategic focus on and assessment of key strengths, and then a determination of how these strengths can be built up. In the process, and to leverage their strengths, countries will also want to devise smart and more customized IP strategies (see the example of Georgia in Chapter 7 for agricultural sciences and of Uganda in Chapter 11 for the agro-processing industry).

Furthermore, the disruptive and remarkable nature of innovation that is more service-based and works from the bottom up tends to be underestimated. Indeed, certain African countries have experienced rapid and spontaneous innovations in finance (e-banking), telecommunications, medical technologies, and other areas in recent years. The well-known case of M-PESA in Kenya noted in Chapters 3 and 9 is just one example. The developing-country context and a regulatory environment that is sometimes more permissive can help innovation in the service sector and promote leapfrogging in ways rarely seen in higher-income economies. Moreover, developing countries have seen the emergence of more grassroots-type innovations for health, education, and transport that make significant contributions to the quality of daily lives.

In sum, the potential payoff of creating technology-neutral framework conditions for more bottom-up innovation, along with a certain degree of serendipity, remains significant. Introducing more labour market flexibility; allowing for fair competition among private, foreign, and state-owned firms; facilitating access to finance; making it easier to start a business; and fostering an efficient ICT infrastructure (see Chapter 4) are actions that—at times—might be both faster to implement and can yield quicker returns. Yet this approach comes with less control; progress and impacts are not easily monitored by data.

Priorities for dedicated innovation policies should focus on three opportunities. First, all the GII-related national assessments on the ground show that increasing business sophistication—in terms of its linkages to science and its institutions (for example, via joint research projects), foreign subsidiaries, and the recruitment of scientists—is often the single biggest challenge.

Figure 1: Framework of the Global Innovation Index 2015



Unfortunately, some developing countries produce above-par science and engineering graduates and researchers but never put these talents to use in local business innovation, leaving these precious resources idle.

Second, although significant resources are devoted to attracting foreign multinationals and investment, less attention is paid to the question of how to capture and maximize positive spillovers to the local economy. Intermediate organizations such as non-governmental organizations or measuring and testing centres can play a crucial role in transmitting the knowledge of multinationals to local actors, as documented in Chapter 7 on Georgia. Furthermore, labour mobility and the upgrading of supplier activities are essential. People working for multinationals can also incentivized to start their own businesses. Moreover, scaling up innovative activities in small and micro-enterprises in the informal sector as well as in formal firms and strengthening their linkages to formal institutions should be a priority.[20]

Finally, steering innovation and research to finding context-specific solutions to local challenges that are not necessarily frontier technologies or part of existing global value chains seems underexplored.[21] Such solutions can be applicable to particular energy, transport, or sanitation needs; or can be for processing local produce, upgrading local artisanship, or reaping economic rewards from a thriving creative industry.

Rallying national efforts around particular health or other developing-country challenges that remain unaddressed by innovation systems in higher-income countries is also promising. Other developing countries facing similar conditions and seeking similar solutions constitute a large potential set of buyers for context-specific innovation; south-south trade in tailored innovative goods and services is increasingly both a reality and a goal.

The GII conceptual framework

The GII is focused both on improving ways to measure innovation and understanding it, and on identifying targeted policies and good practices. The GII helps to create an environment in which innovation factors are continually evaluated. It provides a key tool of detailed metrics for 141 economies this year, representing 95.1% of the world's population and 98.6% of the world's GDP (in current US dollars).

Four measures are calculated: the overall GII, the Input and Output

Sub-Indices, and the Innovation Efficiency Ratio (Figure 1).

- **The overall GII score** is the simple average of the Input and Output Sub-Index scores.
- **The Innovation Input Sub-Index** is comprised of five input pillars that capture elements of the national economy that enable innovative activities: (1) Institutions, (2) Human capital and research, (3) Infrastructure, (4) Market sophistication, and (5) Business sophistication.
- **The Innovation Output Sub-Index** provides information about outputs that are the results of innovative activities within the economy. There are two output pillars: (6) Knowledge and technology outputs and (7) Creative outputs.
- **The Innovation Efficiency Ratio** is the ratio of the Output Sub-Index score over the Input Sub-Index score. It shows how much innovation output a given country is getting for its inputs.

Each pillar is divided into three sub-pillars and each sub-pillar is composed of individual indicators, for a total of 79 indicators. Further details on the GII framework and the indicators used are provided in Annex 1. It is important to note that each year the variables included in the GII computation are reviewed and updated to provide the best and most current assessment of global innovation. Other methodological issues—such as missing data, revised scaling factors, and new countries added to the sample—also impact year-on-year comparability of the rankings (details of these changes to the framework and factors impacting year-on-year comparability are provided in Annex 2).

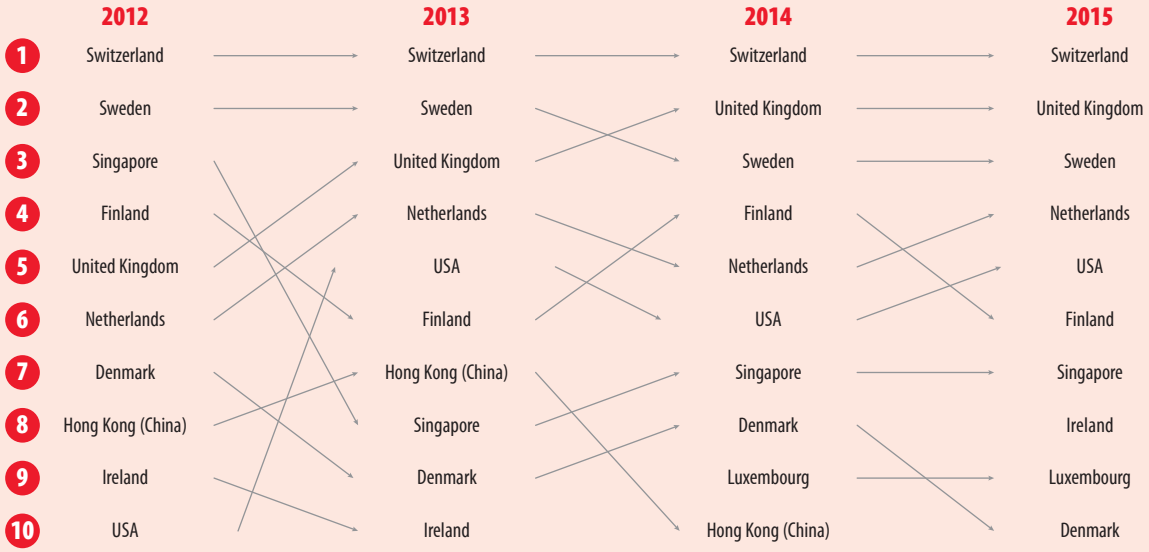
The Global Innovation Index 2015: Main findings

The GII 2015 results have shown consistency in areas such as top rankings and the innovation divide. However, there have also been some new developments, particularly evident within the middle-income economies and the Sub-Sahara Africa region. In the following pages, a number of findings from the report are exposed in greater detail. The key messages are:

- **Among the top, quality matters.** Among high-income countries, a major divider can be found in the quality of innovation. This is the area in which the USA and the United Kingdom (UK), largely as a result of their world-class universities, stay ahead of the pack (refer to Box 3 on pages 14–15 for further details).
- **Several emerging innovators are now on the heels of rich countries.** Differences are eroding between the champions of the middle-income countries (Malaysia, China) and the lower tier of high-income countries (refer to Box 2 on page 12–13 for further details).
- **Institutions matter.** Across regions, the most visible differentiator in terms of innovation performance is found in the Institutions pillar. GII metrics hence confirm a core principle of international policy literature: good innovation policies start with good innovation institutions.

  The set of rules defined by institutions is particularly important for developing economies because the rules stipulate norms of interaction among actors in recurrent situations. Eventually, these rules set the formal and informal guidelines followed by national, international, private, and public realms as they interact to produce and develop new ideas and innovations in particular regions.
- **Among poor economies, business sophistication makes a big difference.** Low-income countries that have made efforts on business sophistication are able to do well, sometimes overtaking some middle-income countries (refer to Box 2 for further details).
- **Encouraging signs emerge in Sub-Saharan Africa.** In 2015 the Sub-Saharan Africa region has caught up with and even superseded Central and Southern Asia in several pillars (Institutions, Business sophistication, and Creative outputs). In addition to South Africa, some preeminent performances from this region include some of the same economies flagged in 2014 as stand-out innovation achievers: Burkina Faso, Kenya, Malawi, Rwanda, Senegal (refer to Figure 4 for further details and Chapter 1, Box 4, in the GII 2014 report).
- **BRICS economies—particularly China—are gaining ground in innovation quality.** Among the middle-income top 10 in innovation quality, the BRICS economies are at the top. At the same time, the distance between China and the others is rapidly increasing (see Box 3). The Russian Federation is now among the high-income group; it would be 3rd if it was still considered among the upper-middle income countries.

Figure 2: Movement in the top 10 of the GII



Stability at the top, with a strong performance from the UK and the USA

As seen in recent editions of the GII, there is relative stability in the top 10: Switzerland leads again in 2015, the UK takes the second spot, and the USA makes it into the top 5. Switzerland ranks consistently as number 1 in the GII and among the top 25 in all pillars and all but four sub-pillars. Finland (6th) declines by two spots this year. Except for one change, the top 10 ranked economies in the GII 2015 remain the same as in 2014. Ireland (ranked 11th in 2014) enters the top 10 at 8th position, pushing Hong Kong (China) just over to 11th position (down from rank 10 in 2014). The top 10 economies in 2015 are listed below; Figure 2 shows movement in the top 10 ranked economies over the last four years:

1. *Switzerland*
2. *United Kingdom (UK)*
3. *Sweden*
4. *Netherlands*
5. *United States of America (USA)*
6. *Finland*
7. *Singapore*
8. *Ireland*
9. *Luxembourg*
10. *Denmark*

Furthermore, stability across the top 25 has also been evident across the years. With the exception of Malta dropping out (26th this year) and the Czech Republic moving in (24th), the top 25 have included the same set of countries since 2011. Within this group, however, some notable large high-income countries are moving upwards and closer to the top-tier performers. Three clear cases are Germany (15th in 2013, 13th in 2014, 12th in 2015), the Republic of Korea (18th in 2013, 16th in 2014, 14th in 2015), and Japan (22nd in 2013, 21st in 2014, 19th in 2015): The Republic of Korea and Japan can attribute their ascent primarily to improved rankings on the Output Sub-Index, and Germany to the Input Sub-Index.

Several emerging countries now on the heels of richer countries

The GII 2015 confirms the continued existence of global innovation divides (see Box 2). The gap between the innovation performance of high-income top performers and those poorer economies that follow is large. However, in the case of a few countries, this gap is beginning to erode. This is especially noticeable between the lower tier of high-income economies and the upper-middle-income group. China (GII 29th) and Malaysia (GII 32nd) now achieve scores closer to those of high-income countries in four of the GII pillars. More specifically, they are closing the gap in areas associated with credit, investment, and economic competition (Market sophistication); those linked to the acquisition and transfer of knowledge (Business sophistication); those associated with education and with R&D (Human capital and research); and those associated with the creation, impact, and diffusion of

Box 2: The persistent global innovation divide: A few countries about to bridge the gap

Stability among the top economies has always been a recognized feature of the GII rankings. This steadiness has allowed Switzerland to remain number 1 for the fifth consecutive year and for the composition of the top 25 economies to continue mostly unchanged. Yet the countries within the top 10 and top 25 ranks have seen some movement: for the first time the Czech Republic (24th) is part of the top 25 group, and Ireland (8th) is back in the top 10. Conversely, Hong Kong (China) (11th) and Malta (26th) have left their positions among the top 10 and top 25 economies, respectively.

The persistence of an innovation divide is confirmed by the fact that the cluster of the top 25 GII leaders are all high-income economies, and that its composition has remained relatively unchanged since 2011. Although consistency has been unmistakable at the high-income level, noticeable ranking moves are happening more frequently within lower-income groups.

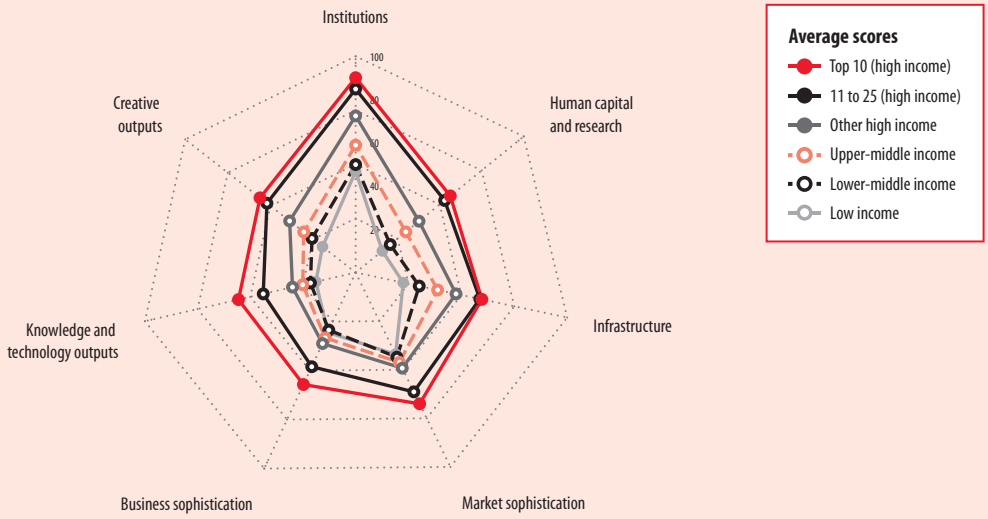
The distance between the top-ranked economies and the groups that follow is still apparent, however, as captured by Figure 2.1. This figure shows the three different echelons of the high-income economies (the top 10, the top 11 to 25, and other high-income economies that rank below 25), as well as the upper- and lower-middle-income and low-income groups.

High-income economies

This year the top 10 high-income economies perform better than the second-tier high-income group in all pillars, particularly in Market sophistication (pillar 4), Business sophistication (pillar 5), and Knowledge and technology outputs (pillar 6). Compared with the results of the GII 2014, the gap between these two groups has expanded, as seen most markedly in pillars 5 and 6, and marginally in Human capital and research (pillar 2). However, a reduction in the divide between the two high-income groups is visible in Infrastructure (pillar 3), and especially in the two pillars—Market sophistication (pillar 4) and Creative outputs (pillar 7)—where both groups have achieved almost the same average scores (59.7 and 58.7, respectively).

The largest divide between income groups is evident between the second and third tiers of high-income economies. The high-income economies that are ranked above 25 perform at significantly lower levels in the Human capital and research (pillar 2), Knowledge and technology outputs (pillar 6), and Creative outputs (pillar 7) than the second-tier high-income group (those ranked 11–25). Yet, as the third-tier high-income group starts to perform better in Institutions (1), Human capital and research

Figure 2.1: The persistent innovation divide: Stability among the GII 2015 top 10 and top 25



Note: Countries/economies are classified according to the World Bank Income Group Classification (July 2013).

(Continued)

Box 2: The persistent global innovation divide: A few countries about to bridge the gap *(cont'd.)*

(2), and Knowledge and technology outputs (6), the gap between the two groups is beginning to lessen.

Middle-income economies

When contrasting high-income with middle-income performance, the divide can be most clearly seen in Institutions (pillar 1), Infrastructure (3), and Creative outputs (7). It is only in Business sophistication (5) that the gap between these two groups is narrowing. On average, the upper-middle-income group has scores similar to those of third-tier high-income economies. For example, China (29th) and Malaysia (32nd) from the upper-middle-income group almost mimic the performance of the third-tier high-income group, increasing the likelihood that they might join the top 25 group in the near future.

Low-income economies

This year the lower-income groups continue to show some success at closing the innovation divide. Although this group as a whole performs at levels below those of lower-middle-income economies in six out of the seven GII pillars, their respective scores are comparable in Market sophistication (a difference of only 1.4 points) and Knowledge and technology outputs (a difference of 2.6 points). Since 2013, the low-income cluster has gotten closer to the lower-middle cluster in Business sophistication (pillar 5). This performance is comparable with that of the upper-middle-income group (a difference of 2.8 points) and suggests that greater efforts to adopt market economy frameworks are taking place within economies at that income level.

Regional differences

Aggregate regional rankings based on the GII average scores show the Northern America region at the top (57.9), followed by Europe (48.0), South East Asia and Oceania (42.7), Northern Africa and Western Asia (35.3), and Latin America and the Caribbean (32.5).[1] This year Sub-Saharan Africa's average score (27.1) is marginally above that of Central and Southern Asia (27.0).

Note

1 Regional groups are based on the United Nations classification, United Nations Statistics Division, Revision of 13 October 2013.

knowledge (Knowledge and technology outputs).

Similarly, a select number of low-income economies are also performing increasingly well at levels hitherto reserved for the lower-middle-income group. Cambodia (GII 91st) is closing the gap in Market sophistication and Business sophistication as well as Institutions; Malawi (GII 98th) is doing so in Institutions, Business sophistication, and Knowledge and technology outputs; Mozambique (GII 95th) in Human capital and research, and Market and Business sophistication and Knowledge technology outputs; and Rwanda (GII 94th) in Institutions and both Market and Business sophistication.

The greatest divide between developed and developing economies is in Institutions, Infrastructure, and areas related to intangible assets, creative goods and services, and online creativity (Creative outputs). Conversely, the divide appears to be reducing in two other pillars: upper-middle-income economies South Africa (GII 60th) and Malaysia (GII 32nd) are now performing at the levels seen in second-tier high-income economies in Market sophistication, and Malaysia and China at those same levels in Business sophistication (see also Chapter 2).

Beyond quantity: The critical importance of high-quality innovation

In terms of innovation *quality*—as measured by university performance, the reach of scholarly articles, and the international dimension of patent applications—the USA holds the top place within the high-income group, followed by the UK, Japan, Germany, and Switzerland (see Box 3). Top-scoring middle-income economies are narrowing the gap on innovation quality with China in the lead, followed by Brazil and India, fuelled by an improvement in the quality of higher-education institutions.

On average, the gap in innovation quality between top-performing high-income and top-performing middle-income economies appears to be shrinking. Although the average number of patents filed has increased for the middle-income group, the gradual improvement in innovation quality for these countries appears to stem from an expansion in the quality of higher-education institutions.[22]

The BRICS economies are at the top of the innovation quality composite ranking among the middle-income group.[23] This group of nations, with the exception of Brazil's score for the number of patents filed, increased their scores in all three quality indicators. China's score for quality of innovation has improved more rapidly than both those of its BRICS neighbours and

Box 3: Innovation quality: USA and China at the top, with a large gap between them

Measuring the quality of innovation-related input and output indicators as well as their quantity is critical. Indeed, some countries have managed to ramp up the quantity of some indicators—such as education expenditures, patents, or publications, for instance—without making much impact. It is to address this concern that three additional indicators were introduced into the Global Innovation Index (GII) in 2013, aiming to better measure the *quality* of innovation: (1) quality of local universities (2.3.3, QS university rankings average score of top 3 universities); (2) internationalization of local inventions (5.2.5, patent families filed in at least three offices); and the number of citations that local research documents receive abroad (6.1.5, citable documents H index). Figure 3.1 shows the sum of the scores of these three indicators and captures the top 10 highest-performing high- and middle-income economies for this composite indicator.

Top 10 high-income economies

Among the high-income economies, the United States of America (USA) tops the GII rankings in innovation quality. This performance results from its 2nd place in top university rankings and its 1st place in the number of research document citations abroad (citable documents abroad) for the third year in a row. The United Kingdom (UK) regains the 2nd position in innovation quality this year, above Japan and Germany, with its 1st place in the top university rankings and citable documents abroad (where it ties with the USA), keeping the spot it has held since 2013. This upward movement can be also attributed to increasing levels of patents filed in at least three offices (patents filed). Similarly, in 2015 the UK also holds 2nd place in the overall GII for second year in a row. Japan (GII rank of 19), while moving up in the overall GII rankings, drops one position this year to 3rd in innovation quality. Although retaining the same rank in top university rankings and citable documents abroad (7th and 6th, respectively), Japan slipped from 1st to 2nd in patents filed this year, affecting its overall performance on the quality of innovation.

Like Japan, Canada (GII 16) and France (GII 21) perform better in the combined quality indicators ranking than in the overall GII ranking. In combined innovation quality, Canada moves up one position to 6th, switching places with France. This can be explained in part by Canada's improvement in both the top university rankings and patents filed, in addition to France's slightly less robust performance in the latter this year. France, however, retains its 4th position in citable documents abroad for the third consecutive year and achieves 7th place in the quality of innovation. The Republic of Korea moves up two positions in both the overall GII (rank 14) and in the composite quality of innovation (8) this year. This is partially the result of a marginally better performance in the top university rankings indicator. Although Germany (GII 12) performs the same as last year in these indicators, it drops one position in the innovation quality composite, primarily because of going from top position in citable documents abroad last year to 3rd in 2015.

Top 10 middle-income economies

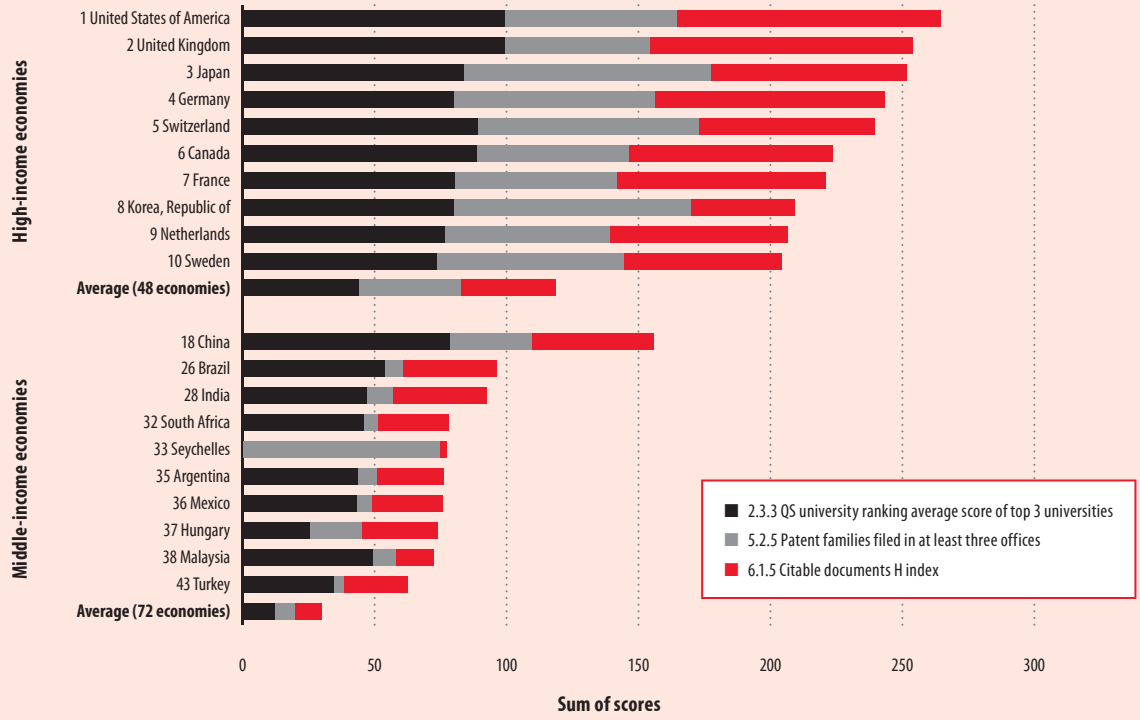
Following renewed domestic policy attention on ramping up innovation quality, China (GII 29) moves up to 18th position in the innovation quality ranking, retaining the top place among the middle-income economies and narrowing the gap that separates it from the high-income group. This upward movement can be attributed to its 1st place ranking among middle-income economies in the top university rankings (11th out of all GII economies) plus an improvement in the number of patents filed. Brazil (GII 70) and India (GII 81)—two of the four BRICS economies in this list—remain in 2nd and 3rd position, respectively, in the innovation quality composite ranking among the middle-income nations for the second consecutive year. Although both countries moved down in their overall GII ranking, their performance (similar to that of 2014 in all three quality indicators) has both kept them in the top 5 among middle-income economies and helped them move upwards in terms of the quality of innovation composite (26th and 28th, respectively). For India, this year's substantial improvement in patents filed also contributed to this performance. South Africa (GII 60) keeps its upward trajectory in innovation quality, moving into the 32nd composite position—4th among middle-income economies. Along with most of the other BRICS economies, it has also seen a drop in its GII rank this year but has retained its strong performance in innovation quality. Even though the Russian Federation (GII 48) is not among the top 10 high-income innovation quality performers, its sum of scores for these indicators this year is much better than most middle-income countries in the top 10. Its ranking for the combined indicators is 27, above that of India and South Africa.

With the exception of China and Hungary, whose innovation quality scores display a balance similar to that of high-income economies, the majority of middle-income economies still face a significant journey if they are to improve their innovation quality metrics. It is also noteworthy that even the innovation quality top performers depend heavily on their high university rankings to achieve their top-quality scores. More priority could be given to the calibre of publications and—the area in which middle-income countries show the weakest relative performance—to patents filed globally.

(Continued)

Box 3: Innovation quality: USA and China at the top, with a large gap between them *(cont'd.)*

Figure 3.1: Metrics for quality of innovation: Top 10 high- and top 10 middle-income economies



Notes: Numbers to the left of the economy name are the innovation quality rank. Economies are classified by income according to the World Bank Income Group Classification (July 2013). Upper- and lower-middle income categories were grouped together as middle-income economies.

the rest of the top 10 ranked in the composite. The gap between China and the other middle-income economies has consistently increased since 2013. Although India has also steadily improved its quality of innovation score, its improvement has not been as substantial as that of China. Brazil, on the other hand, has worsened in this metric, although the gap in score between India and Brazil has considerably reduced since 2013. South Africa has remained at constant levels, yet below all those of its BRICS peers.

2015 results: The world's top innovators

The following section describes and analyses the prominent features of the GII 2015 results for the global leaders in each index and the best performers in light of their income level.[24] A short discussion of the rankings at the regional level follows.[25]

Tables 1 through 3 present the rankings of all economies included in the GII 2015 for the GII and the Input and Output Sub-Indices.

The top 10 in the Global Innovation Index

The top 10 economies in the GII 2015 edition are discussed in detail below.

Switzerland maintains its number 1 position in the GII since 2011, as well as its number 1 position in the Output Sub-Index and in the Knowledge and technology outputs pillar since 2012. It achieves a spot among the top 25 in all pillars and sub-pillars with only four exceptions: sub-pillars Business environment (where it ranks 28th), Education (28th), Information and communication technologies (41st), and General infrastructure (26th). A knowledge-based economy of 8.1 million people with one of the highest GDP per capita in the world (PPP$47,863), its high Innovation Efficiency Ratio (2nd highest of all economies in the sample, and

Table 1: Global Innovation Index rankings

Country/Economy	Score (0–100)	Rank	Income	Rank	Region	Rank	Efficiency Ratio	Rank	Median: 0.71
Switzerland	68.30	**1**	HI	**1**	EUR	**1**	1.01	2	
United Kingdom	62.42	2	HI	2	EUR	2	0.86	18	
Sweden	62.40	3	HI	3	EUR	3	0.86	16	
Netherlands	61.58	4	HI	4	EUR	4	0.92	8	
United States of America	60.10	5	HI	5	NAC	**1**	0.79	33	
Finland	59.97	6	HI	6	EUR	5	0.77	41	
Singapore	59.36	7	HI	7	SEAO	**1**	0.65	100	
Ireland	59.13	8	HI	8	EUR	6	0.88	12	
Luxembourg	59.02	9	HI	9	EUR	7	1.00	3	
Denmark	57.70	10	HI	10	EUR	8	0.75	49	
Hong Kong (China)	57.23	11	HI	11	SEAO	2	0.69	76	
Germany	57.05	12	HI	12	EUR	9	0.87	13	
Iceland	57.02	13	HI	13	EUR	10	0.98	4	
Korea, Republic of	56.26	14	HI	14	SEAO	3	0.80	27	
New Zealand	55.92	15	HI	15	SEAO	4	0.77	40	
Canada	55.73	16	HI	16	NAC	2	0.71	70	
Australia	55.22	17	HI	17	SEAO	5	0.70	72	
Austria	54.07	18	HI	18	EUR	11	0.77	37	
Japan	53.97	19	HI	19	SEAO	6	0.69	78	
Norway	53.80	20	HI	20	EUR	12	0.73	63	
France	53.59	21	HI	21	EUR	13	0.75	51	
Israel	53.54	22	HI	22	NAWA	**1**	0.83	20	
Estonia	52.81	23	HI	23	EUR	14	0.86	17	
Czech Republic	51.32	24	HI	24	EUR	15	0.89	11	
Belgium	50.91	25	HI	25	EUR	16	0.74	59	
Malta	50.48	26	HI	26	EUR	17	0.95	7	
Spain	49.07	27	HI	27	EUR	18	0.72	67	
Slovenia	48.49	28	HI	28	EUR	19	0.82	22	
China	47.47	29	UM	**1**	SEAO	7	0.96	6	
Portugal	46.61	30	HI	29	EUR	20	0.73	62	
Italy	46.40	31	HI	30	EUR	21	0.74	57	
Malaysia	45.98	32	UM	2	SEAO	8	0.74	56	
Latvia	45.51	33	HI	31	EUR	22	0.81	26	
Cyprus	43.51	34	HI	32	NAWA	2	0.66	90	
Hungary	43.00	35	UM	3	EUR	23	0.78	35	
Slovakia	42.99	36	HI	33	EUR	24	0.76	48	
Barbados	42.47	37	HI	34	LCN	**1**	0.81	25	
Lithuania	42.26	38	HI	35	EUR	25	0.70	74	
Bulgaria	42.16	39	UM	4	EUR	26	0.83	21	
Croatia	41.70	40	HI	36	EUR	27	0.75	50	
Montenegro	41.23	41	UM	5	EUR	28	0.79	29	
Chile	41.20	42	HI	37	LCN	2	0.68	82	
Saudi Arabia	40.65	43	HI	38	NAWA	3	0.72	69	
Moldova, Republic of	40.53	44	LM	**1**	EUR	29	0.98	5	
Greece	40.28	45	HI	39	EUR	30	0.65	98	
Poland	40.16	46	HI	40	EUR	31	0.66	93	
United Arab Emirates	40.06	47	HI	41	NAWA	4	0.41	133	
Russian Federation	39.32	48	HI	42	EUR	32	0.74	60	
Mauritius	39.23	49	UM	6	SSF	**1**	0.65	96	
Qatar	39.01	50	HI	43	NAWA	5	0.61	110	
Costa Rica	38.59	51	UM	7	LCN	3	0.79	32	
Viet Nam	38.35	52	LM	2	SEAO	9	0.92	9	
Belarus	38.23	53	UM	8	EUR	33	0.70	73	
Romania	38.20	54	UM	9	EUR	34	0.74	58	
Thailand	38.10	55	UM	10	SEAO	10	0.76	43	
TFYR of Macedonia	38.03	56	UM	11	EUR	35	0.73	64	
Mexico	38.03	57	UM	12	LCN	4	0.73	61	
Turkey	37.81	58	UM	13	NAWA	6	0.81	23	
Bahrain	37.67	59	HI	44	NAWA	7	0.63	105	
South Africa	37.45	60	UM	14	SSF	2	0.66	94	
Armenia	37.31	61	LM	3	NAWA	8	0.79	34	
Panama	36.80	62	UM	15	LCN	5	0.78	36	
Serbia	36.47	63	UM	16	EUR	36	0.75	55	
Ukraine	36.45	64	LM	4	EUR	37	0.87	15	
Seychelles	36.44	65	UM	17	SSF	3	0.67	88	
Mongolia	36.41	66	LM	5	SEAO	11	0.61	111	
Colombia	36.41	67	UM	18	LCN	6	0.60	114	
Uruguay	35.76	68	HI	45	LCN	7	0.66	91	
Oman	35.00	69	HI	46	NAWA	9	0.67	86	
Brazil	34.95	70	UM	19	LCN	8	0.65	99	
Peru	34.87	71	UM	20	LCN	9	0.60	113	

Table 1: Global Innovation Index rankings *(continued)*

Country/Economy	Score (0–100)	Rank	Income	Rank	Region	Rank	Efficiency Ratio	Rank	Median: 0.71
Argentina	34.30	72	UM	21	LCN	10	0.75	52	
Georgia	33.83	73	LM	6	NAWA	10	0.62	107	
Lebanon	33.82	74	UM	22	NAWA	11	0.67	87	
Jordan	33.78	75	UM	23	NAWA	12	0.72	68	
Tunisia	33.48	76	UM	24	NAWA	13	0.71	71	
Kuwait	33.20	77	HI	47	NAWA	14	0.73	65	
Morocco	33.19	78	LM	7	NAWA	15	0.64	102	
Bosnia and Herzegovina	32.31	79	UM	25	EUR	38	0.39	135	
Trinidad and Tobago	32.18	80	HI	48	LCN	11	0.66	92	
India	31.74	81	LM	8	CSA	**1**	0.79	31	
Kazakhstan	31.25	82	UM	26	CSA	2	0.53	124	
Philippines	31.05	83	LM	9	SEAO	12	0.76	44	
Senegal	30.95	84	LM	10	SSF	4	0.81	24	
Sri Lanka	30.79	85	LM	11	CSA	3	0.76	46	
Guyana	30.75	86	LM	12	LCN	12	0.65	95	
Albania	30.74	87	UM	27	EUR	39	0.49	129	
Paraguay	30.69	88	LM	13	LCN	13	0.75	54	
Dominican Republic	30.60	89	UM	28	LCN	14	0.61	108	
Botswana	30.49	90	UM	29	SSF	5	0.54	120	
Cambodia	30.35	91	LI	**1**	SEAO	13	0.69	80	
Kenya	30.19	92	LI	2	SSF	6	0.79	30	
Azerbaijan	30.10	93	UM	30	NAWA	16	0.60	115	
Rwanda	30.09	94	LI	3	SSF	7	0.42	131	
Mozambique	30.07	95	LI	4	SSF	8	0.63	104	
Jamaica	29.95	96	UM	31	LCN	15	0.54	121	
Indonesia	29.79	97	LM	14	SEAO	14	0.77	42	
Malawi	29.71	98	LI	5	SSF	9	0.75	53	
El Salvador	29.31	99	LM	15	LCN	16	0.62	106	
Egypt	28.91	100	LM	16	NAWA	17	0.68	83	
Guatemala	28.84	101	LM	17	LCN	17	0.67	89	
Burkina Faso	28.68	102	LI	6	SSF	10	0.68	85	
Cabo Verde	28.59	103	LM	18	SSF	11	0.54	119	
Bolivia, Plurinational State of	28.58	104	LM	19	LCN	18	0.76	45	
Mali	28.37	105	LI	7	SSF	12	0.87	14	
Iran, Islamic Republic of	28.37	106	UM	32	CSA	4	0.63	103	
Namibia	28.15	107	UM	33	SSF	13	0.51	126	
Ghana	28.04	108	LM	20	SSF	14	0.69	79	
Kyrgyzstan	27.96	109	LM	21	CSA	5	0.53	122	
Cameroon	27.80	110	LM	22	SSF	15	0.84	19	
Uganda	27.65	111	LI	8	SSF	16	0.57	118	
Gambia	27.49	112	LI	9	SSF	17	0.77	39	
Honduras	27.48	113	LM	23	LCN	19	0.57	117	
Tajikistan	27.46	114	LI	10	CSA	6	0.65	101	
Fiji	27.31	115	UM	34	SEAO	15	0.28	140	
Côte d'Ivoire	27.16	116	LM	24	SSF	18	0.90	10	
Tanzania, United Republic of	27.00	117	LI	11	SSF	19	0.77	38	
Lesotho	26.97	118	LM	25	SSF	20	0.50	128	
Ecuador	26.87	119	UM	35	LCN	20	0.51	127	
Angola	26.20	120	UM	36	SSF	21	1.02	1	
Bhutan	26.06	121	LM	26	CSA	7	0.33	138	
Uzbekistan	25.89	122	LM	27	CSA	8	0.53	123	
Swaziland	25.37	123	LM	28	SSF	22	0.42	132	
Zambia	24.64	124	LM	29	SSF	23	0.68	81	
Madagascar	24.42	125	LI	12	SSF	24	0.59	116	
Algeria	24.38	126	UM	37	NAWA	18	0.52	125	
Ethiopia	24.17	127	LI	13	SSF	25	0.72	66	
Nigeria	23.72	128	LM	30	SSF	26	0.80	28	
Bangladesh	23.71	129	LI	14	CSA	9	0.61	112	
Nicaragua	23.47	130	LM	31	LCN	21	0.47	130	
Pakistan	23.07	131	LM	32	CSA	10	0.76	47	
Venezuela, Bolivarian Republic of	22.77	132	UM	38	LCN	22	0.68	84	
Zimbabwe	22.52	133	LI	15	SSF	27	0.69	77	
Niger	21.22	134	LI	16	SSF	28	0.29	139	
Nepal	21.08	135	LI	17	CSA	11	0.40	134	
Burundi	21.04	136	LI	18	SSF	29	0.36	137	
Yemen	20.80	137	LM	33	NAWA	19	0.65	97	
Myanmar	20.27	138	LI	19	SEAO	16	0.69	75	
Guinea	18.49	139	LI	20	SSF	30	0.61	109	
Togo	18.43	140	LI	21	SSF	31	0.24	141	
Sudan	14.95	141	LM	34	SSF	32	0.37	136	

Note: World Bank Income Group Classification (July 2013): LI = low income; LM = lower-middle income; UM = upper-middle income; and HI = high income. Regions are based on the United Nations Classification: EUR = Europe; NAC = Northern America; LCN = Latin America and the Caribbean; CSA = Central and Southern Asia; SEAO = South East Asia and Oceania; NAWA = Northern Africa and Western Asia; SSF = Sub-Saharan Africa.

Table 2: Innovation Input Sub-Index rankings

Country/Economy	Score (0–100)	Rank	Income	Rank	Region	Rank	Median: 41.68
Singapore	72.12	**1**	HI	**1**	SEAO	**1**	
Switzerland	67.96	2	HI	2	EUR	**1**	
Finland	67.91	3	HI	3	EUR	2	
Hong Kong (China)	67.61	4	HI	4	SEAO	2	
United States of America	67.31	5	HI	5	NAC	**1**	
United Kingdom	67.15	6	HI	6	EUR	3	
Sweden	67.01	7	HI	7	EUR	4	
Denmark	65.87	8	HI	8	EUR	5	
Canada	65.05	9	HI	9	NAC	2	
Australia	64.84	10	HI	10	SEAO	3	
Netherlands	64.23	11	HI	11	EUR	6	
Japan	63.83	12	HI	12	SEAO	4	
New Zealand	63.14	13	HI	13	SEAO	5	
Ireland	62.90	14	HI	14	EUR	7	
Korea, Republic of	62.37	15	HI	15	SEAO	6	
Norway	62.18	16	HI	16	EUR	8	
France	61.25	17	HI	17	EUR	9	
Germany	60.99	18	HI	18	EUR	10	
Austria	60.95	19	HI	19	EUR	11	
Luxembourg	59.02	20	HI	20	EUR	12	
Belgium	58.61	21	HI	21	EUR	13	
Israel	58.50	22	HI	22	NAWA	**1**	
Iceland	57.48	23	HI	23	EUR	14	
Spain	57.00	24	HI	24	EUR	15	
United Arab Emirates	56.85	25	HI	25	NAWA	2	
Estonia	56.78	26	HI	26	EUR	16	
Czech Republic	54.18	27	HI	27	EUR	17	
Portugal	53.80	28	HI	28	EUR	18	
Italy	53.38	29	HI	29	EUR	19	
Slovenia	53.22	30	HI	30	EUR	20	
Malaysia	52.78	31	UM	**1**	SEAO	7	
Cyprus	52.35	32	HI	31	NAWA	3	
Malta	51.81	33	HI	32	EUR	21	
Latvia	50.41	34	HI	33	EUR	22	
Lithuania	49.86	35	HI	34	EUR	23	
Chile	48.96	36	HI	35	LCN	**1**	
Slovakia	48.93	37	HI	36	EUR	24	
Greece	48.81	38	HI	37	EUR	25	
Poland	48.44	39	HI	38	EUR	26	
Qatar	48.42	40	HI	39	NAWA	4	
China	48.36	41	UM	2	SEAO	8	
Hungary	48.25	42	UM	3	EUR	27	
Croatia	47.65	43	HI	40	EUR	28	
Mauritius	47.49	44	UM	4	SSF	**1**	
Saudi Arabia	47.31	45	HI	41	NAWA	5	
Barbados	46.94	46	HI	42	LCN	2	
Bosnia and Herzegovina	46.42	47	UM	5	EUR	29	
Bahrain	46.24	48	HI	43	NAWA	6	
Bulgaria	46.10	49	UM	6	EUR	30	
Montenegro	45.94	50	UM	7	EUR	31	
Colombia	45.44	51	UM	8	LCN	3	
Russian Federation	45.33	52	HI	44	EUR	32	
Mongolia	45.23	53	LM	**1**	SEAO	9	
South Africa	45.19	54	UM	10	SSF	2	
Belarus	44.91	55	UM	11	EUR	33	
TFYR of Macedonia	43.99	56	UM	12	EUR	34	
Romania	43.95	57	UM	13	EUR	35	
Mexico	43.87	58	UM	14	LCN	4	
Seychelles	43.68	59	UM	15	SSF	3	
Peru	43.50	60	UM	16	LCN	5	
Costa Rica	43.21	61	UM	17	LCN	6	
Thailand	43.17	62	UM	18	SEAO	10	
Uruguay	43.06	63	HI	45	LCN	7	
Fiji	42.61	64	UM	19	SEAO	11	
Brazil	42.38	65	UM	20	LCN	8	
Rwanda	42.33	66	LI	**1**	SSF	4	
Georgia	41.84	67	LM	2	NAWA	7	
Oman	41.83	68	HI	46	NAWA	8	
Armenia	41.79	69	LM	3	NAWA	9	
Serbia	41.78	70	UM	21	EUR	36	
Turkey	41.68	71	UM	22	NAWA	10	

Table 2: Innovation Input Sub-Index rankings *(continued)*

Country/Economy	Score (0–100)	Rank	Income	Rank	Region	Rank	Median: 41.68
Panama	41.40	72	UM	23	LCN	9	
Albania	41.22	73	UM	24	EUR	37	
Moldova, Republic of	40.99	74	LM	4	EUR	38	
Kazakhstan	40.98	75	UM	25	CSA	1	
Morocco	40.55	76	LM	5	NAWA	11	
Lebanon	40.53	77	UM	26	NAWA	12	
Viet Nam	40.04	78	LM	6	SEAO	12	
Botswana	39.63	79	UM	27	SSF	5	
Jordan	39.29	80	UM	28	NAWA	13	
Argentina	39.22	81	UM	29	LCN	10	
Bhutan	39.20	82	LM	7	CSA	2	
Tunisia	39.10	83	UM	30	NAWA	14	
Ukraine	39.06	84	LM	8	EUR	39	
Jamaica	38.93	85	UM	31	LCN	11	
Trinidad and Tobago	38.80	86	HI	47	LCN	12	
Kuwait	38.44	87	HI	48	NAWA	15	
Dominican Republic	37.92	88	UM	32	LCN	13	
Azerbaijan	37.59	89	UM	33	NAWA	16	
Guyana	37.21	90	LM	9	LCN	14	
Namibia	37.18	91	UM	34	SSF	6	
Cabo Verde	37.13	92	LM	10	SSF	7	
Mozambique	36.86	93	LI	2	SSF	8	
Kyrgyzstan	36.57	94	LM	11	CSA	3	
El Salvador	36.18	95	LM	12	LCN	15	
Cambodia	35.98	96	LI	3	SEAO	13	
Lesotho	35.93	97	LM	13	SSF	9	
Swaziland	35.71	98	LM	14	SSF	10	
Ecuador	35.63	99	UM	35	LCN	16	
India	35.51	100	LM	15	CSA	4	
Philippines	35.24	101	LM	16	SEAO	14	
Uganda	35.17	102	LI	4	SSF	11	
Paraguay	35.15	103	LM	17	LCN	17	
Sri Lanka	35.01	104	LM	18	CSA	5	
Honduras	34.94	105	LM	19	LCN	18	
Iran, Islamic Republic of	34.75	106	UM	36	CSA	6	
Guatemala	34.62	107	LM	20	LCN	19	
Egypt	34.42	108	LM	21	NAWA	17	
Burkina Faso	34.20	109	LI	5	SSF	12	
Senegal	34.13	110	LM	22	SSF	13	
Malawi	34.00	111	LI	6	SSF	14	
Uzbekistan	33.88	112	LM	23	CSA	7	
Kenya	33.75	113	LI	7	SSF	15	
Indonesia	33.74	114	LM	24	SEAO	15	
Tajikistan	33.39	115	LI	8	CSA	8	
Ghana	33.22	116	LM	25	SSF	16	
Niger	32.87	117	LI	9	SSF	17	
Bolivia, Plurinational State of	32.49	118	LM	26	LCN	20	
Algeria	32.08	119	UM	37	NAWA	18	
Nicaragua	31.94	120	LM	27	LCN	21	
Gambia	31.03	121	LI	10	SSF	18	
Burundi	30.96	122	LI	11	SSF	19	
Madagascar	30.66	123	LI	12	SSF	20	
Tanzania, United Republic of	30.45	124	LI	13	SSF	21	
Mali	30.37	125	LI	14	SSF	22	
Cameroon	30.19	126	LM	28	SSF	23	
Nepal	30.02	127	LI	15	CSA	9	
Togo	29.65	128	LI	16	SSF	24	
Bangladesh	29.48	129	LI	17	CSA	10	
Zambia	29.26	130	LM	29	SSF	25	
Côte d'Ivoire	28.57	131	LM	30	SSF	26	
Ethiopia	28.04	132	LI	18	SSF	27	
Venezuela, Bolivarian Republic of	27.15	133	UM	38	LCN	22	
Zimbabwe	26.61	134	LI	19	SSF	28	
Nigeria	26.30	135	LM	31	SSF	29	
Pakistan	26.25	136	LM	32	CSA	11	
Angola	25.91	137	UM	39	SSF	30	
Yemen	25.20	138	LM	33	NAWA	19	
Myanmar	23.92	139	LI	20	SEAO	16	
Guinea	22.92	140	LI	21	SSF	31	
Sudan	21.90	141	LM	34	SSF	32	

Note: World Bank Income Group Classification (July 2013): LI = low income; LM = lower-middle income; UM = upper-middle income; and HI = high income. Regions are based on the United Nations Classification: EUR = Europe; NAC = Northern America; LCN = Latin America and the Caribbean; CSA = Central and Southern Asia; SEAO = South East Asia and Oceania; NAWA = Northern Africa and Western Asia; SSF = Sub-Saharan Africa.

Table 3: Innovation Output Sub-Index rankings

Country/Economy	Score (0–100)	Rank	Income	Rank	Region	Rank	Median: 27.86
Switzerland	68.63	1	HI	1	EUR	1	
Luxembourg	59.02	2	HI	2	EUR	2	
Netherlands	58.93	3	HI	3	EUR	3	
Sweden	57.78	4	HI	4	EUR	4	
United Kingdom	57.70	5	HI	5	EUR	5	
Iceland	56.56	6	HI	6	EUR	6	
Ireland	55.37	7	HI	7	EUR	7	
Germany	53.11	8	HI	8	EUR	8	
United States of America	52.89	9	HI	9	NAC	1	
Finland	52.04	10	HI	10	EUR	9	
Korea, Republic of	50.15	11	HI	11	SEAO	1	
Denmark	49.53	12	HI	12	EUR	10	
Malta	49.16	13	HI	13	EUR	11	
Estonia	48.83	14	HI	14	EUR	12	
New Zealand	48.71	15	HI	15	SEAO	2	
Israel	48.59	16	HI	16	NAWA	1	
Czech Republic	48.46	17	HI	17	EUR	13	
Austria	47.19	18	HI	18	EUR	14	
Hong Kong (China)	46.86	19	HI	19	SEAO	3	
Singapore	46.60	20	HI	20	SEAO	4	
China	46.57	21	UM	1	SEAO	5	
Canada	46.42	22	HI	21	NAC	2	
France	45.93	23	HI	22	EUR	15	
Australia	45.61	24	HI	23	SEAO	6	
Norway	45.43	25	HI	24	EUR	16	
Japan	44.10	26	HI	25	SEAO	7	
Slovenia	43.77	27	HI	26	EUR	17	
Belgium	43.22	28	HI	27	EUR	18	
Spain	41.14	29	HI	28	EUR	19	
Latvia	40.60	30	HI	29	EUR	20	
Moldova, Republic of	40.06	31	LM	1	EUR	21	
Italy	39.41	32	HI	30	EUR	22	
Portugal	39.41	33	HI	31	EUR	23	
Malaysia	39.18	34	UM	2	SEAO	8	
Bulgaria	38.23	35	UM	3	EUR	24	
Barbados	38.00	36	HI	32	LCN	1	
Hungary	37.74	37	UM	4	EUR	25	
Slovakia	37.05	38	HI	33	EUR	26	
Viet Nam	36.65	39	LM	2	SEAO	9	
Montenegro	36.52	40	UM	5	EUR	27	
Croatia	35.75	41	HI	34	EUR	28	
Lithuania	34.66	42	HI	35	EUR	29	
Cyprus	34.66	43	HI	36	NAWA	2	
Saudi Arabia	33.99	44	HI	37	NAWA	3	
Costa Rica	33.96	45	UM	6	LCN	2	
Turkey	33.93	46	UM	7	NAWA	4	
Ukraine	33.85	47	LM	3	EUR	30	
Chile	33.45	48	HI	38	LCN	3	
Russian Federation	33.32	49	HI	39	EUR	31	
Thailand	33.02	50	UM	8	SEAO	10	
Armenia	32.83	51	LM	4	NAWA	5	
Romania	32.45	52	UM	9	EUR	32	
Panama	32.20	53	UM	10	LCN	4	
Mexico	32.19	54	UM	11	LCN	5	
TFYR of Macedonia	32.07	55	UM	12	EUR	33	
Poland	31.87	56	HI	40	EUR	34	
Greece	31.75	57	HI	41	EUR	35	
Belarus	31.55	58	UM	13	EUR	36	
Serbia	31.16	59	UM	14	EUR	37	
Mauritius	30.98	60	UM	15	SSF	1	
South Africa	29.70	61	UM	16	SSF	2	
Qatar	29.60	62	HI	42	NAWA	6	
Argentina	29.38	63	UM	17	LCN	6	
Seychelles	29.21	64	UM	18	SSF	3	
Bahrain	29.10	65	HI	43	NAWA	7	
Uruguay	28.45	66	HI	44	LCN	7	
Jordan	28.26	67	UM	19	NAWA	8	
Oman	28.16	68	HI	45	NAWA	9	
India	27.97	69	LM	5	CSA	1	
Kuwait	27.96	70	HI	46	NAWA	10	
Tunisia	27.86	71	UM	20	NAWA	11	

Table 3: Innovation Output Sub-Index rankings *(continued)*

Country/Economy	Score (0–100)	Rank	Income	Rank	Region	Rank	Median: 27.86
Senegal	27.77	72	LM	6	SSF	4	
Mongolia	27.59	73	LM	7	SEAO	11	
Brazil	27.52	74	UM	21	LCN	8	
Colombia	27.37	75	UM	22	LCN	9	
Lebanon	27.11	76	UM	23	NAWA	12	
Philippines	26.86	77	LM	8	SEAO	12	
Kenya	26.64	78	LI	**1**	SSF	5	
Sri Lanka	26.56	79	LM	9	CSA	2	
Angola	26.49	80	UM	24	SSF	6	
Mali	26.37	81	LI	2	SSF	7	
Peru	26.24	82	UM	25	LCN	10	
Paraguay	26.22	83	LM	10	LCN	11	
Morocco	25.84	84	LM	11	NAWA	13	
Indonesia	25.83	85	LM	12	SEAO	13	
Georgia	25.81	86	LM	13	NAWA	14	
Côte d'Ivoire	25.74	87	LM	14	SSF	8	
Trinidad and Tobago	25.55	88	HI	47	LCN	12	
Malawi	25.42	89	LI	3	SSF	9	
Cameroon	25.40	90	LM	15	SSF	10	
Cambodia	24.72	91	LI	4	SEAO	14	
Bolivia, Plurinational State of	24.68	92	LM	16	LCN	13	
Guyana	24.28	93	LM	17	LCN	14	
Gambia	23.95	94	LI	5	SSF	11	
Tanzania, United Republic of	23.56	95	LI	6	SSF	12	
Egypt	23.39	96	LM	18	NAWA	15	
Mozambique	23.29	97	LI	7	SSF	13	
Dominican Republic	23.28	98	UM	26	LCN	15	
United Arab Emirates	23.27	99	HI	48	NAWA	16	
Burkina Faso	23.16	100	LI	8	SSF	14	
Guatemala	23.06	101	LM	19	LCN	16	
Ghana	22.86	102	LM	20	SSF	15	
Azerbaijan	22.62	103	UM	27	NAWA	17	
El Salvador	22.43	104	LM	21	LCN	17	
Iran, Islamic Republic of	21.99	105	UM	28	CSA	3	
Tajikistan	21.54	106	LI	9	CSA	4	
Kazakhstan	21.52	107	UM	29	CSA	5	
Botswana	21.35	108	UM	30	SSF	16	
Nigeria	21.15	109	LM	22	SSF	17	
Jamaica	20.97	110	UM	31	LCN	18	
Ethiopia	20.29	111	LI	10	SSF	18	
Albania	20.26	112	UM	32	EUR	38	
Uganda	20.13	113	LI	11	SSF	19	
Cabo Verde	20.05	114	LM	23	SSF	20	
Zambia	20.02	115	LM	24	SSF	21	
Honduras	20.01	116	LM	25	LCN	19	
Pakistan	19.90	117	LM	26	CSA	6	
Kyrgyzstan	19.35	118	LM	27	CSA	7	
Namibia	19.11	119	UM	33	SSF	22	
Zimbabwe	18.42	120	LI	12	SSF	23	
Venezuela, Bolivarian Republic of	18.40	121	UM	34	LCN	20	
Bosnia and Herzegovina	18.21	122	UM	35	EUR	39	
Madagascar	18.17	123	LI	13	SSF	24	
Ecuador	18.11	124	UM	36	LCN	21	
Lesotho	18.01	125	LM	28	SSF	25	
Bangladesh	17.94	126	LI	14	CSA	8	
Uzbekistan	17.89	127	LM	29	CSA	9	
Rwanda	17.85	128	LI	15	SSF	26	
Algeria	16.68	129	UM	37	NAWA	18	
Myanmar	16.62	130	LI	16	SEAO	15	
Yemen	16.41	131	LM	30	NAWA	19	
Swaziland	15.03	132	LM	31	SSF	27	
Nicaragua	15.00	133	LM	32	LCN	22	
Guinea	14.06	134	LI	17	SSF	28	
Bhutan	12.93	135	LM	33	CSA	10	
Nepal	12.14	136	LI	18	CSA	11	
Fiji	12.01	137	UM	38	SEAO	16	
Burundi	11.13	138	LI	19	SSF	29	
Niger	9.57	139	LI	20	SSF	30	
Sudan	8.00	140	LM	34	SSF	31	
Togo	7.20	141	LI	21	SSF	32	

Note: World Bank Income Group Classification (July 2013): LI = low income; LM = lower-middle income; UM = upper-middle income; and HI = high income. Regions are based on the United Nations Classification: EUR = Europe; NAC = Northern America; LCN = Latin America and the Caribbean; CSA = Central and Southern Asia; SEAO = South East Asia and Oceania; NAWA = Northern Africa and Western Asia; SSF = Sub-Saharan Africa.

1st among the GII top 10) allows Switzerland to translate its robust innovation capabilities into high-level innovation outputs.

The runner-up, **the United Kingdom** (UK), keeps its position from last year after a strong rise from 10th in 2011 to 2nd in 2014 and 2015, with strengths in both its innovation inputs (6th) and outputs (5th). The UK places within the top 25 in all pillars and sub-pillars with only three exceptions: sub-pillars General infrastructure (48th), Knowledge absorption (30th), and Intangible assets (31st). Although it keeps its 2nd place in the overall GII rankings, the UK improves its ranking in the Human capital and research pillar (by three places) and Creative outputs (two places). Conversely, it slightly worsens in the Knowledge and technology outputs pillar (three places), with the remaining pillars moving up or down by only one place. The UK has strengths in all pillars except Institutions and ranks 1st in two of the three innovation quality indicators (see Box 3). Its weaknesses are mainly in the areas of education, investment, and productivity—for example, in graduates in science and engineering (39th), the pupil-teacher ratio for secondary education (56th), gross capital formation (122nd), and the growth rate of GDP per person engaged (78th), as well as in domestic trademark applications (50th).

The stability in the top three continues with **Sweden** in 3rd place, leading the Nordic countries. It achieves positions among the top 25 in all pillars, ranking 4th in overall outputs (2nd in Knowledge and technology outputs and 11th in Creative outputs), and in all sub-pillars with the exception of Trade and competition (28th) and Knowledge impact (28th). Sweden has improved its ranking by two places in two of the seven GII pillars: Human capital and research (4th), notably in the quality of its universities; and Business sophistication (7th), notably in the areas of knowledge workers and knowledge absorption. Sweden also drops three places in Infrastructure (7th)—in part as a result of the methodological changes of the UNPAN data on Government online service and E-participation data,[26] as well as five places in Market sophistication (14th) and two in Creative outputs (11th).

The Netherlands is ranked 4th in the GII this year (up from 5th in 2014), and is 3rd in the Output Sub-Index and 11th in the Input Sub-Index. It achieves positions among the top 25 in all pillars, improving the most in Human capital and research (by five places to reach 17th) and Knowledge and technology outputs (by three places to 6th). Its weakest showing is in Market sophistication at 17th place, which, however, also improved by two places this year. At the indicator level, the Netherlands ranks the strongest in the online e-participation index (1st), the logistics performance index (2nd), royalties and license fee payments and receipts (1st and 2nd places, respectively), and country-code top level domains (1st). Some of its major weaknesses (measured in percent ranks to take account of missing values) are in the Tertiary education sub-pillar, with a low number of tertiary graduates in science and engineering, and in the ease of starting a business, ease of protecting investors, joint venture/strategic alliance deals, and the cultural and creative services exports variables.

The United States of America (USA) is ranked 5th, up one spot from 6th in 2014, coming in 5th in inputs and 9th in outputs. The USA keeps its 1st place position in the Market sophistication pillar and Credit sub-pillar and has leading positions (within the top 25) for the rest of the pillars and 16 of the 21 sub-pillars. It also comes 1st in 7 of the 74 indicators with available data, including the cost of redundancy dismissal, total value of stocks traded, national office patent applications, citable documents H index, total computer software spending, generic top-level domains, and video uploads on YouTube. A weaker performance is seen in the number of ISO 14001 environmental certificates (96th), ISO 9001 quality certificates (90th), gross capital formation (89th), growth rate of GDP per person engaged (79th), GDP per unit of energy use (76th), number of graduates in science and engineering (75th), and GERD financed by business abroad (72nd).

Finland ranks 6th, down two positions from 2014, as a result of worsening in the Infrastructure pillar by eight places, Knowledge and technology outputs by three places, and Creative outputs by five places. However, it still ranks 1st in both Institutions and Human capital and research. Finland falls more than five places in the ICTs—notably also the consequence of a change of the methodology underlying the Government online service and e-participation data of UNPAN,[27] as well as dropping in the Knowledge diffusion and Creative goods and services sub-pillars. Conversely, Finland improves by more than five places in the Trade and competition and Knowledge absorption sub-pillars. The improvement in Knowledge absorption is mainly the result of other countries performing worse in this sub-pillar, lifting Finland up. Its loss of three positions in Knowledge and technology outputs is partly caused by lower high-tech and ICT services exports, which is potentially linked to the

lesser prominence of the ICT firm Nokia.

Singapore maintains its 2014 position at 7th place, the top-ranked country in the South East Asia and Oceania region. Singapore ranks 1st in innovation inputs (because of its 1st place in the Infrastructure and Business sophistication pillars and 2nd place in the Institutions pillar), yet it ranks 20th in innovation outputs, thus achieving quite a low ranking in innovation efficiency (100th). Singapore remains consistent across most areas of the GII, but with some notable progress in the Political environment (where it improves by 15 places), Ecological sustainability (9 places), Knowledge impact (5 places), and Knowledge diffusion (11 places) sub-pillars. Although the improvement in Political environment is the result of the removal of the press freedom index variable this year (see Annex 2), Singapore greatly improves in the GDP per unit of energy use variable, the growth rate of GDP per person engaged variable, and most of the variables in sub-pillar 6.3, Knowledge diffusion. Conversely, Singapore declines in the Investment (down four places), Trade and competition (six places), and Knowledge creation sub-pillars (five places).

Ireland is ranked 8th in 2015 (up three places from 2014) and is back in the top 10 for the second time. This improvement is attributable to a much improved innovation efficiency ranking (from 47th to 12th), a consequence of strengthening its innovation outputs (from 11th place in 2014 to 7th place in 2015). Ireland ranks in the top 25 across all pillars, with its biggest progress in Infrastructure (14 places) and Creative outputs (7 places). These pillar improvements are the result of significant improvement in all variables within the Ecological sustainability and Intangible assets sub-pillars.[28] Conversely, Ireland worsens slightly in Institutions (six places), Human capital and research (two places), Market sophistication (six places), and Business sophistication (one place). At the variable level, some of Ireland's weaknesses are the cost of redundancy dismissal, total value of stocks traded, intensity of local competition, high-tech imports, national office patent applications, and cultural and creative services exports.

Luxembourg maintains its 9th place position while improving its innovation output ranking to 2nd place (from 5th in 2014) and its innovation efficiency ranking to 3rd place (from 9th in 2014). It greatly improved in the Market sophistication pillar by 28 places, mainly because of improvements made in the Investment and Trade and competition sub-pillars. This is the result of an increased number of venture capital deals and the removal of the non-agricultural market access weighted tariff indicator from the GII model. The rest of Luxembourg's performance in the GII this year remains relatively stable with the exception of Human capital and research, where it drops from 27nd place in 2014 to 34th. This is the consequence of a drop in both the amount of government expenditure per pupil in secondary education and the number of graduates in science and engineering. Identified strengths include ICT access, environmental performance, employment in knowledge-intensive services, joint venture deals, and cultural and creative services exports.

Denmark is ranked 10th, down two positions from 8th place in 2014. This fall is similar to that of Finland, and—except for Sweden—there has been a noticeable decrease in the GII innovation performance of the Nordic European countries since 2011. Despite this decline, the country performs strongly in both the Input Sub-Index (at 8th place) and the Output Sub-Index (12th). It achieves a leading position (within the top 25) in all pillars and in 14 out of 21 sub-pillars, with strengths in its government effectiveness, regulatory quality, rule of law, school life expectancy, number of researchers, ICT use, and number of scientific and technical publications. Denmark's several steep drops in 2015 are mainly in the Infrastructure pillar in areas such as the government's online index and e-participation index,[29] GDP per unit of energy use, and the number of ISO 14001 certificates.

The top 10 in the Innovation Input Sub-Index

The Innovation Input Sub-Index considers the elements of an economy that enable innovative activity through five pillars. The top 10 economies in the Innovation Input Sub-Index are Singapore, Switzerland, Finland, Hong Kong (China), the USA, the UK, Sweden, Denmark, Canada, and Australia. Hong Kong (China), Canada, and Australia are the only economies in this group that are not also in the GII top 10.

Hong Kong (China) is ranked 11th in the GII overall, down from 10th in 2014. However, it ranks 4th in the Input Sub-Index, with top 10 rankings in the Institutions (8th), Infrastructure (2nd), and Market sophistication (2nd) input pillars. It also ranks 8th in Creative outputs. Hong Kong (China)'s biggest strengths in the input variables are in regulatory quality, GDP per unit of energy use, domestic credit to private sector, ease of protecting investors, market capitalization,

intensity of local competition, and high-tech imports. Its biggest drop this year is in Business sophistication (where it falls by nine places to 15th) and in the Knowledge workers sub-pillar, mainly the result of its performance in the percentage of females employed with advanced degrees.[30] Hong Kong (China)'s biggest improvement is in the Knowledge and technology output pillar (it improves by 14 places to 31st place) in all sub-pillars and most variables.

Canada is ranked 16th, down from 12th in 2014 and 11th in 2013. It ranks 9th in the Input Sub-Index, with top 10 rankings on the Institutions pillar (6th)—linked to its strong performance (1st) in the Business environment sub-pillar—and the Market sophistication pillar (4th), the result of a robust performance in the Investment (5th) and Credit (9th) sub-pillars. Canada's decline is mostly the result of its drop in the Human capital and research pillar, from 13th in 2014 to 22nd this year. Its main weakness in this pillar is linked to government expenditure on secondary education per pupil, where it ranks 65th.

Australia maintains its 17th place overall GII rank and 10th place rank in the Input Sub-Index from 2014. It also maintains its top 10 rankings in three pillars: Human capital and research (9th), Infrastructure (4th), and Market sophistication (9th). It improves by three places in the Infrastructure pillar across two sub-pillars: ICTs (7th) and Ecological sustainability (27th). It also improves in Business sophistication by three places to 23rd, as a result of improvements made in two sub-pillars: Knowledge workers and Innovation linkages. In relation to innovation outputs, Australia also improved in Creative outputs by five places to 7th place, with improvements within all three sub-pillars. Australia's main falls take place in Human capital and research (down two places) and Knowledge and technology outputs (down eight places).

The top 10 in the Innovation Output Sub-Index

The Innovation Output Sub-Index variables provide information on elements that are the result of innovation within an economy. Although scores on the Input and Output Sub-Indices might differ substantially, leading to important shifts in rankings from one sub-index to the other for particular countries, the data confirm that efforts made to improve enabling environments are rewarded with increased innovation outputs.

The top 10 countries in the Innovation Output Sub-Index this year are Switzerland, Luxembourg, the Netherlands, Sweden, the UK, Iceland, Ireland, Germany, the USA, and Finland. Ireland enters the list this year (ranked 11th in 2014), while Malta drops to 13th place. Eight of these countries are already in the GII top 10; the profiles of the other two economies are discussed below.

Iceland is ranked 13th in the GII overall, up six positions from 19th in 2014. This Nordic country ranks 23th in the Input Sub-Index and 6th in the Output Sub-Index. While the main leverage on the output side comes from its consistent 1st place in Creative outputs, where Iceland shows strengths in all sub-pillars and most indicators, it also shows great progress in the Knowledge and technology outputs sub-pillar (with an improvement of 12 places to reach 24th). This advance is linked to a substantial improvement in FDI net outflows.[31] In addition, notable developments have been made in the percentage of graduates in science and engineering (18 places), its performance in the e-participation index (15 places), and ease of protecting investors (14 places). Notable weaknesses for Iceland are its high-tech imports (100th), growth rate of labour productivity (103rd), high-tech and medium-high-tech output (85th), and creative goods exports (92nd).

Germany is ranked 12th in the overall GII, up one place from 2014. As has been the case for the past three years, Germany's relative strengths lies in the Output Sub-Index (8th), although it ranks a respectable 18th in the Input Sub-Index and shows a balanced profile, with pillar rankings ranging from 10th to 22nd. All sub-pillars rank among the top 40 with the exception of Investment (59th) and Creative goods and services (43rd). Germany's output strengths are attributable to its 1st place ranking in national office patent applications and country-code top-level domains, its 3rd place in the citable documents H index, and its 5th position in high-tech and medium-high-tech output.

Top performers by income group

Viewing economies among their income-group peers can illustrate important relative competitive advantages and help decision makers glean important lessons for improved performance that are applicable on the ground. This report attempts to abide by this underlying principle by assessing results on the basis of the development stages of countries.

Table 4 shows the 10 best performers in each index by income group. The top 28 positions in the GII are taken by high-income economies, the same number as in 2014. Switzerland, the UK, Sweden, and the USA are among the high-income top 10 on the three main indices, while Switzerland is the

Table 4: Ten best-ranked economies by income group (rank)

	Global Innovation Index	Innovation Input Sub-index	Innovation Output Sub-index	Innovation Efficiency Ratio
High-income economies (48 in total)				
1	**Switzerland (1)**	Singapore (1)	**Switzerland (1)**	**Switzerland (2)**
2	**United Kingdom (2)**	**Switzerland (2)**	Luxembourg (2)	Luxembourg (3)
3	**Sweden (3)**	**Finland (3)**	Netherlands (3)	Iceland (4)
4	Netherlands (4)	Hong Kong (China) (4)	**Sweden (4)**	Malta (7)
5	**United States of America (5)**	**United States of America (5)**	**United Kingdom (5)**	Netherlands (8)
6	**Finland (6)**	**United Kingdom (6)**	Iceland (6)	Czech Republic (11)
7	Singapore (7)	**Sweden (7)**	Ireland (7)	Ireland (12)
8	Ireland (8)	Denmark (8)	Germany (8)	Germany (13)
9	Luxembourg (9)	Canada (9)	**United States of America (9)**	**Sweden (16)**
10	Denmark (10)	Australia (10)	**Finland (10)**	Estonia (17)
Upper-middle-income economies (38 in total)				
1	**China (29)**	**Malaysia (31)**	**China (21)**	Angola (1)
2	**Malaysia (32)**	**China (41)**	**Malaysia (34)**	**China (6)**
3	**Hungary (35)**	**Hungary (42)**	**Bulgaria (35)**	**Bulgaria (21)**
4	**Bulgaria (39)**	Mauritius (44)	**Hungary (37)**	Turkey (23)
5	**Montenegro (41)**	Bosnia and Herzegovina (47)	**Montenegro (40)**	**Montenegro (29)**
6	Mauritius (49)	**Bulgaria (49)**	Costa Rica (45)	Costa Rica (32)
7	Costa Rica (51)	**Montenegro (50)**	Turkey (46)	**Hungary (35)**
8	Belarus (53)	Colombia (51)	Thailand (50)	Panama (36)
9	Romania (54)	South Africa (54)	Romania (52)	Thailand (43)
10	Thailand (55)	Belarus (55)	Panama (53)	Argentina (52)
Lower-middle-income economies (34 in total)				
1	**Moldova, Republic of (44)**	**Mongolia (53)**	**Moldova, Republic of (31)**	**Moldova, Republic of (5)**
2	**Viet Nam (52)**	Georgia (67)	**Viet Nam (39)**	**Viet Nam (9)**
3	**Armenia (61)**	**Armenia (69)**	**Ukraine (47)**	Côte d'Ivoire (10)
4	**Ukraine (64)**	**Moldova, Republic of (74)**	**Armenia (51)**	**Ukraine (15)**
5	**Mongolia (66)**	Morocco (76)	India (69)	Cameroon (19)
6	Georgia (73)	**Viet Nam (78)**	Senegal (72)	Senegal (24)
7	Morocco (78)	Bhutan (82)	**Mongolia (73)**	Nigeria (28)
8	India (81)	**Ukraine (84)**	Philippines (77)	India (31)
9	Philippines (83)	Guyana (90)	Sri Lanka (79)	**Armenia (34)**
10	Senegal (84)	Cabo Verde (92)	Paraguay (83)	Indonesia (42)
Low-income economies (21 in total)				
1	**Cambodia (91)**	Rwanda (66)	**Kenya (78)**	Mali (14)
2	**Kenya (92)**	**Mozambique (93)**	Mali (81)	**Kenya (30)**
3	Rwanda (94)	**Cambodia (96)**	**Malawi (89)**	Tanzania, United Republic of (38)
4	**Mozambique (95)**	Uganda (102)	**Cambodia (91)**	**Gambia (39)**
5	**Malawi (98)**	**Burkina Faso (109)**	**Gambia (94)**	**Malawi (53)**
6	**Burkina Faso (102)**	**Malawi (111)**	Tanzania, United Republic of (95)	Ethiopia (66)
7	Mali (105)	**Kenya (113)**	**Mozambique (97)**	Myanmar (75)
8	Uganda (111)	**Tajikistan (115)**	**Burkina Faso (100)**	Zimbabwe (77)
9	**Gambia (112)**	Niger (117)	**Tajikistan (106)**	**Cambodia (80)**
10	**Tajikistan (114)**	**Gambia (121)**	Ethiopia (111)	**Burkina Faso (85)**

Note: Economies with top 10 positions in the GII, the Input Sub-Index, and the Output Sub-Index within their income group are highlighted in bold.

only economy also in the high-income top 10 in the efficiency ratio.

Among the upper-middle-income 10 best performers, five remain from 2014: China (29th), Malaysia (32nd), Hungary (35th), Bulgaria (39th), and Mauritius (49th); Thailand (55th) enters this list again this year. Newcomers to this group of 10 best performers are Montenegro (41st), Costa Rica (51st), Belarus (53rd), and Romania (54th), which displace Turkey (58th), South Africa (60th), Panama (62nd), and Seychelles (65th).

China, Malaysia, Hungary, Bulgaria, and Montenegro are among the 10 best performers in the three indices; of these, all except Malaysia also make it to the upper-middle-income top 10 in the efficiency ratio.

The same analysis for lower-middle-income countries shows that eight of the top 10 countries from 2014 remain in the top 10 this year, which include the Republic of Moldova (44th), Viet Nam (52nd), Armenia (61st), Ukraine (64th), Mongolia (66th), Georgia (73rd), Morocco (78th), India (81st); new this year are the Philippines (83rd) and Senegal (84th). The Republic of Moldova, Viet Nam, Ukraine, Armenia, and Mongolia are among the top 10 in the three indices; all of these except Mongolia are the only countries from this income group with top 10 positions in the efficiency ratio as well.

There has also been a strong consistency among low-income countries, with nine out of 10 economies remaining in the top 10. Cambodia paves its way to 1st place in this income group (91st),[32] followed by Kenya (92nd), Rwanda (94th), Mozambique (95th), Malawi (98th), Burkina Faso (102nd), Mali (105th), Uganda (111st), and Gambia (112nd), while Tajikistan (114th) displaces Kyrgyzstan (109th).

Performing strongly across all aspects of the GII, Cambodia, Kenya, Mozambique, Malawi, Burkina Faso, Gambia, and Tajikistan are among the top 10 in all three indices; of these except Malaysia and Tajikistan are in the low-income top 10 on efficiency.

The effectiveness of innovation systems and policies: The Innovation Efficiency Ratio

The Innovation Efficiency Ratio is calculated as the ratio of the Output Sub-Index score over the Input Sub-Index score. It is designed to assess the effectiveness of innovation systems and policies. The 10 countries with the highest Innovation Efficiency Ratios are countries that combine certain levels of innovation inputs with more robust output results (see Table 1): Angola (120th), Switzerland (1st), Luxembourg (9th), Iceland (13th), the Republic of Moldova (44th), China (29th), Malta (26th), the Netherlands (4th), Viet Nam (52nd), and Côte d'Ivoire (116th). Countries in this list such as Angola and Côte d'Ivoire do not show significant innovation input and output results, yet their efficiency ratios appear high because their outputs outweigh their inputs on a low level. Indeed, economies might reach a relatively high efficiency ratio as a result of particularly low input scores. Because of this, efficiency ratios must be analysed jointly with GII, Input, and Output scores, and with the development stages of the economies in mind.

Five of the top 10 most efficient economies are high-income economies: Switzerland, Luxembourg, Iceland, Malta, and the Netherlands. Countries from Sub-Saharan Africa, Europe, South East Asia and Oceania, and Northern Africa and Western Asia take up the first 20 positions in this ratio.

Among upper-middle-income countries, Angola—with the proviso noted above—and China are in the top 10. China makes it to the top 25 globally in outputs, surmounting lower capabilities. In this income group, 50% of countries have better rankings in outputs than they do in inputs.

Among lower-middle-income countries, the Republic of Moldova, Viet Nam, and Côte d'Ivoire are among the global top 10. The Republic of Moldova and Viet Nam are in the global top 50 in outputs, with lower positions in inputs. Within this income group, 61.8% of countries have better rankings in outputs than in inputs. No low-income countries are in the top 10 innovation efficiency rankings.

Leaders and achievers: Leveraging strengths and addressing weaknesses

Figure 3 on pages 28–29 illustrates the above findings by presenting the GII scores plotted against GDP per capita in PPP$ (in natural logs). When countries' stages of development are considered, the GII results can be interpreted in a new light (refer to Box 2 in Chapter 2).

The economies that appear close to the trend line show results that are in accordance with what is expected from their level of development.[33] A majority of economies are in this category. The farther up and above the trend line a country appears, the better its innovation performance is when compared with that of its peers at the same stage of development. Light-coloured bubbles in the figure correspond to the efficient innovators (a majority of them are situated above the trend line), while the dark-coloured bubbles represent those countries in the lower half of the Innovation Efficiency Ratio.

- Among the innovation leaders we find the top 25 countries already discussed above: They are the same economies as in 2014, with the exception of the Czech Republic (new this year) and the removal of Malta—all with GII scores above 50. They have succeeded in creating well-linked innovation systems where investments in human capital thrive in fertile and stable innovation infrastructures to create impressive levels of innovation outputs.
- Economies that perform at least 10 percent higher than their peers for their level of GDP are called 'innovation achievers'. These economies are shown in Table 5.
- Innovation achievers demonstrate rising levels of innovation results because they have made improvements to their institutional frameworks and they have a skilled labour force with expanded tertiary education, better innovation infrastructures, a deeper integration with global credit investment and trade markets, and a sophisticated business community—even if progress on these dimensions is not uniform across their economies.
- There is also a group of economies that perform at least 10 percent below their peers for their level of GDP. This group of economies includes 34 countries: 7 from the high-income group (6 of these are from the Middle East), 14 from the upper-middle-income group, 7 from the lower-middle, and 5 low-income.

Latin America and the Caribbean: Untapped innovation potential

When reviewing the performance of regions at the pillar level it becomes evident that each has its own strengths. Latin America and the Caribbean is an example where these strengths are latent, yet innovation has still not reached desired levels. In this region, Brazil, Argentina, and Mexico—three of the world largest economies based on their GDPs—stand out as economies performing above the region's GII average. Yet none have been signalled as innovation achievers, while smaller nations such as Costa Rica and Guyana have reached this category in the past (see Box 4).

Although it has been noted that the region is converging towards higher scores in Infrastructure and Market sophistication, largely as a result of consistent policies to invigorate these areas, its aggregate performance has remained stable. However, economies such as Chile, Colombia, and Costa Rica, as well as Mexico and Peru, perform increasingly well (refer to Box 4 on pages 33–34 for more details).

Regional rankings

This section discusses regional and sub-regional trends, with snapshots for some of the economies leading in the rankings.

Table 6 on page 30 presents a heatmap with the scores for the top 10, along with average scores by income and regional group. To put the discussion of rankings further into perspective, Figure 4 on page 31 presents, for each region, bars representing the median pillar scores (second quartile) as well as the range of scores determined by the first and second quartile; regions are presented in decreasing order of their average GII rankings (except for the EU, which is placed at the end).

Table 5: Innovation achievers and their income groups and regions

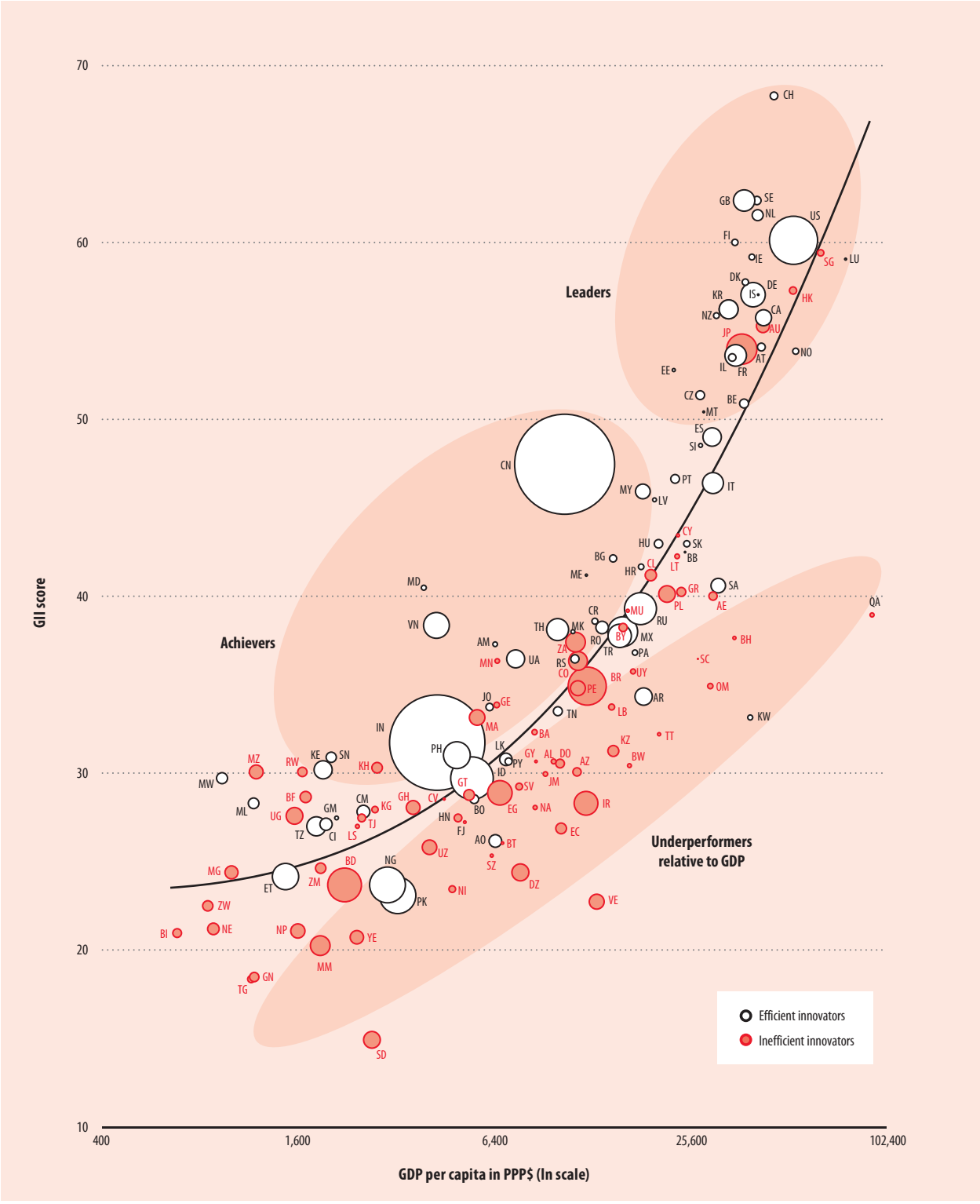
Economy	Income group	Region
Latvia	High-income	EUR
Malta	High-income	EUR
China	Upper-middle	SEAO
Malaysia	Upper-middle	SEAO
Montenegro	Upper-middle	EUR
Bulgaria	Upper-middle	EUR
Thailand	Upper-middle	SEAO
Jordan	Upper-middle	NAWA
Moldova, Rep.	Lower-middle	EUR
Viet Nam	Lower-middle	SEAO
Armenia	Lower-middle	NAWA
Senegal	Lower-middle	SSF
Mongolia	Lower-middle	SEAO
Ukraine	Lower-middle	EUR
India	Lower-middle	CSA
Morocco	Lower-middle	NAWA
Malawi	Low-income	SSF
Mozambique	Low-income	SSF
Rwanda	Low-income	SSF
Kenya	Low-income	SSF
Mali	Low-income	SSF
Burkina Faso	Low-income	SSF
Cambodia	Low-income	SEAO
Uganda	Low-income	SSF

Note: These countries appear 10% or more above the trend line and are listed here in order of distance.
Regions are based on the United Nations Classification: EUR = Europe; NAC = Northern America; LCN = Latin America and the Caribbean; CSA = Central and Southern Asia; SEAO = South East Asia and Oceania; NAWA = Northern Africa and Western Asia; SSF = Sub-Saharan Africa.

Sub-Saharan Africa (32 countries)

In recent years, three Sub-Saharan African countries have reached positions in the upper half of the GII rankings: Mauritius has been in the top half since 2011 and is 49th in 2015 (although down from 40th in 2014); South Africa, which has been in the top half of the rankings in all previous editions of the GII, is 60th in 2015 (down from 53rd in 2014); and Seychelles, which was in the top half of the rankings (51st) in 2014, is down to 65th in 2015. In addition,

Figure 3: GII scores and GDP per capita in PPP$ (bubbles sized by population)



Note: 'Efficient innovators' are countries/economies with Innovation Efficiency ratios ≥ 0.71; 'Inefficient innovators' have ratios < 0.71; the trend line is a polynomial of degree three with intercept ($R^2 = 0.739$).

Figure 3: GII scores and GDP per capita in PPP$ (bubbles sized by population): ISO-2 Country Codes

Code	Country
AE	United Arab Emirates
AL	Albania
AM	Armenia
AO	Angola
AR	Argentina
AT	Austria
AU	Australia
AZ	Azerbaijan
BA	Bosnia and Herzegovina
BB	Barbados
BD	Bangladesh
BE	Belgium
BF	Burkina Faso
BG	Bulgaria
BH	Bahrain
BI	Burundi
BO	Bolivia, Plurinational St.
BR	Brazil
BT	Bhutan
BW	Botswana
BY	Belarus
CA	Canada
CH	Switzerland
CI	Côte d'Ivoire
CL	Chile
CM	Cameroon
CN	China
CO	Colombia
CR	Costa Rica
CV	Cabo Verde
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
DO	Dominican Republic
DZ	Algeria
EC	Ecuador
EE	Estonia
EG	Egypt
ES	Spain
ET	Ethiopia
FI	Finland
FJ	Fiji
FR	France
GB	United Kingdom
GE	Georgia
GH	Ghana

Code	Country
GM	Gambia
GN	Guinea
GR	Greece
GT	Guatemala
GY	Guyana
HK	Hong Kong (China)
HN	Honduras
HR	Croatia
HU	Hungary
ID	Indonesia
IE	Ireland
IL	Israel
IN	India
IR	Iran, Islamic Rep.
IS	Iceland
IT	Italy
JM	Jamaica
JO	Jordan
JP	Japan
KE	Kenya
KG	Kyrgyzstan
KH	Cambodia
KR	Korea, Rep.
KW	Kuwait
KZ	Kazakhstan
LB	Lebanon
LK	Sri Lanka
LS	Lesotho
LT	Lithuania
LU	Luxembourg
LV	Latvia
MA	Morocco
MD	Moldova, Rep.
ME	Montenegro
MG	Madagascar
MK	TFYR of Macedonia
ML	Mali
MM	Myanmar
MN	Mongolia
MT	Malta
MU	Mauritius
MW	Malawi
MX	Mexico
MY	Malaysia
MZ	Mozambique
NA	Namibia
NE	Niger

Code	Country
NG	Nigeria
NI	Nicaragua
NL	Netherlands
NO	Norway
NP	Nepal
NZ	New Zealand
OM	Oman
PA	Panama
PE	Peru
PH	Philippines
PK	Pakistan
PL	Poland
PT	Portugal
PY	Paraguay
QA	Qatar
RO	Romania
RS	Serbia
RU	Russian Federation
RW	Rwanda
SA	Saudi Arabia
SC	Seychelles
SD	Sudan
SE	Sweden
SG	Singapore
SI	Slovenia
SK	Slovakia
SN	Senegal
SV	El Salvador
SZ	Swaziland
TG	Togo
TH	Thailand
TJ	Tajikistan
TN	Tunisia
TR	Turkey
TT	Trinidad and Tobago
TZ	Tanzania, United Rep.
UA	Ukraine
UG	Uganda
US	United States of America
UY	Uruguay
UZ	Uzbekistan
VE	Venezuela, Bolivarian Rep.
VN	Viet Nam
YE	Yemen
ZA	South Africa
ZM	Zambia
ZW	Zimbabwe

Table 6: Heatmap for GII top 10 economies and regional and income group averages (1–100)

Country/Economy	GII	Institutions	Human capital and research	Infrastructure	Market sophistication	Business sophistication	Input	Knowledge and technology outputs	Creative outputs	Output	Efficiency
Switzerland	68.29	89.62	59.22	58.63	72.33	59.97	67.95	72.41	64.84	68.63	1.01
United Kingdom	62.42	87.32	57.45	63.04	74.31	53.59	67.14	54.92	60.48	57.70	0.86
Sweden	62.39	90.00	61.67	62.75	63.70	56.92	67.01	60.45	55.10	57.77	0.86
Netherlands	61.58	91.88	51.72	60.50	61.77	55.26	64.23	55.93	61.92	58.93	0.92
United States of America	60.10	86.81	54.03	58.84	81.48	55.35	67.30	57.96	47.81	52.89	0.79
Finland	59.97	95.84	64.89	58.51	61.51	58.75	67.90	51.89	52.18	52.03	0.77
Singapore	59.35	95.44	60.89	69.54	71.57	63.13	72.11	51.47	41.71	46.59	0.65
Ireland	59.13	87.22	50.05	54.86	63.96	58.36	62.89	55.70	55.02	55.36	0.88
Luxembourg	59.01	83.54	40.84	54.23	56.23	60.24	59.02	49.06	68.96	59.01	1.00
Denmark	57.70	93.13	62.43	55.71	68.35	49.71	65.87	46.06	52.99	49.53	0.75
Average	**37.01**	**62.10**	**31.15**	**39.25**	**48.55**	**35.66**	**43.35**	**28.23**	**33.10**	**30.67**	**0.69**
Region											
Northern America	57.91	49.65	89.73	51.50	59.87	77.48	66.18	49.94	49.36	49.65	0.75
Europe	47.99	76.37	44.15	49.61	54.95	42.29	53.48	39.44	45.56	42.50	0.79
South East Asia and Oceania	42.68	65.87	38.43	46.25	56.16	41.70	49.68	35.53	35.84	35.69	0.72
Northern Africa and Western Asia	35.26	61.05	32.08	41.74	46.24	30.44	42.31	24.83	31.59	28.21	0.67
Latin America and the Caribbean	32.49	54.87	25.29	35.37	44.29	35.37	39.04	21.01	30.86	25.94	0.66
Sub-Saharan Africa	27.05	51.66	16.89	25.60	41.37	30.29	33.16	19.34	22.53	20.94	0.64
Central and Southern Asia	27.03	47.67	22.41	31.77	43.00	25.60	34.09	20.12	19.82	19.97	0.59
Income level											
High income	49.63	79.98	46.35	53.51	56.81	44.27	56.18	39.64	46.50	43.07	0.76
Upper-middle income	34.58	58.90	29.85	38.75	46.17	33.31	41.40	25.10	30.44	27.77	0.67
Lower-middle income	29.10	49.90	20.60	30.04	43.53	29.34	34.68	21.41	25.61	23.51	0.68
Low income	25.35	46.76	15.88	22.49	42.14	30.48	31.55	18.86	19.43	19.14	0.61

Worst — Average — Best

Note: Darker shadings indicate better performances. Countries/economies are classified according to the World Bank Income Group and the United Nations Regional Classifications (July 2012 and 11 February 2013, respectively)

six other countries from this region are ranked among the top 100: Senegal (84th), Botswana (90th), Kenya (92nd), Rwanda (94th), Mozambique (95th), and Malawi (98th). However, with 31 missing values, Seychelles ranks 1st in the list of economies with the highest number of missing values (see Annex 2). If one removes Seychelles from the top list for this reason, the top regional performers are Mauritius, South Africa, and Senegal.

The remaining 23 countries in this region can be found at the bottom of the rankings (100 or lower); 10 of them have improved since 2014. Malawi, Mozambique, Senegal, Rwanda, Kenya, Mali, Burkina Faso, and Uganda—also an innovation outperformer—are among the innovation achievers this year, while Burundi, Niger, Namibia, Angola, Swaziland, Guinea, Togo, Seychelles, Botswana, and Sudan have below-par performances.

Countries from this region with the biggest improvement in GII rankings are Malawi and Angola (improving 15 places each), Senegal and Mali (14 each), Mozambique (12), Rwanda (8), Burkina Faso (7), and the United Republic of Tanzania (6).

Figure 4: Median scores by regional group and by pillar

Note: The bars show median scores (second quartiles); the lines show the range of scores between the first and third quartiles.

Nearly 50% of the countries with the highest number of missing values (20 or more) are from this region (see Annex 2). Because the GII does not impute values for missing data, including missing values can have a positive impact on some economies' overall rankings. If only those countries with data coverage of 75% or higher were assessed, Seychelles would lose its 2nd place ranking (it ties for the highest number of missing values), as would Rwanda (95th, data coverage of 72%) and Malawi (98th, data coverage of 71%), which now rank 7th and 9th in the region, respectively. This would make Senegal number 3 in the region, and bring in Namibia as 8th, Ghana as 9th, and Uganda as 10th. Conversely, two countries from this region should be commended for having over 90% data coverage: South Africa and Kenya.

Central and Southern Asia (11 economies)

In all prior editions of the GII, of the countries in Central and Southern Asia, only India (81st) and Kazakhstan (82nd) have consistently achieved positions among the first 100; this year, Bhutan (121st) drops out of the top 100 and is displaced by Sri Lanka (85th). The remaining seven countries of the region are found at the bottom of the rankings: the Islamic Republic of Iran (106th), Kyrgyzstan (109th), Tajikistan (114th), Uzbekistan (122nd), Bangladesh (129th), Pakistan (131st), and Nepal (135th). In 2015 only India remains an innovation achiever, with Nepal and Bhutan joining Tajikistan, Uzbekistan, Pakistan, Kazakhstan, and the Islamic Republic of Iran with below-par performances relative to their GDP (Figure 3). All of these countries, with the exception of Pakistan and Kazakhstan, are highlighted as being among those economies with the highest number of missing values (see Annex 2).

India still comes 1st in the region, although it is now 8th among lower-middle-income countries (7th in 2014) and has dropped five positions in the overall GII since 2014. With more than 1.2 billion inhabitants and a robust economy, this lower-middle-income country is again among the innovation achievers and has also been highlighted as an innovation outperformer (see Chapters 2 and 8). Its new government is dedicated to focusing on further improving the economy, business investment, and innovation. India's strengths lie in the sub-pillars Knowledge diffusion (34th), R&D (44th), General infrastructure (43rd), and Investment (42nd). India has made some progress in Institutions (improving two places) and Knowledge and technology outputs (improving one place to reach 49th). Still, its position remains weaker in Institutions (104th) and Infrastructure (87th), with rankings deteriorating in Human capital and research (103rd), Market sophistication (72nd), Business sophistication (116th), and Creative outputs (95th) (falling from 96th, 50th, 93rd, and 82nd in 2014, respectively).

Sri Lanka makes commendable progress in its GII ranking from 105th in 2014 to 85th this year. With the exception of Creative outputs, Sri Lanka advances significantly in all GII pillars. Although some of this development can be linked to methodological changes (see Annex 2) and other countries worsening (particularly in Human capital and research), Sri Lanka makes advancements at the raw data level in areas such as the government's online service index and online e-participation,[34] GDP per unit of energy use, and communications and computer and information services imports. Conversely, Sri Lanka worsened at the raw data level in areas such as ease of starting a business, ease of resolving insolvency, rule of law, employment in knowledge-intensive services, and new business density.

Latin America and the Caribbean (22 economies)

Latin America and the Caribbean includes only upper- and lower-middle-income economies except for high-income Barbados, Trinidad and Tobago, Chile, and Uruguay (see also Box 4 for details about this region).

This year Barbados (37th) reaches 1st place in the regional rankings,[35] followed by Chile (42nd) and upper-middle-income countries Costa Rica (51st), Mexico (57th), Panama (62nd), Colombia (67th), Uruguay (68th), and Brazil (70th)—all in the first half of the rankings. However, with 26 missing values, Barbados is among the economies with the highest number of missing values (see Annex 2). If Barbados is eliminated from the top list for this reason, the top regional performers are Chile, Costa Rica, and Mexico.

The remaining countries in the top 100 are Peru (71st), Argentina (72nd), Trinidad and Tobago (80th), Guyana (86th), Paraguay (88th), Dominican Republic (89th), Jamaica (96th), and El Salvador (99th). The remaining countries are ranked below 100: Guatemala (101st), the Plurinational State of Bolivia (104th), Honduras (113th), Ecuador (119th), Nicaragua (130th), and the Bolivarian Republic of Venezuela (132nd).

No countries in the region are among innovation achievers this year; seven display below-par performances relative to their GDP per capita (Figure 3): Jamaica and Dominican Republic (both drop from performing at par to

Box 4: Latin America and the Caribbean: A region with improving but largely untapped innovation potential

This year the Global Innovation Index (GII) identifies a small set of emerging economies that exhibit remarkable innovation performance over time. Innovation performance is reviewed by assessing a country's GII score and its performance in each of the seven innovation input and output factors relative to its level of development (see Chapter 2).

In this analysis, no economies from Latin America qualify as innovation outperformers.[1]

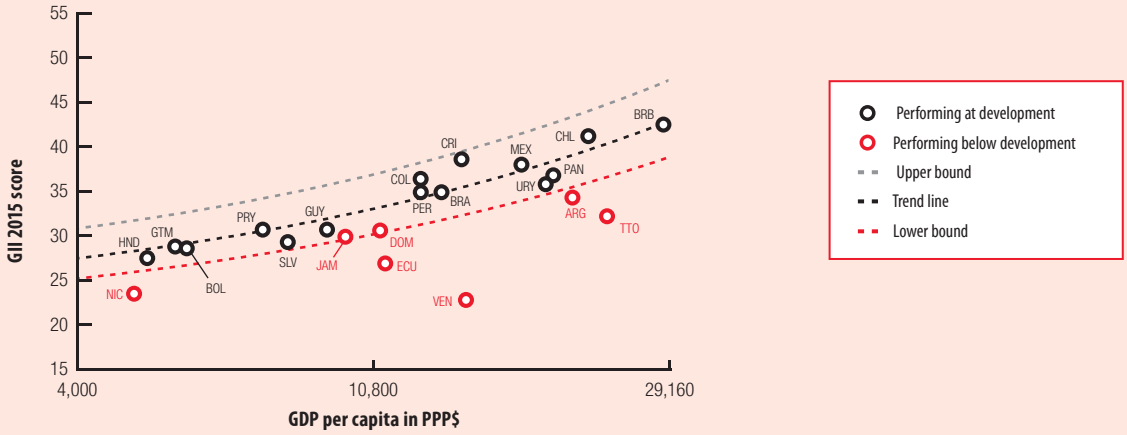
However, between 2011 and 2014, only Costa Rica (2013) and Guyana (2011) were once reported as outperforming on innovation relative to their development level.[2] The fact that Chile is a high-income economy—and thus is now competing with world leaders—makes it harder for it to outperform relative to its development level.

Figure 4.1 and the data for 2015 show that only Chile, Colombia, and Costa Rica detach themselves from their expected performance and move in the direction of outperforming relative to their GDP per capita.[3] Mexico and Peru are next in line, and they also do well on various innovation inputs and outputs in 2015.

This tendency of the relatively strong performance exhibited by the countries noted above is also mirrored by the regional comparison. Since 2011—in addition to Argentina, Brazil, and Uruguay—Chile, Colombia, and Costa Rica have consistently performed above the region's average GII, both overall as well as on input and output metrics. Mexico and Peru excel primarily in the area of innovation inputs.

When it comes to outperformance at the pillar level, six Latin-American economies scored above their income group average in four or more pillars almost every year since 2011: Brazil and Costa Rica (every year) and Argentina, El Salvador, Panama, and Peru (every year except one) (see Table 4.1). Nine countries have done so in 2015. Colombia and Costa Rica both outperform in five or more pillars in 2015. At the regional level both these economies also outperform in most pillars, with the exception of Market sophistication for Colombia and Creative outputs for Costa Rica. Chile is far from outperforming its high-income peers in four or more pillars, yet its notable performance is shown by above-average regional scores in all seven pillars. Mexico stands out in 2015 because it is the only country in the region to score above the upper-middle-income averages in all seven pillars this year.

Figure 4.1: Latin America and the Caribbean economies closest to the innovation achievers' threshold, 2015



Note: ARG = Argentina; BOL = Bolivia, Plurinational State of; BRB = Barbados; BRA = Brazil; CHL = Chile; COL = Colombia; CRI = Costa Rica; DOM = Dominican Republic; ECU = Ecuador; GTM = Guatemala; GUY = Guyana; HND = Honduras; JAM = Jamaica; MEX = Mexico; NIC = Nicaragua; PAN = Panama; PER = Peru; PRY = Paraguay; SLV = El Salvador; TTO = Trinidad and Tobago; URY = Uruguay; and VEN = Venezuela, Bolivarian Republic.

(Continued on next page)

performing below-par), Nicaragua, Argentina, Ecuador, Trinidad and Tobago, and the Bolivarian Republic of Venezuela. Honduras, El Salvador, and Uruguay, all improved since 2014, move out of this underperformer group.

Barbados is ranked 37th, up four positions from 41st place in 2014. With a population of 0.3 million and a GDP per capita of PPP$25,193, Barbados ranks 46th in the Input Sub-Index (down from 38th in 2014). It comes in at 36th in the Output Sub-Index (up from 53rd), where its significant improvement is determined by better rankings in

Box 4: Latin America and the Caribbean: A region with improving but largely untapped innovation potential *(cont'd.)*

Table 4.1: Latin America and the Caribbean: Innovation achievers and pillar outperformers, 2011–15

Economy	Income group	Years as an innovation achiever (total)	Years as a pillar outperformer (total)
Argentina	Upper-middle income		2014, 2013, 2012, 2011 (4)
Bolivia, Plurinational St.	Lower-middle income		2015, 2013 (2)
Brazil	Upper-middle income		2015, 2014, 2013, 2012, 2011 (5)
Colombia	Upper-middle income		2015, 2013 (2)
Costa Rica	Upper-middle income	2013 (1)	2015, 2014, 2013, 2012, 2011 (5)
El Salvador	Lower-middle income		2015, 2014, 2013, 2012 (4)
Guatemala	Lower-middle income		2012 (1)
Guyana	Lower-middle income	2011 (1)	2013, 2012, 2011 (3)
Honduras	Lower-middle income		2013 (1)
Panama	Upper-middle income		2015, 2014, 2012, 2011 (4)
Mexico	Upper-middle income		2015, 2014, 2013 (3)
Nicaragua	Lower-middle income		2013, 2012 (2)
Paraguay	Lower-middle income		2015, 2014, 2012 (3)
Peru	Upper-middle income		2015, 2014, 2013, 2012 (4)

Notes

1 For a country to be labeled as an 'innovation outperformer' it has to be identified as an 'innovation achiever' and it must also score above its income group average in four or more GII pillars for two or more years, including the two most recent—2013 and 2014. In 2015 11 economies were identified as innovation outperformers this was 2013 and 2014. Northern America is the only other region that has no representation among this group of 11 innovation outperformers. This is because the countries that comprise this region are among the top 25 innovation leaders and hence not eligible for innovation outperformer status. See Chapter 2 for more details.

2 Guyana is missing 33% of the data points for its analysis (27 out of 80 indicators have no data available).

3 The general trendline is defined by the scores and economic development level of all countries considered in the GII. The threshold bounds are defined as 10% above and 10% below the scores defined by trendline (see Box 2 in Chapter 2 for more details).

the pillars of Knowledge and technology outputs (18th up from 33rd) and Creative outputs (63rd up from 85th).

Brazil is ranked 70th (down from 61st in 2014), 19th among upper-middle-income countries (down from 16th), and 8th in the region (down from 5th). Although Brazil drops in its overall GII ranking, it improves in a number of innovation inputs. The country improves in six of the eight variables in Institutions, bringing up this pillar ranking by 11 places to reach 85th. In addition, it improves in Market sophistication by two places to 87th, a result of bettering eight of this pillar's nine variables. Conversely, Brazil's major falls take place in both innovation output pillars, where it drops from 65th to 72nd in Knowledge and technology outputs and from 64th to 82nd in Creative outputs. Although its fall in Knowledge diffusion is mainly the result of other countries improving in this area, it is declining in ICTs and business and organizational model creation, and in online creativity, as measured by the GII.

Northern Africa and Western Asia (19 economies)

Israel (22nd) and Cyprus (34th) achieve the top positions in the region for the third year running. Three of the six countries of the Gulf Cooperation Council (GCC) come next: Saudi Arabia (43rd), the United Arab Emirates (47th), and Qatar (50th).

Although the scaling by GDP of a few indicators (required for comparability across countries) penalizes the relatively wealthy, resource-rich countries of the GCC, they often exhibit relative shortcomings in important areas in which this effect does not prevail, such as Institutions, Market sophistication, and Business sophistication. This phenomenon—reminiscent of what has been called the 'resource curse' or the 'paradox of plenty'—has been discussed in the GII before (see the 2013 and 2014 reports). These GCC countries, however, are uniquely positioned to do better in the years to come. Many of them have been diversifying towards innovation-rich sectors already.

Furthermore, the revisions to the PPP conversion factors implemented by the World Bank's International Comparison Program (ICP) (refer to Annex 2), a scaling factor used for 11 of the 79 GII variables, had a particularly significant impact on nine economies in this region, especially the United Arab Emirates, Jordan, Kuwait, Bahrain, Saudi Arabia, and Oman. Although the revised PPP values did not greatly affect the overall GII rankings in the region,

they did affect some of the variable-level rankings.

Most of the countries in this region rank in the top 100, including Turkey (58th), Bahrain (59th), Armenia (61st), Oman (69th), Georgia (73rd), Lebanon (74th), Jordan (75th), Tunisia (76th), Kuwait (77th), Morocco (78th), Azerbaijan (93rd), and Egypt (100th). Only two fall out of the top 100—Algeria (126th) and Yemen (137th).

Although Israel is the only innovation leader in the region, Armenia and Jordan remain in the group of innovation achievers (both are also flagged as innovation outperformers; see Chapter 2) and are joined by Morocco this year, while Georgia just falls out of this group. Morocco has made a notable improvement of eight places—another example of a country putting in effort to improve its innovation metrics. Improving at the raw data level in expenditure on education and government expenditure on secondary education per pupil are the main reasons for Morocco's progress in Human capital and research, where it advances from 64th to 56th. Conversely, its improvement in Infrastructure is linked to methodological changes to the UN e-Government Survey methodology questionnaire (variables 3.1.3 and 3.1.4).

Lebanon, Azerbaijan, Saudi Arabia, the United Arab Emirates, Yemen, Algeria, Bahrain, Oman, Kuwait, and Qatar show below-par performances compared to their income levels (Figure 3).

Israel falls seven places from 15th in 2014 to 22nd in 2015, yet still remains number 1 in the region. With an innovation input rank of 22 and an output rank of 16, it has improved its overall efficiency ratio ranking from 42nd to 20th. Israel's biggest drops are in Human capital and research (5th in 2014 to 11th in 2015), Market sophistication (12th in 2014 to 21st in 2015), and Business sophistication (3rd in 2014 to 11th in 2015). Since last year Israel has considerably improved its data availability. But while helping to provide a more accurate picture of its innovation ranking, the inclusion of these new data is partially responsible for Israel's fall in Human capital and research and its overall ranking (see Annex 2). Israel also makes some notable improvements at the variable level, particularly in applied tariff rates, communications, computer and information services imports, and cultural and creative services exports.

South East Asia and Oceania (16 economies)

This region's 16 economies range across all income groups. The first five rank among the top 25 in the three indices (GII, inputs, and outputs): Singapore (7th), which displaces Hong Kong (China) at the top of the regional rankings this year; Hong Kong (China), which is now 11th globally; the Republic of Korea (14th); New Zealand (15th); and Australia (17th). These five economies, as well as Japan (19th), are innovation leaders, all placing within the top 25.

Among upper-middle-income economies, China (29th) and Malaysia (32nd) rank high, with Thailand falling back down the ranks from 48th in 2014 to 55th in 2015 and Fiji performing poorly at 115th. Lower-middle-income Viet Nam keeps its innovation achiever status—and is flagged as an innovation outperformer—while advancing 19 places to 52nd. Mongolia drops to 66th, the Philippines progresses to 83rd, and Indonesia falls to 97th. Low-income Cambodia now places in the top 100 (up from 106th in 2014 to 91st in 2015) and Myanmar is ranked 138th.

This region has six innovation achievers: China, Viet Nam, Mongolia (also an innovation outperformer), Malaysia, Cambodia (a new addition), and Thailand. With the exception of Northern America, South East Asia and Oceania is the region with the lowest number of economies with below-par innovation performances (only Myanmar;see Figure 3).

For the fourth year in a row **China** maintains its strengths: overall, it preserves its 29th place ranking and is 1st among upper-middle-income countries and 7th in the region. China advances in all areas of the Institutions pillar (ranked 91st) and makes slight improvements in Human capital and research (up one place to 31st), Infrastructure (up seven places to 32nd), Business sophistication (up one place to 31st), and Creative outputs (up five places to 54th). China has also been flagged as an innovation outperformer in this year's edition (see Chapters 2 and 6). Conversely, China dropped slightly in Market sophistication (down five places to 59th) and Knowledge and technology outputs (down one place to 3rd). China is only 3.5 points away from making it into the GII top 25, an improvement over the 3.9 points away it was in 2014.[36]

Malaysia, improving one place to reach 32nd this year, has put considerable effort into improving its innovation performance and coordinating its STI via the Ministry of Science, Technology and Innovation. The result of this effort is also evident in its low level of missing values (only two). It improves in three overall pillars of the GII: Institutions (by eight places to 42nd), Business sophistication (by seven places to 22nd), and Knowledge technology and outputs (by four places to 35th). Conversely, while it dropped only seven places

in Creative outputs, it dropped nine and ten places in Infrastructure and Market sophistication, respectively. Malaysia has also been flagged as an innovation outperformer in this year's edition (see Chapter 2).

Europe (39 countries)

As last year, a total of 16 European countries (13 of them from the EU) are among the top 25: Switzerland (1st), the UK (2nd), Sweden (3rd), the Netherlands (4th), Finland (6th), Ireland (8th), Luxembourg (9th), Denmark (10th), Germany (12th), Iceland (13th), Austria (18th), Norway (20th), France (21st), Estonia (23rd), the Czech Republic (24th), and Belgium (25th). All of these achieve positions in the top 25 in both the Output and Input Sub-Indices with the exception of Estonia (26th in inputs), the Czech Republic (27th in inputs), and Belgium (28th in outputs). It should be noted that most of the countries in this region have the fewest missing values, leading them to display the most accurate GII rankings (see Annex 2).

Sixteen countries follow among the top 50 and maintain relatively stable rankings since 2014, including all remaining EU countries, with the exception of Romania (54th): Malta (26th), Spain (27th), Slovenia (28th), Portugal (30th), Italy (31st), Latvia (33rd), Hungary (35th), Slovakia (36th), Lithuania (38th), Bulgaria (39th), Croatia (40th), Montenegro (41st), the Republic of Moldova (44th), Greece (45th), Poland (46th), and the Russian Federation (48th).

The remaining European economies, with the exception of Ukraine, improve their overall GII rankings from 2014 to 2015: Belarus (53rd, up from 58th in 2014), the Former Yugoslav Republic of Macedonia (56th, up from 60th in 2014), Serbia (63rd, 67th in 2014), Ukraine (64th, 63rd in 2014), Bosnia and Herzegovina (79th, 81st in 2014), and Albania (87th, 94th in 2014). In addition, the Republic of Moldova and Ukraine are positioned among the innovation achievers (the Republic of Moldova is also an innovation outperformer), while Greece and Albania show below-par performances (see Figure 3).

Ranking 48th, up one position from its 49th place in 2014, **the Russian Federation** is ranked 32nd in Europe. This year the country maintains a relatively stable position across innovation inputs (from 56th in 2014 to 52nd in 2015) and outputs (from 45th in 2014 to 49th in 2015). Its biggest improvements lie in the Market and Business sophistication pillars, improving 17 positions to 94th and 16 positions to 44th place, respectively. Within these pillars, the Russian Federation's strengths are employment in knowledge-intensive services, the percentage of females employed with advanced degrees, royalties and license fee payments, national office patent applications, national office utility model applications, citable documents H index, and FDI net outflows. Its biggest fall is in Infrastructure, dropping 14 places to 65th. Its main weakness in this pillar is GDP per unit of energy use.

Conclusions

The theme for this year's GII is 'Effective Innovation Policies for Development'. This chapter has provided a current assessment of global innovation expenditures in the context of a fragile economic recovery. In addition, it has analysed opportunities and challenges when designing innovation policies in a developing country context.

Finally, this chapter has presented the main GII 2015 results, distilling six main messages. The six key messages addressed by this chapter—that quality matters at the top; that emerging economies are catching up to rich economies; that institutions matter (especially because of their role in establishing rules for international interaction); that the Business sophistication pillar makes a particularly big difference among low-income economies; that encouraging signs are emerging in Sub-Saharan Africa; and that the BRICS economies, especially China, are gaining ground in innovation quality—indicate that there is potential for those economies on the cusp of the top 10 or top 25 to make their way into the top rankings, provided they focus their efforts on improving key areas of innovation such as innovation institutions and the quality of innovation.

The remaining chapters provide more details on developing countries that have outperformed on innovation. Chapter 2 identifies a set of low- and middle-income countries that—over time—have succeeded in outperforming on innovation generally and on specific innovation inputs and outputs more specifically. Chapters 3 through 11 then provide additional details on innovation policies adapted in some of these developing countries, assessing their strengths and further development potential.

Notes and References for Box 1

Notes

1 Data are based on the UNESCO-UIS Science & Technology Data Center, updated February 2015. Data used: GERD, performed by business enterprise (in '000 PPP$, constant prices, 2005).

Economies included: Afghanistan, Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia (Plurinational State of), Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cuba, Cyprus, Czech Republic, Côte d'Ivoire, Democratic Republic of the Congo, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong (China), Hungary, Iceland, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Macao (China), Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Mauritania, Mauritius, Mexico, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nepal, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Republic of Korea, the Republic of Moldova, Romania, Russian Federation, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sudan, Suriname, Swaziland, Sweden, Switzerland, Taiwan (China), Tajikistan, Thailand, the Former Yugoslav Republic of Macedonia, Timor-Leste, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, the United Republic of Tanzania, the United States of America, Uruguay, Uzbekistan, Venezuela (Bolivarian Republic of), Viet Nam, Yemen, Zambia, and Zimbabwe.

2 Data are based on the OECD Main Science and Technology Indicators (MSTI), updated 4 February 2015. Data used: Gross domestic expenditure on R&D (GERD) at constant 2005 PPP$. OECD countries are represented by the MSTI indicator 'OECD-total'.

3 UNESCO-UIS Science & Technology Data Center and OECD Main Science and Technology Indicators (MSTI), updated February 2015. Data used: GERD, performed by business enterprise (in '000 PPP$, constant prices, 2005).

Economies included are the same as those listed in endnote 1.

4 OECD MSTI, updated 4 February 2015. Data used: Business enterprise expenditure on R&D (BERD) at constant 2005 PPP$, See Main Science and Technology Indicators (MSTI) indicator 'OECD-total'.

5 Based on the *2014 EU Industrial R&D Investment Scoreboard* from the European Commission (DG Research and Innovation and DG Joint Research Centre). The *2014 Scoreboard* is based on a changing sample of the top 2,500 R&D spenders of a given year. What is measured is the total value of these firms' global R&D expenditures, irrespective of the location where the relevant R&D takes place. The distribution of countries in global top 2,500 R&D spenders shows that firms with headquarters in the United States of America, Japan, and Germany were still the top R&D spenders in 2013. Firms in China have increased their share to 3.8% in 2013, while the share of Japanese firms has decreased to 15.9%.

6 PricewaterhouseCoopers and Strategy&, 2014. This growth is based on a changing sample of firms of the top 1,000 R&D spenders of a given year. It also measures the total value of their global R&D expenditures, irrespective of the location where the relevant R&D takes place.

References

European Commission. 2014. *The 2014 EU Industrial R&D Investment Scoreboard.* Authors Héctor Hernández, Alexander Tübke, Fernando Hervás, Antonio Vezzani, Mafini Dosso, Sara Amoroso, and Nicola Grassano. Seville, Spain: European Commission, Joint Research Centre.

OECD (Organisation for Economic Co-operation and Development). 2014. *OECD Science, Technology and Industry Outlook 2014.* Paris: OECD Publishing.

PricewaterhouseCoopers and Strategy&. 2014. 'Global Innovation 1000: Proven Paths to Innovation Success: Ten Years of Research Reveal the Best R&D Strategies for the Decade Ahead'. *strategy+business magazine* 77 (Winter 2014), 28 October. Available at http://www.strategy-business.com/article/00295?gko=b91bb&tid=27782251&pg=all.

Notes and References for Chapter 1

Notes

1 IMF, 2015a; OECD, 2015.

2 IMF, 2015a.

3 Conference Board, 2015; IMF, 2015b.

4 World Bank, 2015.

5 OECD, 2009; WIPO, 2010; Dutta et al., 2013, 2014.

6 Dutta et al., 2014.

7 Dutta et al., 2014, based on UNESCO Institute for Statistics R&D data and OECD Main Science and Technology Indicators. See also OECD, 2014.

8 The biggest increase in R&D intensity between 2008 and 2013 was achieved by the Republic of Korea, with a jump from 3.12% to 4.15% of GDP. Slovenia exhibited an increase of nearly 1%, expanding from 1.66% in 2008 to 2.65% in 2013, while the Czech Republic, China, and Serbia have increased their R&D Intensity by 0.7%, 0.61%, and 0.59%.

9 WIPO, 2014. Note also that patent applications under WIPO's Patent Cooperation Treaty (PCT) saw a 4.5% increase in 2014; this represents a fall in growth compared with previous years (WIPO, 2015).

10 WIPO, 2011a.

11 It must be noted that even in these experienced innovative nations, deciding and implementing the right innovation policy mix remains a continual challenge because innovation parameters and objectives tend to evolve. See OECD, 2014.

12 The innovation system approach aims to provide a holistic framework to analyse innovation performance (Freeman, 1987; Lundvall, 1992; Edquist, 1997). It starts from the assumption that firms do not conduct innovation in isolation, but instead are part of a larger system made of multiple agents—for example, universities, financial institutions, governments, and so on—that interact with each other. The functioning and outcomes of innovation systems also depend on institutional, organizational, historical, and political framework conditions.

13 OECD, 2010, proposes a conceptual innovation policy framework of this sort.

14 See also OECD, 2014.

15 Technopolis, 2011.

16 Chaminade et al., 2009; Lundvall et al., 2009; Gault et al., 2010. This heterogeneity is well reflected in the 11 countries chosen as developing-country outperformers this year, which range from Armenia and China to Uganda.

17 Kraemer-Mbula and Wamae, 2010; WIPO, 2011b.

18 Maharajh and Kraemer-Mbula, 2010.

19 Mashelkar, 2012.

20 Fu et al., 2014; Kraemer-Mbula and Wunsch-Vincent, forthcoming.

21 Srinivas and Sutz, 2008.

22 China, which relies heavily on the number of patents, is an exception to this finding.

23 The Russian Federation, which is now classified as a high-income economy, is an exception to this finding.

24 Economies are grouped according to the World Bank classification, which divides them according to 2011 gross national income (GNI) per capita, calculated using the World Bank Atlas method. The groups are: low income, US$1,025 or less; lower-middle income, US$1,026 to US$4,035; upper-middle income, US$4,036 to US$12,475; and high income, US$12,476 or more.

25 Since 2012, the regional groups have been based on the United Nations Classification: EUR = Europe; NAC = Northern America; LCN = Latin America and the Caribbean; CSA = Central and Southern Asia; SEAO = South East Asia and Oceania; NAWA = Northern Africa and Western Asia; and SSF = Sub-Saharan Africa.

26 Note the change in UN methodology for indicators 3.1.3 and 3.1.4 (see Annex 2).

27 Note the change in UN methodology for indicators 3.1.3 and 3.1.4 (see Annex 2).

28 Ireland's improvements in these sub-pillars are partly the result of missing data for indicator 7.1.1 (domestic res trademark app./bn PPP$ GDP).

29 Please note the change in UN methodology at the source for indicators 3.1.3 and 3.1.4 (see Annex 2).

30 This variable was introduced into the GII model in 2015.

31 Following the financial crisis, the Icelandic government introduced a number of measures, including capital controls. These measures strongly affected the patterns of FDI net outflows in Iceland, making a significant impact on Iceland's performance in Knowledge and technology outputs.

32 It should be noted that Cambodia has a significantly high number of missing values (23), which may impact its overall GII ranking.

33 The trend line is defined as a polynomial of degree 3 with intercept.

34 Despite some changes in the UN e-Government Survey methodology questionnaire to better reflect new trends, Sri-Lanka makes very good progress in e-government development.

35 This regional ranking, however, should take into account the fact that a significant number of variables are missing for Barbados. If Barbados was disregarded in the rankings due to low data coverage, Chile would be ranked 1st in the region. Conversely, Colombia is one of the best-performing economies in terms of data coverage, with only one missing value. Colombia also improved its overall GII ranking by one place this year.

36 In order to make it into the top 25, typically a country needs a score of 50. However, there have been instances where a country has had a score of over 50, but did not make it into the top 50, because there were already 50 countries above it.

References

Chaminade, C., L. Bengt-Åke, J. Van, and K. J. Joseph. 2009. 'Designing Innovation Policies for Development: Towards a Systematic Experimentation-Based Approach'. In *Handbook of innovation Systems and Developing Countries: Building Domestic Capabilities in a Global Setting,* eds. B-Å. Lundvall, K. J. Joseph, C. Chaminade, and J. Vang. Cheltenham: Edward Elgar Publishing.

Conference Board. 2015. *Productivity Brief 2015: Global Productivity Growth Stuck in the Slow Lane with No Signs of Recovery in Sight,* authors B. van Ark and A. Erumban, May. New York: The Conference Board.

Cornell University, INSEAD, and WIPO. 2014. *The Global Innovation Index 2014: The Human Factor in Innovation,* eds. S. Dutta, B. Lanvin and S. Wunsch-Vincent. Ithaca, Fontainebleau, and Geneva: Cornell, INSEAD, and WIPO.

Dutta, B. D. Benavente, B. Lanvin, and S. Wunsch-Vincent. 2013. 'The Global Innovation Index 2013: Local Dynamics Keep Innovation Strong in the Face of the Crisis'. In *The Global Innovation Index 2013: The Local Dynamics of Innovation,* eds. S. Dutta and B. Lanvin. Ithaca, Fontainebleau, and Geneva: Cornell, INSEAD, and WIPO. 3–67.

Dutta, S., Escalona Reynoso, R, Bernard, A., Lanvin, B., and S. Wunsch-Vincent. 2014. 'The Global Innovation Index 2014: Nurturing New Sources of Growth by Developing the Human Factor in Innovation'. In *The Global Innovation Index 2014: The Human Factor in Innovation,* eds. S. Dutta, B. Lanvin and S. Wunsch-Vincent. Ithaca, Fontainebleau, and Geneva: Cornell, INSEAD, and WIPO. 3–68.

Edquist, C. 1997. 'Systems of Innovation Approaches: Their Emergence and Characteristics'.In *Systems of Innovation: Technologies, Institutions and Organizations,* ed. C. Edquist. London: Pinter.

Freeman, C. 1987. *Technology, Policy, and Economic Performance: Lessons from Japan.* London: Pinter Publishers.

Fu, X., B. Zanello, G. Essegby, J. Hou, and P. Mohnen. 2014. *Innovation in Low Income Countries.* A survey report for The Diffusion of Innovation in Low Income Countries project (DILIC). DFID-ESRC Growth Research Programme, Oxford: University of Oxford.

Gault, F. 2010. 'Innovation and Development'. In *Innovation Strategies for a Global Economy,* ed. F. Gault. Cheltenham: Edward Elgar Publishing. 133–64.

IMF (International Monetary Fund). 2015a. ' Recent Developments and Prospects'. In *World Economic Outlook (WEO): Uneven Growth: Short- and Long-Term Factors.* April 2015. Washington, DC: IMF.

———. 2015b. 'Where Are We Headed? Perspectives on Potential Output'. *World Economic Outlook (WEO): Uneven Growth: Short- and Long-Term Factors.* April 2015. Washington, DC: IMF.

Kraemer-Mbula, E. and W. Wamae. 2010. 'Adapting the Innovation Systems Framework to Sub-Saharan Africa'. In *Innovation and the Development Agenda,* eds. E. Kraemer-Mbula and W. Wamae. Paris: OECD Publishing. 65–90.

Kraemer-Mbula, E. and S. Wunsch-Vincent. Forthcoming. 'The Informal Economy in Developing Nations: Hidden Engine of Innovation?' In *New Economic Insights and Policies.* Cambridge: Cambridge University Press.

Lanvin, B. and P. Evans, eds. 2013. *Global Talent Competitiveness Index 2013.* INSEAD, Adecco, and HCLI. Available at http://global-indices.insead.edu/gtci.

Lundvall, B-Å. 1992. *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning.* London: Pinter Publishers.

Lundvall, B-Å., J. Vang, J. Joseph, and C. Chaminade. 2009. 'Innovation System Research and Developing Countries'. In *Handbook of Innovation Systems and Developing Countries: Building Domestic Capabilities in a Global Setting,* eds. B-Å. Lundvall, K. J. Joseph, C. Chaminade, and J. Vang. Cheltenham: Edward Elgar Publishing.

Maharajh, R. and E. Kraemer-Mbula. 2010. 'Innovation Strategies in Developing Countries'. In *Innovation and the Development Agenda,* eds. E. Kraemer-Mbula and W. Wamae. Paris: OECD Publishing. 133–51.

Mashelkar, R. A. 2012. On 'Building an Inclusive Innovation Ecosystem'. Paper presented at the Innovation for Inclusive Development conference, Cape Town, 21 November 2012. Department of Science and Technology, South Africa and OECD, Cape Town.

OECD (Organisation for Economic Co-operation and Development). 2009. *Policy Responses to the Economic Crisis: Investing in Innovation for Long-Term Growth,* eds. D. Guellec and S. Wunsch-Vincent. Paris: OECD Publishing.

———. 2010. 'The Innovation Policy Mix'. *Science, Technology and Industry Outlook 2010.* Paris: OECD Publishing. Chapter 4.

———. 2014. *Science, Technology and Industry Outlook 2014.* Paris: OECD Publishing.

———. 2015. *Economic Outlook 97,* preliminary version, June 2015. Paris: OECD Publishing.

Srinivas, S. and J. Sutz. 2008. 'Developing Countries and Innovation: Searching for a New Analytical Approach'. *Technology in Society* 30: 129–40.

Technopolis. 2011. *Trends and Challenges in Demand-Side Innovation Policies in Europe: Thematic Report 2011*. Report prepared for the European Commission, 26 October. Brighton: Technopolis.

World Bank. 2015. *Global Economic Prospects 2015: The Global Economy in Transition*. Washington, DC: World Bank Group.

WIPO (World Intellectual Property Organization). 2010. 'The Impact of the Economic Crisis and Recovery on Innovation'. *World Intellectual Property Indicators 2010.* Geneva: WIPO, Economics and Statistics Division.

———.2011a. 'The Changing Nature of Innovation and Intellectual Property'. In *World Intellectual Property Report 2011.* Geneva: WIPO, Economics and Statistics Division. Chapter 1.

———.2011b. 'Harnessing Public Research for Innovation: The Role of Intellectual Property'. In *World Intellectual Property Report 2011.* Geneva: WIPO, Economics and Statistics Division. Chapter 4.

———. 2014. *World Intellectual Property Indicators 2014.* Geneva: WIPO, Economics and Statistics Division.

———. 2015. *Patent Cooperation Treaty Yearly Review*. Geneva: WIPO, Economics and Statistics Division.

The Global Innovation Index (GII) Conceptual Framework

The rationale for the Global Innovation Index

The Global Innovation Index (GII) project was launched by INSEAD in 2007 with the simple goal of determining how to find metrics and approaches that better capture the richness of innovation in society and go beyond such traditional measures of innovation as the number of research articles and the level of research and development (R&D) expenditures.[1]

There were several motivations for setting this goal. First, innovation is important for driving economic progress and competitiveness—both for developed and developing economies. Many governments are putting innovation at the centre of their growth strategies. Second, the definition of innovation has broadened—it is no longer restricted to R&D laboratories and to published scientific papers. Innovation could be and is more general and horizontal in nature, and includes social innovations and business model innovations as well as technical ones. Last but not least, recognizing and celebrating innovation in emerging markets is seen as critical for inspiring people—especially the next generation of entrepreneurs and innovators.

The GII helps to create an environment in which innovation factors are under continual evaluation, and it provides a key tool and a rich database of detailed metrics for refining innovation policies.

The GII is not meant to be the ultimate and definitive ranking of economies with respect to innovation. Measuring innovation outputs and impacts remains difficult; hence great emphasis is placed on measuring the climate and infrastructure for innovation and on assessing related outcomes.

Although the end results take the shape of several rankings, the GII is more concerned with improving the 'journey' to better measure and understand innovation and with identifying targeted policies, good practices, and other levers that foster innovation. The rich metrics can be used—on the level of the index, the sub-indices, or the actual raw data of individual variables—to monitor performance over time and to benchmark developments against countries in the same region or of the same income category.

Drawing on the expertise of the GII's Knowledge Partners and its prominent Advisory Board, the GII model is continually updated to reflect the improved availability of statistics and our understanding of innovation. This year, however, the model has reached a level of maturity that requires only minor updates (refer to Annex 2).

An inclusive perspective on innovation

The GII adopts a broad notion of innovation, originally elaborated in the *Oslo Manual* developed by the European Communities and the Organisation for Economic Co-operation and Development (OECD):[2]

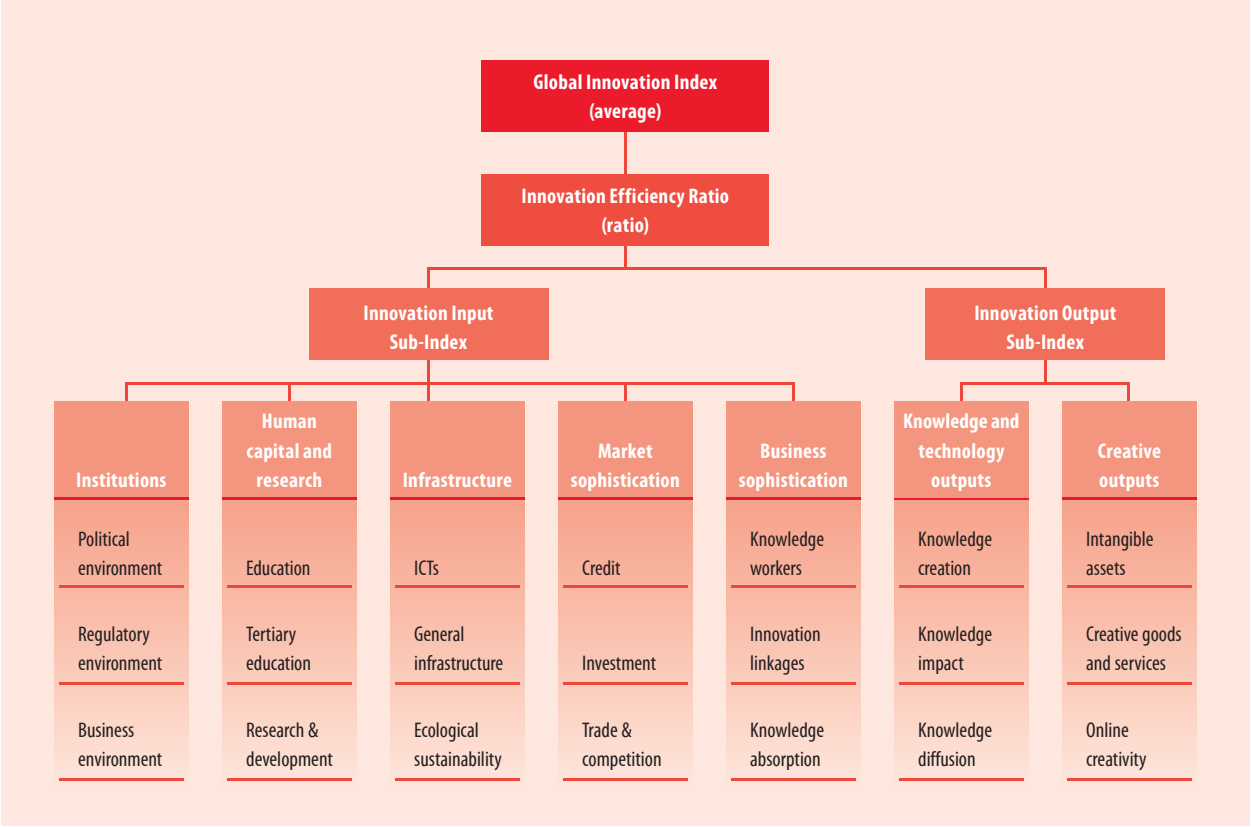
> An innovation is the implementation of a new or significantly improved product (good or service), a new process, a new marketing method, or a new organizational method in business practices, workplace organization, or external relations.

This definition reflects the evolution of the way innovation has been perceived and understood over the last two decades.[3]

Previously economists and policy makers focused on R&D-based technological product innovation, largely produced in-house and mostly in manufacturing industries. This type of innovation was performed by a highly educated labour force in R&D-intensive companies. The process leading to such innovation was conceptualized as closed, internal, and localized. Technological breakthroughs were necessarily 'radical' and took place at the 'global knowledge frontier'. This characterization implied the existence of leading and lagging countries, with low- or middle-income economies only catching up.

Today, innovation capability is seen more as the ability to exploit new technological combinations; it embraces the notion of incremental innovation and 'innovation without research'. Non-R&D innovative expenditure is an important component of reaping the rewards of technological innovation. Interest in

Figure 1: Framework of the Global Innovation Index 2015



understanding how innovation takes place in low- and middle-income countries is increasing, along with an awareness that incremental forms of innovation can impact development. Furthermore, the process of innovation itself has changed significantly. Investment in innovation-related activity has consistently intensified at the firm, country, and global levels, adding both new innovation actors from outside high-income economies and nonprofit actors. The structure of knowledge production activity is more complex and geographically dispersed than ever.

A key challenge is to find metrics that capture innovation as it actually happens in the world today.[4] Direct official measures that quantify innovation outputs remain extremely scarce.[5] For example, there are no official statistics on the amount of innovative activity—defined as the number of new products, processes, or other innovations—for any given innovation actor, let alone for any given country (see Box 1, Annex 1 of Chapter 1 in the GII 2013). Most measures also struggle to appropriately capture the innovation outputs of a wider spectrum of innovation actors, such as the services sector or public entities.

The GII aims to move beyond the mere measurement of such simple innovation metrics. To do so will require the integration of new variables, with a trade-off between the quality of the variable on the one hand and achieving good country coverage on the other hand.

The timeliest possible indicators are used for the GII: 29.8% of data obtained are from 2014, 31.9% are from 2013, 12.5% are from 2012, 4.4% from 2011, and the small remainder (5.6%) are from earlier years.[6]

The GII conceptual framework

The GII is an evolving project that builds on its previous editions while incorporating newly available data and that is inspired by the latest research on the measurement of innovation. This year the GII model includes 141 countries/economies that represent 95.1% of the world's population and 98.6% of the world's GDP (in current US dollars). The GII relies on two sub-indices—the Innovation Input Sub-Index and the Innovation Output Sub-Index—each built around pillars. Four measures are calculated (see Figure 1):

1. **Innovation Input Sub-Index:** Five input pillars capture elements

of the national economy that enable innovative activities.

2. **Innovation Output Sub-Index:** Innovation outputs are the results of innovative activities within the economy. Although the Output Sub-Index includes only two pillars, it has the same weight in calculating the overall GII scores as the Input Sub-Index.

3. **The overall GII score** is the simple average of the Input and Output Sub-Indices.

4. **The Innovation Efficiency Ratio** is the ratio of the Output Sub-Index to the Input Sub-Index. It shows how much innovation output a given country is getting for its inputs.

Each pillar is divided into three sub-pillars, each of which is composed of individual indicators, for a total of 79 indicators. The GII pays special attention to presenting a scoreboard for each economy that includes strengths and weaknesses (Appendix I Country/Economy Profiles), making accessible the data series (Appendix II Data Tables), and providing data sources and definitions (Appendix III) and detailed technical notes (Appendix IV). Adjustments to the GII framework, including a detailed analysis of the factors influencing year-on-year changes, are detailed in Annex 2. In addition, since 2011 the GII has been submitted to an independent statistical audit performed by the Joint Research Centre of the European Union (results are detailed in Annex 3).

A table is included here for each pillar. That table provides a list of the pillar's indicators, specifying their type (composite indicators are identified with an asterisk '*', survey questions with a dagger '†', and the remaining indicators are hard data); their weight in the index (indicators with half weight are identified with the letter 'a'); and the direction of their effect (indicators for which higher values imply worse outcomes are identified with the letter 'b'). The table then provides each indicator's average values (in their respective units) per income group (World Bank classification) and for the whole sample of 141 economies retained in the final computation (Tables 1a through 1g).

Table 1a: Institutions pillar

		Average value by income group				
	Indicator	High income	Upper-middle income	Lower-middle income	Low income	Mean
1	**Institutions**					
1.1	*Political environment*					
1.1.1	Political stability*	0.70	−0.23	−0.57	−0.83	−0.08
1.1.2	Government effectiveness*	1.18	−0.10	−0.48	−0.84	0.14
1.2	*Regulatory environment*					
1.2.1	Regulatory quality*[a]	1.12	−0.07	−0.42	−0.70	0.16
1.2.2	Rule of law*[a]	1.13	−0.30	−0.59	−0.81	0.04
1.2.3	Cost of redundancy dismissal, salary weeks[b]	14.55	18.98	25.63	20.05	19.23
1.3	*Business environment*					
1.3.1	Ease of starting a business*	89.53	82.42	82.20	68.95	82.78
1.3.2	Ease of resolving insolvency*	68.18	49.08	36.67	36.62	50.73
1.3.3	Ease of paying taxes*	83.06	69.42	61.05	62.94	71.08

Note: (*) index, (†) survey question, (a) half weight, (b) higher values indicate worse outcomes.

The Innovation Input Sub-Index

The first sub-index of the GII, the Innovation Input Sub-Index, has five enabler pillars: Institutions, Human capital and research, Infrastructure, Market sophistication, and Business sophistication. Enabler pillars define aspects of the environment conducive to innovation within an economy.

Pillar 1: Institutions

Nurturing an institutional framework that attracts business and fosters growth by providing good governance and the correct levels of protection and incentives is essential to innovation. The Institutions pillar captures the institutional framework of a country (Table 1a).

The Political environment sub-pillar includes three indices that reflect perceptions of the likelihood that a government might be destabilized; the quality of public and civil services, policy formulation, and implementation.

The Regulatory environment sub-pillar draws on two indices aimed at capturing perceptions on the ability of the government to formulate and implement cohesive policies that promote the development of the private sector and at evaluating the extent to which the rule of law prevails (in aspects such as contract enforcement, property rights, the police, and the courts). The third indicator evaluates the cost of redundancy dismissal as the sum, in salary weeks, of the cost of advance notice requirements added to severance payments due when terminating a redundant worker.

The Business environment sub-pillar expands on three aspects that directly affect private entrepreneurial endeavours by using the World Bank indices on the ease of starting a business; the ease of resolving insolvency (based on the recovery rate recorded as the cents on the dollar recouped by creditors through reorganization, liquidation, or debt

Table 1b: Human capital & research pillar

	Indicator	Average value by income group: High income	Upper-middle income	Lower-middle income	Low income	Mean
2	**Human capital and research**					
2.1	*Education*					
2.1.1	Expenditure on education, % GDP	5.25	4.66	4.79	4.02	4.79
2.1.2	Govt expend. on edu./pupil, secondary[1]	25.32	17.82	20.17	25.45	22.38
2.1.3	School life expectancy, years	16.10	13.85	11.49	9.65	13.37
2.1.4	PISA scales in reading, maths & science[a]	496.34	427.85	360.19	n/a	469.85
2.1.5	Pupil-teacher ratio, secondary[a,b]	10.89	15.46	19.75	29.25	17.39
2.2	*Tertiary education*					
2.2.1	Tertiary enrolment, % gross[a]	65.03	42.16	24.31	7.73	40.44
2.2.2	Graduates in science & engineering, %	22.70	21.40	18.96	17.59	20.98
2.2.3	Tertiary inbound mobility, %[a]	9.52	4.04	1.50	1.94	5.31
2.3	*Research and development (R&D)*					
2.3.1	Researchers, FTE/mn pop.	3,683.00	733.34	266.97	53.44	1,761.81
2.3.2	Gross expenditure on R&D, % GDP	1.64	0.55	0.28	0.38	0.91
2.3.3	QS university ranking, average score top 3*	43.92	17.58	5.81	0.63	21.18

Note: (*) index, (†) survey question, (a) half weight, (b) higher values indicate worse outcomes.
1 Scaled by percent of GDP per capita.

Table 1c: Infrastructure pillar

	Indicator	Average value by income group: High income	Upper-middle income	Lower-middle income	Low income	Mean
3	**Infrastructure**					
3.1	*Information and communication technologies (ICTs)*					
3.1.1	ICT access*	7.99	5.58	4.07	2.53	5.63
3.1.2	ICT use*	6.24	3.13	1.59	0.49	3.47
3.1.3	Government's online service*	0.71	0.46	0.36	0.22	0.48
3.1.4	E-participation*	0.67	0.46	0.39	0.25	0.48
3.2	*General infrastructure*					
3.2.1	Electricity output, kWh/cap[a]	9,572.81	2,788.14	1,401.56	412.03	4,841.24
3.2.2	Logistics performance*[a]	3.54	2.89	2.64	2.50	3.00
3.2.3	Gross capital formation, % GDP	20.55	25.16	24.32	24.36	23.25
3.3	*Ecological sustainability*					
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	8.09	8.58	7.23	4.48	7.71
3.3.2	Environmental performance*	70.37	53.78	42.71	33.17	53.57
3.3.3	ISO 14001 environ. certificates/bn PPP$ GDP[a]	4.16	2.60	0.43	0.49	2.33

Note: (*) index, (†) survey question, (a) half weight, (b) higher values indicate worse outcomes.

enforcement/foreclosure proceedings); and the ease of paying taxes.

Pillar 2: Human capital and research

The level and standard of education and research activity in a country are prime determinants of the innovation capacity of a nation. This pillar tries to gauge the human capital of countries (Table 1b).

The first sub-pillar includes a mix of indicators aimed at capturing achievements at the elementary and secondary education levels. Education expenditure and school life expectancy are good proxies for coverage. Government expenditure per pupil, secondary gives a sense of the level of priority given to secondary education by the state. The quality of education is measured through the results to the OECD Programme for International Student Assessment (PISA), which examines 15-year-old students' performances in reading, mathematics, and science, as well as the pupil-teacher ratio.

Higher education is crucial for economies to move up the value chain beyond simple production processes and products. The sub-pillar on tertiary education aims at capturing coverage (tertiary enrolment); priority is given to the sectors traditionally associated with innovation (with a series on the percentage of tertiary graduates in science and engineering, manufacturing, and construction); and the inbound and mobility of tertiary students, which plays a crucial role in the exchange of ideas and skills necessary for innovation.

The last sub-pillar, on R&D, measures the level and quality of R&D activities, with indicators on researchers (full-time equivalence), gross expenditure, and the quality of scientific and research institutions as measured by the average score of the top three universities in the QS World University Ranking of 2014. By design, this indicator aims at capturing the availability of at least three higher education institutions of quality within each economy (i.e., included in the global top 700), and is not aimed at assessing the average level of all institutions within a particular economy.

Pillar 3: Infrastructure

The third pillar includes three sub-pillars: Information and communication technologies (ICTs), General infrastructure, and Ecological sustainability (Table 1c).

Good and ecologically friendly communication, transport, and energy infrastructures facilitate the production and exchange of ideas, services, and goods and feed into the innovation system through increased productivity and efficiency, lower transaction costs, better access to markets, and sustainable growth.

The ICTs sub-pillar includes four indices developed by international organizations on ICT access, ICT use, online service by governments, and online participation of citizens.

The sub-pillar on general infrastructure includes the average of electricity output in kWh per capita; a composite indicator on logistics performance; and gross capital formation, which consists of outlays on additions to the fixed assets and net inventories of the economy, including land improvements (fences, ditches, drains); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings.

The sub-pillar on ecological sustainability includes three indicators: GDP per unit of energy use (a measure of efficiency in the use of energy), the Environmental Performance Index of Yale and Columbia Universities, and the number of certificates of conformity with standard ISO 14001 on environmental management systems issued.

Pillar 4: Market sophistication

The ongoing global financial crisis has underscored how crucial the availability of credit, investment funds, and access to international markets is for businesses to prosper. The Market sophistication pillar has three sub-pillars structured around market conditions and the total level of transactions (Table 1d).

The Credit sub-pillar includes a measure on the ease of getting credit aimed at measuring the degree to which collateral and bankruptcy laws facilitate lending by protecting the rights of borrowers and lenders, as well as the rules and practices affecting the coverage, scope, and accessibility of credit information. Transactions are given by the total value of domestic credit and, in an attempt to make the model more applicable to emerging markets, by the gross loan portfolio of microfinance institutions.

Table 1d: Market sophistication pillar

		Average value by income group				
	Indicator	High income	Upper-middle income	Lower-middle income	Low income	Mean
4	**Market sophistication**					
4.1	*Credit*					
4.1.1	Ease of getting credit*	57.71	53.16	49.26	31.67	50.57
4.1.2	Domestic credit to private sector, % GDP	110.10	56.65	37.21	22.92	65.64
4.1.3	Microfinance gross loans, % GDP	0.14	0.89	2.66	2.74	1.88
4.2	*Investment*					
4.2.1	Ease of protecting investors*	60.90	56.12	48.97	47.26	54.70
4.2.2	Market capitalization, % GDP[a]	64.61	42.25	24.27	31.35	47.65
4.2.3	Total value of stocks traded, % GDP[a]	38.95	13.09	3.50	3.59	21.76
4.2.4	Venture capital deals/tr PPP$ GDP[a]	0.23	0.08	0.03	0.04	0.15
4.3	*Trade and competition*					
4.3.1	Applied tariff rate, weighted mean, %[a,b]	2.32	5.79	6.38	8.76	5.19
4.3.2	Intensity of local competition[†]	5.45	4.77	4.79	4.73	5.02

Note: (*) index, ([†]) survey question, (a) half weight, (b) higher values indicate worse outcomes.

Table 1e: Business sophistication pillar

		Average value by income group				
	Indicator	High income	Upper-middle income	Lower-middle income	Low income	Mean
5	**Business sophistication**					
5.1	*Knowledge workers*					
5.1.1	Knowledge-intensive employment, %	38.46	22.40	17.34	5.35	26.26
5.1.2	Firms offering formal training, % firms	40.64	41.47	31.98	30.72	36.37
5.1.3	GERD performed by business, %[a]	1.09	0.27	0.08	0.07	0.63
5.1.4	GERD financed by business, %[a]	43.44	27.45	17.12	6.08	31.66
5.1.5	Females emp. w/ adv. degrees, % tot. emp.[a]	18.48	12.56	10.34	2.45	14.29
5.2	*Innovation linkages*					
5.2.1	University/industry research collaboration[†]a	4.50	3.52	3.24	3.10	3.75
5.2.2	State of cluster development[†]	4.36	3.67	3.61	3.40	3.87
5.2.3	GERD financed by abroad, %	13.16	9.98	10.60	31.15	14.09
5.2.4	JV-strategic alliance deals/tr PPP$ GDP[a]	0.03	0.01	0.01	0.01	0.02
5.2.5	Patent families filed in 3+ offices/bn PPP$ GDP[a]	0.98	0.10	0.03	0.06	0.46
5.3	*Knowledge absorption*					
5.3.1	Royaly & license fees pay'ts, % total trade[a]	1.74	0.55	0.50	0.12	0.87
5.3.2	High-tech imports less re-imports, % tot. trade	9.25	9.13	6.86	7.32	8.42
5.3.3	Comm., comp. & info services imp., % tot. trade	1.41	0.86	0.82	1.75	1.16
5.3.4	FDI net inflows, % GDP	4.02	3.89	3.66	5.22	4.07

Note: (*) index, ([†]) survey question, (a) half weight, (b) higher values indicate worse outcomes.

The Investment sub-pillar includes the ease of protecting investors index as well as three indicators on the level of transactions. To show whether market size is matched by market dynamism, stock market capitalization is complemented by the total value of shares traded. The last metric is a hard data metric on venture capital deals, taking into account a total of 19,462 deals in 73 countries in 2014.

The last sub-pillar tackles trade and competition. The market conditions for trade are given in the first indicator measuring the average tariff rate weighted by import shares. The second indicator is a survey question that reflects on the intensity of competition in local markets. Efforts made at finding hard data on competition have so far proved unsuccessful.

Pillar 5: Business sophistication

The last enabler pillar tries to capture the level of business sophistication to assess how conducive firms are to innovation activity (Table 1e).

The Human capital and research pillar (pillar 2) made the case that the accumulation of human capital through education, and particularly higher education and the prioritization of R&D activities, is an indispensable condition for innovation to take place. That logic is taken one step further here with the assertion that businesses foster their productivity, competitiveness, and innovation potential with the employment of highly qualified professionals and technicians.

The first sub-pillar includes four quantitative indicators on knowledge workers: employment in knowledge-intensive services; the availability of formal training at the firm level; R&D performed by business enterprise (GERD) as a percentage of GDP (i.e., GERD over GDP); and the percentage of total gross expenditure of R&D that is financed by business enterprise. In addition, the sub-pillar includes an indicator related to the percentage of females employed with advanced degrees. This indicator, in addition to providing a glimpse into the gender labour distributions of nations, offers more information about the degree of sophistication of the local human capital currently employed.

Innovation linkages and public/private/academic partnerships are essential to innovation. In emerging markets, pockets of wealth have developed around industrial or technological clusters and networks, in sharp contrast to the poverty that may prevail in the rest of the territory. The Innovation linkages sub-pillar draws on both qualitative and quantitative data regarding business/university collaboration on R&D, the prevalence of well-developed and deep clusters, the level of gross R&D expenditure financed by abroad, and the number of deals on joint ventures and strategic alliances. The latter covers a total of 1,623 deals announced in 2014, with firms headquartered in 104 participating economies.[7] In addition, the total number of Patent Cooperation Treaty (PCT) and national office published patent family applications filed by residents in at least three offices proxies for international linkages.

In broad terms, pillar 4 on market sophistication makes the case that well-functioning markets contribute to the innovation environment through competitive pressure, efficiency gains, and economies of transaction and by allowing supply to meet demand. Markets that are open to foreign trade and investment have the additional effect of exposing domestic firms to best practices around the globe, which is critical to innovation through knowledge absorption and diffusion, which are considered in pillars 5 and 6. The rationale behind sub-pillars 5.3 on knowledge absorption (an enabler) and 6.3 on knowledge diffusion (a result)—two sub-pillars designed to be mirror images of each other—is precisely that together they will reveal how good countries are at absorbing and diffusing knowledge.

Sub-pillar 5.3 includes four statistics that are linked to sectors with high-tech content or are key to innovation: royalty and license fees payments as a percentage of total trade; high-tech imports (net of re-imports) as a percentage of total imports; imports of communication, computer and information services as a percentage of total trade; and net inflows of foreign direct investment (FDI) as a percentage of GDP.

The Innovation Output Sub-Index

Innovation outputs are the results of innovative activities within the economy. Although the Output Sub-Index includes only two pillars, it has the same weight in calculating the overall GII scores as the Input Sub-Index. There are two output pillars: Knowledge and technology outputs and Creative outputs.

Pillar 6: Knowledge and technology outputs

This pillar covers all those variables that are traditionally thought to be the fruits of inventions and/or innovations (Table 1f). The first sub-pillar refers to the creation of knowledge. It includes five indicators that are the result of inventive and innovative activities: patent applications filed by residents both at the national patent office and at the international level through the PCT; utility model applications filed by residents at the national office; scientific and technical published articles in peer-reviewed journals; and an economy's number of articles (H) that have received at least H citations.

The second sub-pillar, on knowledge impact, includes statistics representing the impact of innovation activities at the micro- and macroeconomic level or related proxies: increases in labour productivity, the entry density of new firms, spending on computer software, and the number of certificates of conformity with standard ISO 9001 on quality management systems issued. To strengthen the sub-pillar, the measure of high- and medium-high-tech industrial output over total manufactures output is also included.

The third sub-pillar, on knowledge diffusion, is the mirror image of the knowledge absorption sub-pillar of pillar 5. It includes four statistics all linked to sectors with high-tech content or that are key to innovation: royalty and license fees receipts as a percentage of total trade; high-tech exports (net of re-exports) as a percentage of total exports (net

of re-exports); exports of communication, computer and information services as a percentage of total trade; and net outflows of FDI as a percentage of GDP.

Pillar 7: Creative outputs

The role of creativity for innovation is still largely underappreciated in innovation measurement and policy debates. Since its inception, the GII has always emphasized measuring creativity as part of its Innovation Output Sub-Index. The last pillar, on creative outputs, has three sub-pillars (Table 1g).

The first sub-pillar on intangible assets includes statistics on trademark applications by residents at the national office; trademark applications under the Madrid System by country of origin, and two survey questions regarding the use of ICTs in business and organizational models, new areas that are increasingly linked to process innovations in the literature.

The second sub-pillar on creative goods and services includes proxies to get at creativity and the creative outputs of an economy. Last year, in an attempt to include broader sectoral coverage, a global entertainment and media output composite was added. In addition, the indicator on audio-visual and related services exports was renamed 'Cultural and creative services exports' and expanded to include information services, advertising, market research and public opinion polling, and other, personal, cultural and recreational services (as a percentage of total trade). These two indicators complement the remainder of the sub-pillar, which measures national feature films produced in a given country (per capita count); printing and publishing output (as a percentage of total manufactures output); and creative goods exports (as a percentage of total trade), all which are aimed at providing an overall sense of the international reach of creative activities in the country.

The third sub-pillar on online creativity includes four indicators, all scaled by population aged 15 through 69 years old: generic (biz, info, org, net, and com) and country-code top level domains, average monthly edits to Wikipedia; and video uploads on YouTube. Attempts made to strengthen this sub-pillar with indicators in areas such as blog posting, online gaming, the development of applications, and have so far proved unsuccessful.

Table 1f: Knowledge & technology outputs pillar

		Average value by income group				
	Indicator	High income	Upper-middle income	Lower-middle income	Low income	Mean
6	**Knowledge and technology outputs**					
6.1	*Knowledge creation*					
6.1.1	Domestic resident patent app/bn PPP$ GDP[a]	6.87	2.89	1.73	0.48	4.04
6.1.2	PCT resident patent app/bn PPP$ GDP[a]	3.54	0.27	0.08	0.07	1.66
6.1.3	Domestic res utility model app/bn PPP$ GDP	1.70	3.46	4.30	1.14	2.79
6.1.4	Scientific & technical articles/bn PPP$ GDP[a]	29.72	11.10	6.03	8.89	15.79
6.1.5	Citable documents H index*[a]	355.48	128.16	82.79	69.29	185.84
6.2	*Knowledge impact*					
6.2.1	Growth rate of PPP$ GDP/worker, %	0.72	1.62	3.20	2.61	1.70
6.2.2	New businesses/th pop. 15–64[a]	6.03	3.41	0.94	0.37	3.58
6.2.3	Computer software spending, % GDP[a]	0.49	0.31	0.25	0.27	0.38
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP[a]	15.27	9.60	2.61	1.16	8.59
6.2.5	High- & medium-high-tech manufactures, %[a]	31.81	24.43	15.82	6.30	24.39
6.3	*Knowledge diffusion*					
6.3.1	Royalty & license fees receipts, % total trade[a]	1.08	0.11	0.22	0.18	0.50
6.3.2	High-tech exports less re-exports, % tot. trade[a]	6.44	4.35	1.53	0.28	3.90
6.3.3	Comm., comp. & info. services exp., % tot. trade[a]	2.41	1.48	2.06	2.02	2.02
6.3.4	FDI net outflows, % GDP	16.13	6.80	0.33	0.63	8.24

Note: (*) index, (†) survey question, (a) half weight, (b) higher values indicate worse outcomes.

Table 1g: Creative outputs pillar

		Average value by income group				
	Indicator	High income	Upper-middle income	Lower-middle income	Low income	Mean
7	**Creative outputs**					
7.1	*Intangible assets*					
7.1.1	Domestic res trademark app/bn PPP$ GDP	61.69	51.77	57.27	21.96	54.44
7.1.2	Madrid trademark applications/bn PPP$ GDP[a]	2.01	0.67	0.61	0.05	1.31
7.1.3	ICTs & business model creation†	4.92	4.20	4.06	3.85	4.38
7.1.4	ICTs & organizational models creation†	4.77	4.01	3.87	3.60	4.19
7.2	*Creative goods and services*					
7.2.1	Cultural & creative services exp., % total trade[a]	0.80	0.47	0.22	0.04	0.52
7.2.2	National feature films/mn pop. 15–69[a]	8.95	4.11	5.23	1.07	6.10
7.2.3	Global ent. & media output/th pop. 15–69[a]	1.34	0.25	0.05	0.07	0.87
7.2.4	Printing & publishing manufactures, %	2.99	1.75	1.35	1.63	2.22
7.2.5	Creative goods exports, % total trade	1.73	1.90	0.65	0.10	1.31
7.3	*Online creativity*					
7.3.1	Generic TLDs/th pop. 15–69	37.96	9.19	1.60	0.35	15.84
7.3.2	Country-code TLDs/th pop. 15–69	38.02	8.95	1.17	0.18	15.66
7.3.3	Wikipedia monthly edits/mn pop. 15–69	5,306.45	1,704.75	577.19	55.38	2,413.32
7.3.4	Video uploads on YouTube/pop. 15–69	85.59	70.47	48.95	21.28	74.32

Note: (*) index, (†) survey question, (a) half weight, (b) higher values indicate worse outcomes. Scores rather than values are presented for indicators 7.3.1, 7.3.2, and 7.3.4.

Notes

1 For a fuller introduction to the Global Innovation Index, see the GII 2011. Examples of other composite innovation indices were reviewed there too. The Global Innovation Policy Index of the Information Technology and Innovation Foundation, which is quite complementary to the GII, was formulated in 2012.

2 Eurostat and OECD, 2005.

3 OECD, 2010; INSEAD, 2011; and WIPO, 2011.

4 INSEAD, 2011; OECD Scoreboard, 2013; WIPO, 2011.

5 INSEAD, 2011; OECD, 2011; WIPO, 2011

6 For completeness, 2.3% of data points are from 2010, 1.1% from 2009, 0.8% from 2008, 0.5% from 2007, 0.4% from 2006, 0.3% from 2005, and 0.2% from 2004. In addition, the GII is calculated on the basis of 9,386 data points (compared to 11,139 with complete series), implying that 15.7% of data points are missing. Data Tables (Appendix II) include the reference year for each data point and mark missing data as not available (n/a).

7 These data were determined from a query on joint ventures/strategic alliances deals announced in 2014 from Thomson Reuters SDC Platinum database. A count variable was created: each participating nation of each company in a deal (*n* countries per deal) gets, per deal, a score equivalent to 1/*n* so that all country scores add up to the total number of deals.

References

Cornell University, INSEAD, and WIPO (World Intellectual Property Organization). 2013. *The Global Innovation Index 2013: The Local Dynamics of Innovation*, eds. S. Dutta and B. Lanvin. Geneva, Ithaca, and Fontainebleau: Cornell, INSEAD, and WIPO.

———. 2014. *The Global Innovation Index 2014: The Human Factor in Innovation,* eds. S. Dutta, B. Lanvin, and S. Wunsch-Vincent. Geneva, Ithaca, and Fontainebleau: Cornell, INSEAD, and WIPO. 3–68.

Eurostat and OECD (Organisation for Economic Co-operation and Development). 2005. *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data,* 3rd edition. Paris: OECD.

INSEAD. 2011. *The Global Innovation Index 2011: Accelerating Growth and Development,* ed. S. Dutta. Fontainebleau: INSEAD.

OECD (Organisation for Economic Co-operation and Development). 2010. *The OECD Innovation Strategy: Getting a Head Start on Tomorrow.* Paris: OECD.

———. 2013. *OECD Science, Technology and Industry Scoreboard 2013.* Paris: OECD.

UNCTAD/UNDP (United Nations Conference on Trade and Development/United Nations Development Programme). 2008. *Creative Economy: Report 2008.* New York: UN. Available at http://www.unctad.org/en/docs/ditc20082cer_en.pdf.

———. 2010. *Creative Economy: Report 2010.* New York: UN. Available at http://www.unctad.org/en/docs/ditctab20103_en.pdf.

WIPO (World Intellectual Property Organization), 2011. 'The Changing Nature of Innovation and Intellectual Property'. In *World Intellectual Property Report 2011: The Changing Face of Innovation,* Chapter 1. Geneva: WIPO. Available at http://www.wio.int/econ_stat/en/economics/publications.html.

Adjustments to the Global Innovation Index Framework and Year-on-Year Comparability of Results

The Global Innovation Index (GII) is a cross-country performance assessment, compiled on an annual basis, which continuously seeks to update and improve the way innovation is measured. The GII report pays special attention to making accessible the statistics used in the Country/Economy Profiles and Data Tables, providing data sources and definitions and detailing the computation methodology (Appendices I, II, III, and IV, respectively). This annex summarizes the changes made this year and provides an assessment of the impact of these changes on the comparability of rankings.

Table 1: Changes to the Global Innovation Index framework

GII 2014		Adjustment	GII 2015	
1.1.3	Press Freedom Index*	Deleted		
2.3.1	Researchers, headcounts/mn pop.	Methodology changed	2.3.1	Researchers, FTE/mn pop.
4.3.2	Non-agricultural mkt access weighted tariff, %	Deleted		
4.3.3	Intensity of local competition	Number changed	4.3.2	Intensity of local competition
5.1.4	GERD performed by business enterprise, %	Methodology changed	5.1.4	GERD financed by business enterprise, %
5.1.5	GMAT test takers/mn pop. 20–34	Replaced	5.1.5	Females employed with advanced degrees, % total employed

* Currently searching for a better variable to capture the openness of an economy to innovation.

Adjustments to the Global Innovation Index framework

The GII model is revised every year in a transparent exercise. This year, no change was made at the pillar or sub-pillar level.

Beyond the use of World Intellectual Property Organization (WIPO) data, we collaborate with both public international bodies such as the International Energy Agency; the United Nations Educational, Scientific and Cultural Organization (UNESCO); and the International Telecommunication Union (ITU) as well as private organizations such as the International Organization for Standardization (ISO); IHS Global Insight; QS Quacquarelli Symonds Ltd; ZookNIC Inc; Google; and PwC to obtain the best available data on innovation measurement globally.

Although the rationale for the adjustments made to the GII framework is explained in detail in Annex 1, Table 1 provides a summary of these changes for quick reference. A total of six indicators were modified this year: three indicators were deleted or replaced, two underwent methodological changes (new computation methodology at the source), and one changed its indicator number as a result of the framework adjustments.

The statistical audit performed by the Joint Research Centre (see Annex 3) provides a confidence interval for each ranking following a robustness and uncertainty analysis of the modelling assumptions.

Sources of changes in the rankings

The GII compares the performance of national innovation systems across economies, but it also presents changes in economy rankings over time.

Importantly, scores and rankings from one year to the next are not directly comparable (see Annex 2 of the GII 2013 for a full explanation). Making inferences about absolute or relative performance on the basis of year-on-year differences in rankings can be misleading. Each ranking reflects the relative positioning of that particular country/economy on the basis of the conceptual framework, the data coverage, and the sample of economies—elements that change from one year to another.

A few particular factors influence the year-on-year ranking of a country/economy:

- the actual performance of the economy in question;
- adjustments made to the GII framework;

Table 2: Changes in GDP PPP$ values

Economy	GDP PPP$ per former ICP	GDP PPP$ per revised ICP	Change
Zimbabwe	7.40	25.92	246%
Zambia	25.45	57.08	124%
United Arab Emirates	269.82	570.57	111%
Nigeria	478.53	972.65	103%
Myanmar	111.12	221.48	99%
Indonesia	1,284.78	2,511.44	95%
Jordan	40.02	76.11	90%
Mongolia	17.03	31.78	87%
Algeria	284.68	522.31	83%
Kuwait	154.23	276.31	79%
Sudan	89.97	151.69	69%
Bahrain	34.96	58.28	67%
Egypt	551.44	909.82	65%
Saudi Arabia	927.76	1,527.73	65%
Oman	94.86	155.46	64%
Yemen	62.61	102.33	63%
Kazakhstan	243.56	395.46	62%

- data updates, the treatment of outliers, and missing values; and
- the inclusion or exclusion of countries/economies in the sample.

Additionally, the following characteristics complicate the time-series analysis based on simple GII scores or rankings:

- **Missing values.** The GII produces relative index scores, which means that a missing value for one economy affects the index score of other economies. Because the number of missing values decreases every year, this problem is reduced over time.
- **Reference year.** The data underlying the GII do not refer to a single year but to several years, depending on the latest available year for any given variable. In addition, the reference years for different variables are not the same for each economy. The motivation for this approach is that it widens the set of data points for cross-economy comparability.
- **Normalization factor.** Most GII variables are normalized using either GDP or population. This approach is also intended to enable cross-economy comparability. Yet, again, year-on-year changes in individual variables may be driven either by the variable's numerator or by its denominator.
- **Consistent data collection.** Finally, measuring year-on-year performance changes relies on the consistent collection of data over time. Changes in the definition of variables or in the data collection process could create movements in the rankings that are unrelated to true performance.

A detailed economy study based on the GII database and the country/economy profile over time, coupled with analytical work on grounds that include innovation actors and decision makers, yields the best results in terms of grasping an economy's innovation performance over time as well as possible avenues for improvement.

Methodology and data

The revision of the computation methodology for certain individual indicators has caused significant shifts in the results for several countries. The methodologies underpinning indicators 3.1.3 Government Online Service Index and 3.1.4 E-Participation Index,[1] both computed by the United Nations, have been revised.

Similarly, the World Bank's International Comparison Programme (ICP) has revised the methodology used to compute the purchasing power parity (PPP) conversion factor. This factor is used to compute the GDP in PPP current international dollars (PPP$ GDP), a scaling factor used to enable country comparisons for variables 3.3.3, 4.2.4, 5.2.4, 5.2.5, 6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.2.4, 7.1.1, and 7.1.2. This choice of denominator was dictated by a willingness to appropriately account for differences in development stages; in addition, scaling these variables by population would improperly bias results to the detriment of economies with large young or large ageing populations.

As a result, PPP estimates are not comparable with those published in previous editions and, in some countries, they differ significantly. Table 2 details those countries that were most affected by the revised PPP values, using the 2013 reference year as an example.

Because of a larger revised PPP$ GDP figure, some of the GII scores for the variables scaled by this factor have decreased for those countries, partly affecting their rankings in these variables.[2] However, in some

instances an economy's numerator for these variables has actually decreased from last year to this year, which can be another, unrelated reason for a lower score. The impact of the PPP$ GDP revision in the overall GII rankings is negligible.

Missing values

When it comes to country coverage, the objective is to include as many economies as possible. To be included in the GII, economies must have a minimum data coverage of 48 indicators out of 79 (60%) and scores for at least two sub-pillars per pillar. Missing values are indicated with 'n/a' and are not considered in the sub-pillar score.

Since its inception, the GII has had a positive influence on data availability, increasing awareness of the importance of submitting timely data. The number of data points submitted by economies to international data agencies has substantially increased in recent years. However, eradicating missing values can have an initial negative affect on an economy's GII ranking (this can be viewed as a structural break in the time series). Over time, these results are smoothed out and the effect is a more positive and accurate ranking.

For several economies, the number of missing data points remains very high. Table 3 lists the countries that have the highest number of missing data points (20 or more), ranking them according to how many data points are missing.

Conversely, Table 4 lists those economies with the best data coverage, ranking them according to the least number of missed data points. These economies are missing at most only five data points; some are missing none at all.

Table 3: GII economies with the most missing values

Economy	Number of missing values
Seychelles	31
Angola	31
Togo	31
Gambia	30
Uzbekistan	30
Myanmar	30
Sudan	30
Cabo Verde	29
Lesotho	29
Burundi	29
Fiji	28
Swaziland	28
Niger	28
Guinea	28
Guyana	27
Bhutan	27
Nicaragua	27
Barbados	26
Bosnia and Herzegovina	24
Cambodia	23
Malawi	23
Honduras	23
Zimbabwe	23
Yemen	23
Rwanda	22
Cameroon	22
Côte d'Ivoire	22
Nepal	22
United Arab Emirates	21
Trinidad and Tobago	21
Mali	21
Tajikistan	21
Zambia	21
Kuwait	20
Jamaica	20
Burkina Faso	20

Table 4: GII economies with the fewest missing values

Economy	Number of missing values
Hungary	0
Poland	0
Germany	1
Czech Republic	1
Spain	1
Portugal	1
Russian Federation	1
Colombia	1
Finland	2
Korea, Rep.	2
Austria	2
Japan	2
France	2
Italy	2
Malaysia	2
Bulgaria	2
Greece	2
Romania	2
Turkey	2
Ukraine	2
United Kingdom	3
Sweden	3
Netherlands	3
Denmark	3
New Zealand	3
Australia	3
Israel	3
Estonia	3
Chile	3
Thailand	3
Brazil	3
Ireland	4
Norway	4
Belgium	4
Slovenia	4
Latvia	4
Slovakia	4
Lithuania	4
Mexico	4
Serbia	4
Indonesia	4
United States of America	5
Costa Rica	5
South Africa	5
Argentina	5
Philippines	5

Notes

1 The Government Online Service Index this year focuses more on e-participation in particular, and on the presence of open data initiatives on government websites, than it did in previous editions. The 2014 version of the E-Government Survey expanded the assessment of e-participation so as to include also the use of e-government programmes to engage citizens in public policy making and implementation. The survey was updated to improve the accuracy of the information collected on e-consultation and e-decision-making initiatives. New questions and updates were also made to better assess data publishing and sharing by government agencies; the availability of information on the citizens' rights to access government information; the provision of outcome on feedback received from citizens concerning the improvement of its online services; and the provision of tools in order to obtain public opinion for public policy deliberation through social media, online polls, petition tools, voting tools, online-bulletin boards, and online discussion forums.

2 Notable instances of decreased scores include Bahrain (for indicator 7.1.1), Indonesia (3.3.3, 6.2.4), Jordan (7.1.1), Kazakhstan (7.1.1), Saudi Arabia (3.3.3, 6.1.4), Sudan (3.3.3), and United Arab Emirates (3.3.3).

Joint Research Centre Statistical Audit of the 2015 Global Innovation Index

Michaela Saisana and **Marcos Domínguez-Torreiro,** European Commission, Joint Research Centre (JRC), Ispra, Italy

Conceptual and practical challenges are inevitable when trying to understand and model the fundamentals of innovation at the national level worldwide. The Global Innovation Index (GII) considers these conceptual challenges in Chapter 1 and deals with practical challenges—related to data quality and methodological choices—by grouping country-level data into 21 sub-pillars, 7 pillars, 2 sub-indices, and, finally, an overall index. The object of this annex is to offer a detailed insight into the practical issues related to the construction of the index, analysing in-depth the statistical soundness of the calculations and assumptions made to arrive at the final index rankings. Notwithstanding, statistical soundness should be regarded as a necessary but not sufficient condition for a sound GII, since the correlations underpinning the majority of the statistical analyses carried out herein 'need not necessarily represent the real influence of the individual indicators on the phenomenon being measured'.[1] Consequently, the development of the GII must be nurtured by a dynamic iterative dialogue between the principles of statistical and conceptual soundness or, to put it another way, between the theoretical understanding of innovation and the empirical observations of the data underlying the variables.

The Econometrics and Applied Statistics at the European Commission Joint Research Centre (JRC) in Ispra has been invited for the fifth consecutive year to audit the GII. As in previous editions, the present JRC audit will focus on the statistical soundness of the multi-level structure of the index as well as on the impact of key modelling assumptions on the results.[2] The external qualitative check provided by the JRC guarantees the transparency and reliability of the index for both policy makers and other stakeholders, thus facilitating more accurate priority setting and policy formulation in this particular field.

As in past GII reports, the JRC analysis complements the country rankings with confidence intervals for the GII, the Innovation Input Sub-Index and the Innovation Output Sub-Index, in order to better appreciate the robustness of these ranks to the computation methodology. In addition, the JRC analysis includes an assessment of the added value of the GII, and a measure of distance to the efficient frontier of innovation by using data envelopment analysis.

Conceptual and statistical coherence in the GII framework

An earlier version of the GII model was assessed by the JRC in April-May 2015. Fine-tuning suggestions were taken into account in the final computation of the rankings in an iterative process with the JRC aimed at setting the foundation for a balanced index. The entire process followed four steps (see Figure 1).

Step 1: Conceptual consistency

Seventy-nine indicators were selected for their relevance to a specific innovation pillar on the basis of the literature review, expert opinion, country coverage, and timeliness. To represent a fair picture of country differences, indicators were scaled either at the source or by the GII team as appropriate and where needed.

Step 2: Data checks

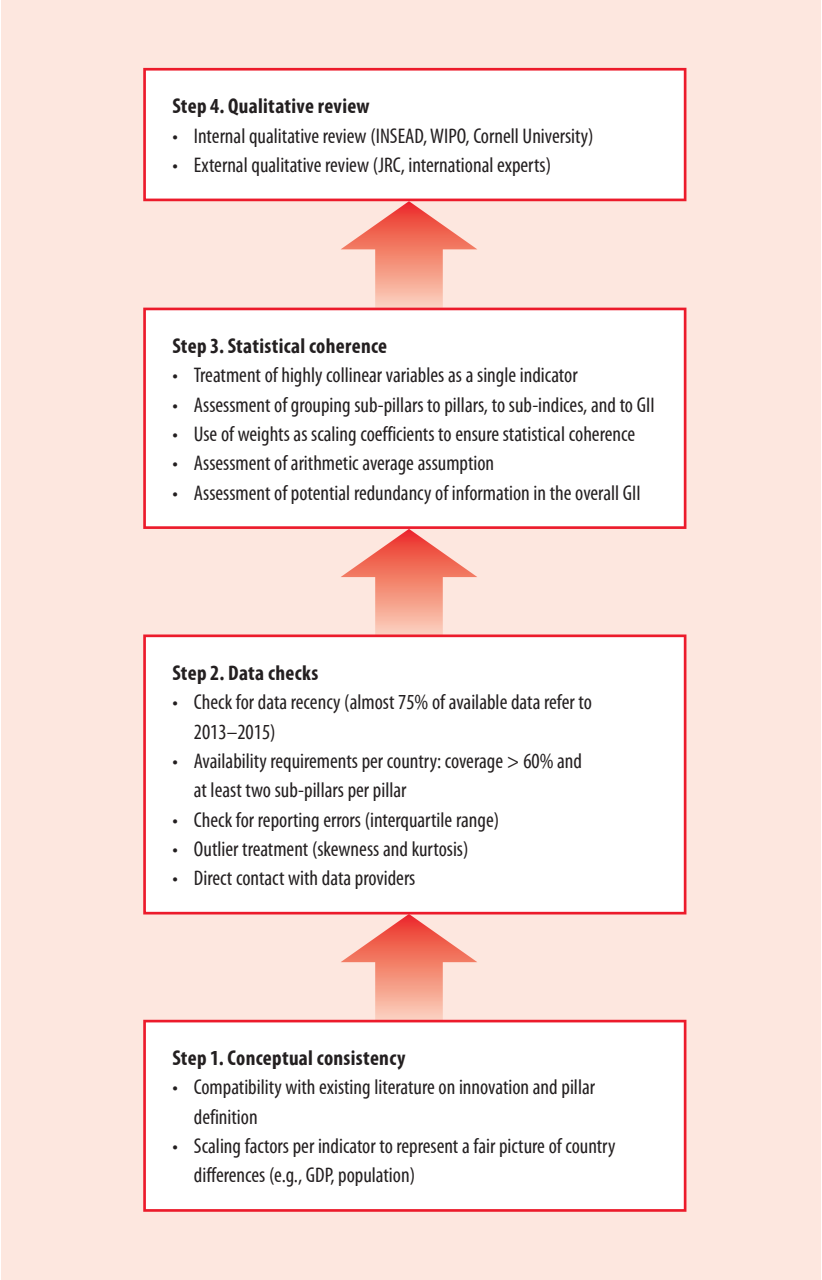
The most recently released data within the period 2004–14 were used for each economy. Almost 75% of the available data refer to 2013 or more recent years. Countries were included if data availability was at least 60% (i.e., 47 out of 79 variables) and at least two of the three sub-pillars in each pillar could be computed. Potentially problematic indicators that could bias the overall results were identified as those having absolute skewness greater than 2 and kurtosis greater than 3.5;[3] these were treated either by winsorization or by taking the natural logarithm (in case of more than five outliers). These criteria were decided jointly with the JRC back in 2011 (see Appendix IV Technical Notes in this report for details).

Step 3: Statistical Coherence

Weights as scaling coefficients

Weights of 0.5 or 1.0 were jointly decided between the JRC and the GII team in 2012 to be scaling coefficients and not importance

Figure 1: Conceptual and statistical coherence in the GII 2015 framework



Source: Saisana and Domínguez-Torreiro, European Commission Joint Research Centre, 2015.

coefficients, with the aim of arriving at sub-pillar and pillar scores that were balanced in their underlying components (i.e., that indicators and sub-pillars can explain a similar amount of variance in their respective sub-pillars/pillars). Paruolo et al. (2013) show that, in weighted arithmetic averages, the ratio of two nominal weights gives the rate of substitutability between the two indicators, and hence can be used to reveal the relative importance of individual indicators. This importance can then be compared with ex-post measures of variables' importance, such as the non-linear Pearson correlation ratio. As a result of this analysis, 36 out of 79 indicators and two sub-pillars—7.2 Creative goods and services and 7.3 Creation of online content—were assigned half weight while all other indicators and sub-pillars were assigned a weight of 1.0. Nevertheless, for five indicators with Pearson correlation coefficients that have respective sub-pillar scores below 0.5, some further reflection is needed because they seem to behave as 'noise' at all aggregation levels in the GII framework. This applies to 5.2.3 GERD financed by abroad; 5.3.4 Foreign direct investment, net inflows; 6.2.1 Growth rate of GDP per person engaged; 6.2.2 New business density; and 7.2.4 Printing and publishing output.

Principal components analysis and reliability item analysis

Principal component analysis (PCA) was used to assess to what extent the conceptual framework is confirmed by statistical approaches. PCA results confirm the presence of a single latent dimension in each of the seven pillars (one component with an eigenvalue greater than 1.0) that captures between 61% (pillar 4: Market sophistication) up to 85% (pillar 1: Institutions) of the total variance in the three underlying sub-pillars. These results reveal that the adjustments made to the 2015 GII framework have further improved the already good statistical coherence properties of the previous version. Furthermore, results confirm the expectation that the sub-pillars are more correlated to their own pillar than to any other pillar and that all coefficients are greater than 0.75 (see Table 1).

The five input pillars share a single statistical dimension that

Table 1: Statistical coherence in the GII: Correlations between sub-pillars and pillars

	Sub-pillar	Institutions	Human capital and research	Infrastructure	Market sophistication	Business sophistication	Knowledge and technology outputs	Creative outputs
INPUT	Political environment	0.94	0.75	0.79	0.69	0.75	0.67	0.80
	Regulatory environment	0.92	0.64	0.65	0.64	0.63	0.59	0.71
	Business environment	0.89	0.73	0.76	0.74	0.71	0.69	0.76
	Education	0.64	0.82	0.63	0.52	0.67	0.64	0.67
	Tertiary education	0.56	0.79	0.60	0.39	0.45	0.51	0.59
	Research and development (R&D)	0.71	0.89	0.79	0.70	0.80	0.87	0.80
	Information and communication technologies (ICTs)	0.76	0.80	0.95	0.70	0.73	0.75	0.80
	General infrastructure	0.60	0.61	0.78	0.54	0.55	0.58	0.59
	Ecological sustainability	0.67	0.68	0.83	0.65	0.65	0.69	0.75
	Credit	0.44	0.33	0.40	0.75	0.46	0.40	0.45
	Investment	0.67	0.67	0.68	0.80	0.70	0.71	0.68
	Trade and competition	0.60	0.53	0.62	0.79	0.60	0.59	0.71
	Knowledge workers	0.62	0.75	0.72	0.65	0.86	0.77	0.74
	Innovation linkages	0.72	0.65	0.65	0.70	0.76	0.67	0.74
	Knowledge absorption	0.48	0.44	0.41	0.47	0.79	0.57	0.51
OUTPUT	Knowledge creation	0.58	0.78	0.64	0.57	0.69	0.85	0.69
	Knowledge impact	0.53	0.67	0.72	0.63	0.63	0.83	0.69
	Knowledge diffusion	0.64	0.62	0.61	0.65	0.81	0.83	0.71
	Intangible assets	0.68	0.66	0.70	0.73	0.72	0.71	0.90
	Creative goods and services	0.71	0.77	0.76	0.72	0.76	0.76	0.87
	Online creativity	0.81	0.85	0.81	0.69	0.78	0.77	0.90

Source: Saisana and Dominguez-Torreiro, European Commission Joint Research Centre, 2015.

summarizes 81% of the total variance, and the five loadings (correlation coefficients) of these pillars are very similar to each other. This similarity suggests that the five pillars make roughly equal contributions to the variation of the Innovation Input Sub-Index scores, as envisaged by the developing team. The reliability of the Input Sub-Index, measured by the Cronbach alpha value, is very high at 0.95—well above the 0.70 threshold for a reliable aggregate.[4]

The two output pillars—Knowledge and technology outputs and Creative outputs—are strongly correlated to each other (0.83); they are also both strongly correlated with the Innovation Output Sub-index (0.95). This result suggests that the Output Sub-index is also well balanced in its two pillars.

Finally, building the GII as the simple average of the Input Sub-Index and Output Sub-Index is also statistically justifiable because the Pearson correlation coefficient of either sub-index with the overall GII is 0.98; the two sub-indices have a correlation of 0.93. Thus far, results show that the grouping of sub-pillars into pillars, sub-indices, and the GII 2015 is statistically coherent, and that the GII has a balanced structure at each aggregation level.

Added value of the GII

As already discussed, the Input and Output Sub-Indices correlate strongly with each other and with the overall GII. Furthermore, the five pillars in the Input Sub-Index have a very high statistical reliability. These results—the strong correlation between Input and Output Sub-Indices and the high statistical reliability of the five input pillars—may be interpreted by some as a sign of redundancy of information in the GII. However, this is not the case here. In fact, for more than 50.4% (up to 69.5%) of the 141 economies included in the GII 2015, the GII ranking and any of the seven pillar rankings differ by 10 positions or more (see Table 2). This is a desired outcome because it demonstrates the added value of the GII ranking, which helps to highlight other aspects of innovation that do not emerge directly by looking into the seven pillars separately. At the same time, this result points to the value of duly taking into account the GII pillars, sub-pillars, and individual indicators on their own merit. By doing so, country-specific strengths and bottlenecks on innovation can be identified and serve as an input for evidence-based policymaking.

Table 2: Distribution of differences between pillar and GII rankings

	Innovation Input Sub-Index				Innovation Output Sub-Index		
Rank differences (positions)	Institutions (%)	Human capital and research (%)	Infrastructure (%)	Market sophistication (%)	Business sophistication (%)	Knowledge and technology outputs (%)	Creative outputs (%)
More than 30	15.6	14.2	12.1	27.0	25.5	17.7	7.8
20–29	12.1	17.0	15.6	14.2	10.6	14.9	12.8
10–19	24.1	22.7	26.2	28.4	24.8	27.0	29.8
10 or more*	**51.8**	**53.9**	**53.9**	**69.5**	**61.0**	**59.6**	**50.4**
5–9	25.5	25.5	22.7	14.9	17.7	17.0	22.0
Less than 5	19.1	19.9	20.6	14.2	19.1	22.0	24.8
Same rank	3.5	0.7	2.8	1.4	2.1	1.4	2.8
Total†	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Saisana and Dominguez-Torreiro, European Commission Joint Research Centre, 2015.
* This column is the sum of the prior three rows.
† This column is the sum of all white rows.

Step 4: Qualitative Review

Finally, the GII results—including overall country classifications and relative performances in terms of the Innovation Input or Output Sub-Indices—were evaluated to verify that the overall results are, to a great extent, consistent with current evidence, existing research, and prevailing theory. Notwithstanding these statistical tests and the positive outcomes on the statistical coherence of the GII structure, the GII model is and has to remain open for future improvements as better data, more comprehensive surveys and assessments, and new relevant research studies become available.

The impact of modelling assumptions on the GII results

Setting up an underlying structure for the index based on a battery of pillars; choosing the individual variables to be used as indicators; deciding whether or not to impute missing data; selecting the normalization approach to be applied, the weights to be assigned, the rule of aggregation to be implemented, and other elements of the index are all modelling assumptions with a direct impact on the GII scores and rankings. The rationale for these choices is manifold. For instance, expert opinion is behind the selection of the individual indicators, common practice suggests the use of a min-max normalization approach in the [0–100] range, the treatment of outliers is driven by statistical analysis, and simplicity and parsimony criteria seem to advocate for not imputing missing data. The unavoidable uncertainty stemming from the above-mentioned modelling choices is accounted for in the robustness assessment carried out by the JRC. More precisely, the methodology applied herein allows for the joint and simultaneous analysis of the impact of such choices on the national scores, resulting in error estimates and confidence intervals calculated for the GII 2015 individual country rankings.

As suggested in the relevant literature on composite indicators,[5] the robustness assessment was based on Monte Carlo simulation and multi-modelling approaches, applied to 'error-free' data where potential outliers and eventual errors and typos have already been corrected in a preliminary stage. In particular, the three key modelling issues considered in the assessment of the GII were the pillar weights, the treatment of missing data, and the aggregation formula used.

Monte Carlo simulation comprised 1,000 runs of different sets of weights for the seven pillars in the GII. The weights were assigned to the pillars based on uniform continuous distributions centred in the reference values. The ranges of simulated weights were defined by taking into account both the need for a wide enough interval to allow for meaningful robustness checks and the need to respect the underlying principle of the GII that the Input and the Output Sub-Indices should be placed on equal footings. As a result of these considerations, the limit values of uncertainty for the five input pillars are 10%–30%; the limit values for the two output pillars are 40%–60% (see Table 3).

The GII developing team, for transparency and replicability, has always opted not to estimate missing data. The 'no imputation' choice, which is common in similar contexts, might encourage economies not to report low data values. In fact, with arithmetic average, the

Table 3: Uncertainty parameters: Missing values, aggregation, and weights

		Reference	Alternative
I.	**Uncertainty in the treatment of missing values**	**No estimation of missing data**	**Expectation Maximization (EM)**
II.	**Uncertainty in the aggregation formula at the pillar level**	**Arithmetic average**	**Geometric average**
III.	**Uncertainty intervals for the GII weights**		
GII Sub-Index	Pillar	Reference value for the weight	Distribution assigned for robustness analysis
Innovation Input	Institutions	0.2	U[0.1, 0.3]
	Human capital and research	0.2	U[0.1, 0.3]
	Infrastructure	0.2	U[0.1, 0.3]
	Market sophistication	0.2	U[0.1, 0.3]
	Business sophistication	0.2	U[0.1, 0.3]
Innovation Output	Knowledge and technology outputs	0.5	U[0.4, 0.6]
	Creative outputs	0.5	U[0.4, 0.6]

Source: Saisana and Domínguez-Torreiro, European Commission Joint Research Centre, 2015.

'no imputation' choice is equivalent to replacing missing values with the average of the available (normalized) data within each sub-pillar. To overcome this limitation, the JRC estimated missing data using the Expectation Maximization (EM) algorithm.[6]

Regarding the aggregation formula, decision-theory practitioners have challenged the use of simple arithmetic averages because of their fully compensatory nature, in which a comparative high advantage on a few indicators can compensate a comparative disadvantage on many indicators.[7] The JRC relaxed this strong perfect substitutability assumption inherent in the arithmetic average and considered instead the geometric average, which is a partially compensatory approach that rewards economies with balanced profiles and motivates economies to improve in the GII pillars in which they perform poorly, and not just in *any* GII pillar.[8]

Four models were tested based on the combination of no imputation versus EM imputation, and arithmetic versus geometric average, combined with 1,000 simulations per model (random weights versus fixed weights), for a total of 4,000 simulations for the GII and each of the two sub-indices (see Table 3 for a summary of the uncertainties considered).

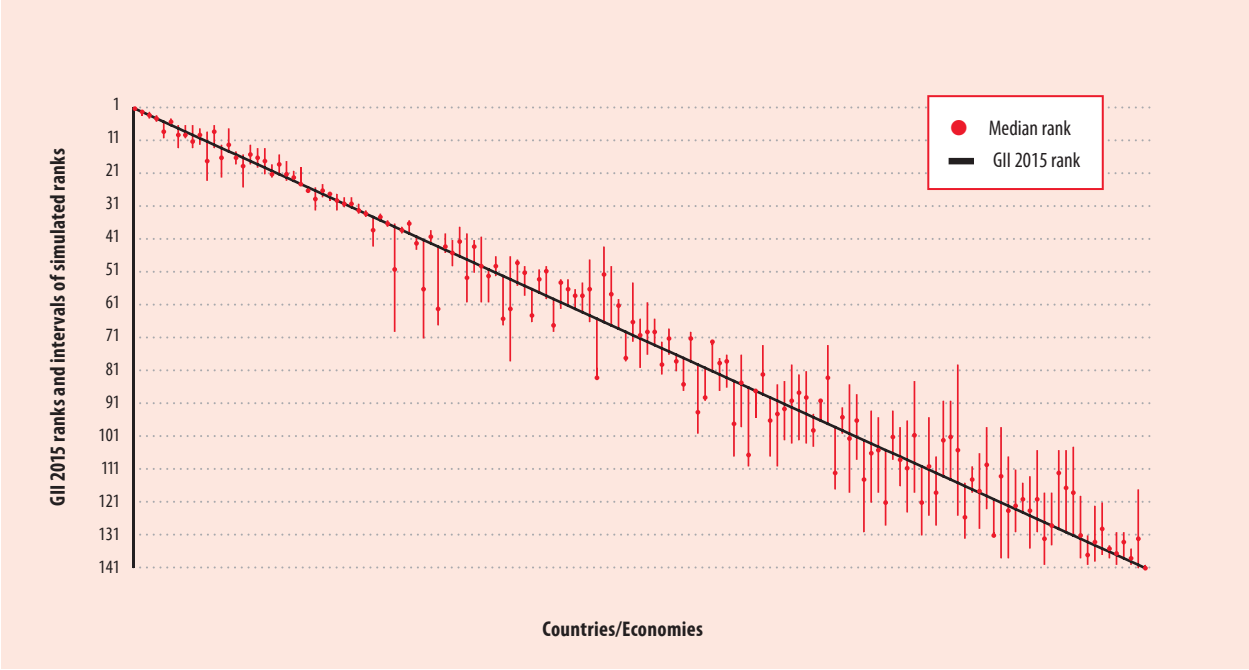
Uncertainty analysis results

The main results of the robustness analysis are shown in Figure 2 with median ranks and 90% confidence intervals computed across the 4,000 Monte Carlo simulations for the GII and the two sub-indices. The figure orders economies from best to worst according to their reference rank (black line), the dot being the median rank.

All published GII 2015 ranks lay within the simulated 90% confidence intervals, and for most economies these intervals are narrow enough for meaningful inferences to be drawn: there are fewer than 10 positions for 80 of the 141 economies. However, it is also true that some economy ranks vary significantly with changes in weights and aggregation formula and, where applicable, they also vary because of the estimation of missing data. Indeed, 32 economies have 90% confidence interval widths between 20 and 29. Confidence interval widths for another 7 economies lie between 30 and 39 (Montenegro, Uganda, Uzbekistan, Belarus, Barbados, Egypt, Kyrgyzstan), and for 2 countries (Bhutan and Fiji) the widths are 40 or greater. For these economies the GII ranks should be interpreted cautiously and certainly not taken at face value. Some caution is also warranted in the Input Sub-Index for 37 economies that have 90% confidence interval widths over 20 (up to 53 for Bosnia and Herzegovina). The Output Sub-Index is slightly more sensitive to the methodological choices: 48 countries have 90% confidence interval widths over 20 (up to 48 for Togo). This sensitivity is mostly the consequence of the estimation of missing data and the fact that there are only two pillars: this means that changes to the imputation method, weights, or aggregation formula have a more notable impact on the country ranks.

Although some economy ranks, in the GII 2015 overall or in the two sub-indices, appear to be sensitive to the methodological choices, the published rankings for the vast majority can be considered as representative of the plurality of scenarios simulated herein. Taking

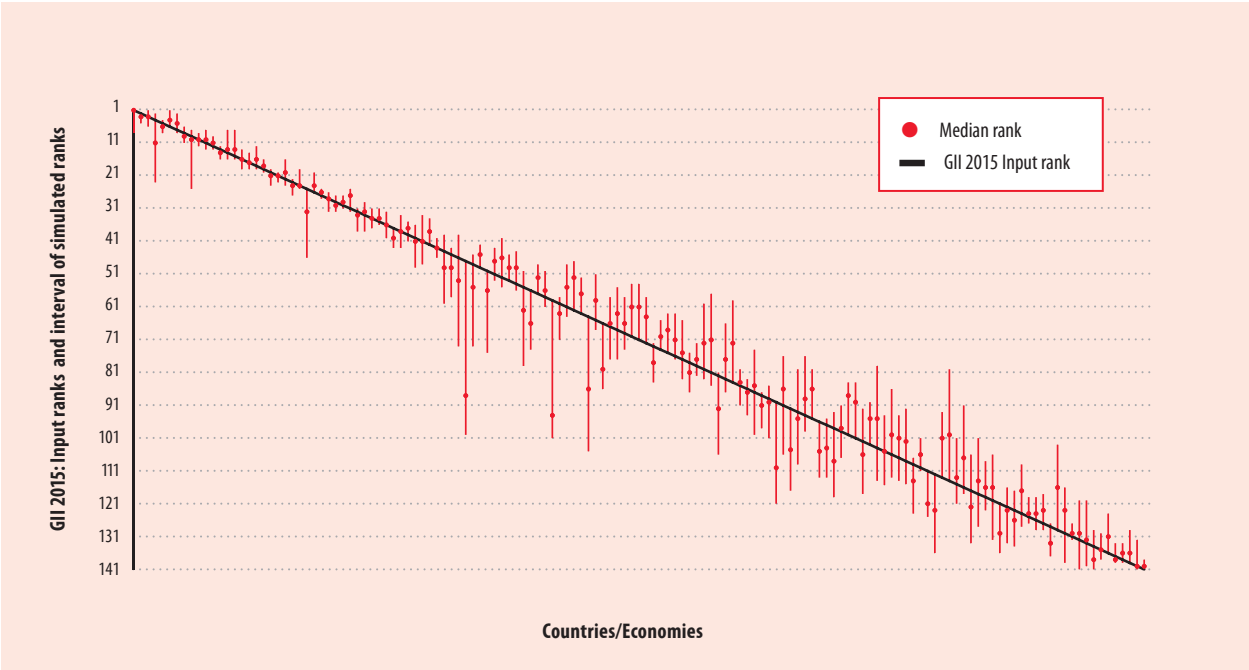
Figure 2a: Robustness analysis (GII rank vs. median rank, 90% confidence intervals)



Source: Saisana and Domínguez-Torreiro, European Commission Joint Research Centre, 2015.

Notes: Median ranks and intervals are calculated over 4,000 simulated scenarios combining random weights, imputed versus missing values, and geometric versus arithmetic average at the pillar level. The Spearman rank correlation between the median rank and the GII 2015 rank is 0.986.

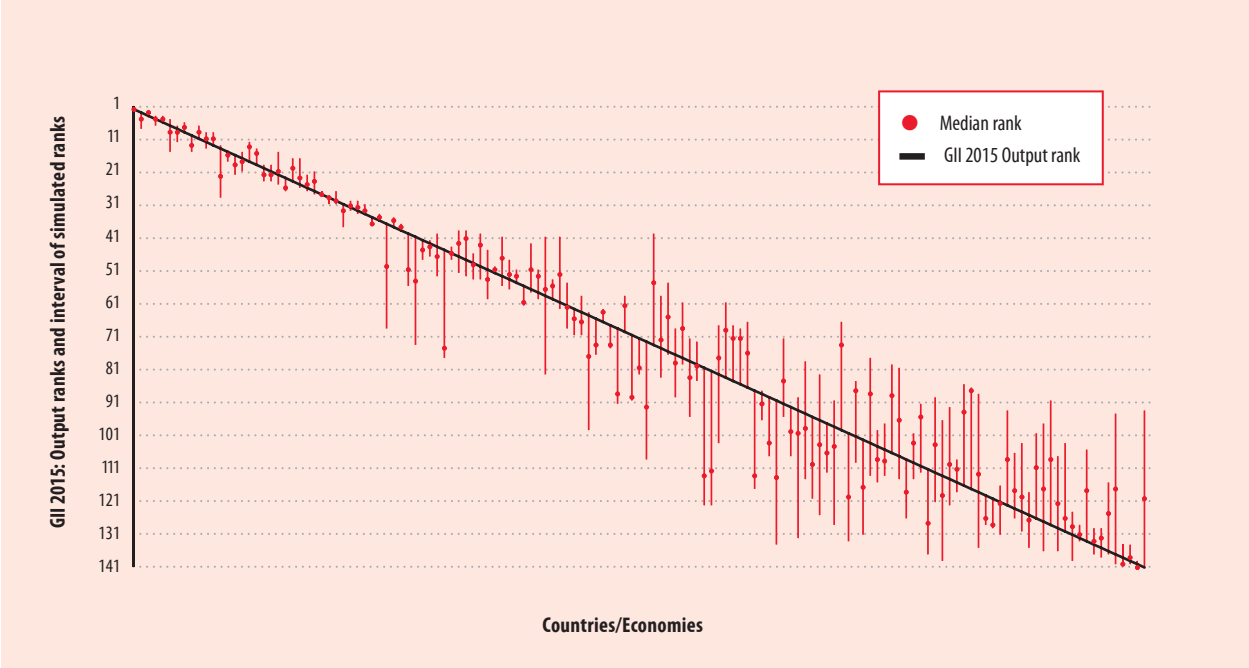
Figure 2b: Robustness analysis (Input rank vs. median rank, 90% confidence intervals)



Source: Saisana and Domínguez-Torreiro, European Commission Joint Research Centre, 2015.

Notes: Median ranks and intervals are calculated over 4,000 simulated scenarios combining random weights, imputed versus missing values, and geometric versus arithmetic average at the pillar level. The Spearman rank correlation between the median rank and the Innovation Input 2015 rank is 0.983.

Figure 2c: Robustness analysis (Output rank vs. median rank, 90% confidence intervals)



Source: Saisana and Domínguez-Torreiro, European Commission Joint Research Centre, 2015.

Notes: Median ranks and intervals are calculated over 4,000 simulated scenarios combining random weights, imputation versus no imputation of missing values, and geometric versus arithmetic average at the pillar level. The Spearman rank correlation between the median rank and the Innovation Output 2015 rank is 0.966.

the median rank as the yardstick for an economy's expected rank in the realm of the GII's unavoidable methodological uncertainties, 75% of the economies are found to shift fewer than seven positions with respect to the median rank in the GII (seven and eleven positions in the Input and Output Sub-Index, respectively).

For full transparency and information, Table 4 reports the GII 2015 Index and Input and Output Sub-Indices economy ranks together with the simulated 90% confidence intervals in order to better appreciate the robustness of the results to the choice of weights, of the aggregation formula and the impact of estimating missing data (where applicable).

Sensitivity analysis results

Complementary to the uncertainty analysis, sensitivity analysis has been used to identify which of the modelling assumptions have the highest impact on certain country ranks. Table 5 summarizes the impact of one-at-a-time changes of either the EM imputation method or the geometric aggregation formula, with random weights. The most influential assumption is the choice of no imputation versus EM imputation; this is particularly influential for the Output Sub-Index, then for the GII, and least for the Input Sub-Index. This sensitivity is the result of the data availability, which is less satisfactory in the case of the Output Sub-Index: 29 countries have data coverage well below the 60% threshold over the 27 variables in the Output Sub-Index. Instead, data coverage is satisfactory in the case of the Input Sub-Index (all economies have indicator coverage more than 65% over the 52 variables). This factor has affected the uncertainty analysis as well, and has propagated from the Output Sub-Index to the estimation of the overall GII. The choice of the aggregation formula has a very limited impact on the economies' ranks.

Our recommendation would be to consider country ranks in the GII 2015 and in the Input and Output Sub-Indexes not only at face value but also within the 90% confidence intervals in order to better appreciate to what degree a country's rank depends on the modelling choices. Furthermore, the 60% indicator coverage threshold needs to be applied separately to the Input and the Output Sub-Indices.

Table 4: GII 2015 and Input/Output Sub-Indices: Ranks and 90% confidence intervals

	GII 2015		Input Sub-Index		Output Sub-Index	
Country/Economy	Rank	Interval	Rank	Interval	Rank	Interval
Switzerland	1	[1, 1]	2	[2, 5]	1	[1, 1]
United Kingdom	2	[2, 3]	6	[1, 6]	5	[3, 5]
Sweden	3	[2, 4]	7	[2, 8]	4	[3, 6]
Netherlands	4	[3, 5]	11	[7, 13]	3	[2, 3]
United States of America	5	[5, 10]	5	[4, 8]	9	[9, 14]
Finland	6	[4, 6]	3	[1, 6]	10	[6, 10]
Singapore	7	[6, 13]	1	[1, 8]	20	[18, 23]
Ireland	8	[6, 10]	14	[7, 16]	7	[6, 11]
Luxembourg	9	[6, 13]	20	[19, 24]	2	[2, 7]
Denmark	10	[7, 12]	8	[6, 11]	12	[8, 12]
Hong Kong (China)	11	[8, 23]	4	[2, 23]	19	[18, 23]
Germany	12	[6, 13]	18	[12, 19]	8	[5, 8]
Iceland	13	[12, 22]	23	[22, 27]	6	[4, 14]
Korea, Republic of	14	[7, 14]	15	[7, 16]	11	[8, 13]
New Zealand	15	[14, 18]	13	[12, 16]	15	[15, 21]
Canada	16	[15, 25]	9	[7, 25]	22	[22, 26]
Australia	17	[12, 18]	10	[8, 12]	24	[16, 25]
Austria	18	[13, 19]	19	[16, 20]	18	[13, 18]
Japan	19	[13, 21]	12	[9, 13]	26	[20, 27]
Norway	20	[18, 22]	16	[13, 19]	25	[21, 26]
France	21	[15, 21]	17	[14, 19]	23	[16, 23]
Israel	22	[17, 23]	22	[16, 24]	16	[14, 20]
Estonia	23	[20, 23]	26	[20, 26]	14	[14, 17]
Czech Republic	24	[19, 24]	27	[25, 28]	17	[11, 17]
Belgium	25	[25, 26]	21	[20, 23]	28	[28, 30]
Malta	26	[25, 32]	33	[29, 38]	13	[12, 28]
Spain	27	[24, 28]	24	[19, 25]	29	[26, 30]
Slovenia	28	[27, 29]	30	[27, 31]	27	[26, 27]
China	29	[27, 32]	41	[33, 48]	21	[14, 24]
Portugal	30	[28, 31]	28	[26, 32]	33	[30, 33]
Italy	31	[28, 31]	29	[27, 32]	32	[29, 33]
Malaysia	32	[30, 33]	31	[25, 32]	34	[34, 36]
Latvia	33	[32, 34]	34	[31, 37]	30	[30, 37]
Cyprus	34	[34, 43]	32	[31, 38]	43	[39, 52]
Hungary	35	[33, 35]	42	[34, 42]	37	[34, 37]
Slovakia	36	[35, 37]	37	[37, 43]	38	[36, 38]
Barbados	37	[36, 69]	46	[39, 73]	36	[36, 68]
Lithuania	38	[37, 39]	35	[31, 36]	42	[41, 46]
Bulgaria	39	[35, 39]	49	[42, 49]	35	[33, 35]
Croatia	40	[40, 44]	43	[40, 46]	41	[41, 47]
Montenegro	41	[41, 71]	50	[50, 75]	40	[40, 73]
Chile	42	[38, 42]	36	[32, 40]	48	[45, 53]
Saudi Arabia	43	[43, 67]	45	[43, 58]	44	[44, 77]
Moldova, Republic of	44	[39, 45]	74	[65, 74]	31	[29, 32]
Greece	45	[41, 49]	38	[33, 43]	57	[50, 59]
Poland	46	[37, 46]	39	[35, 41]	56	[42, 57]
United Arab Emirates	47	[39, 60]	25	[25, 46]	99	[66, 99]
Russian Federation	48	[41, 51]	52	[40, 55]	49	[39, 53]
Mauritius	49	[40, 60]	44	[39, 60]	60	[40, 62]
Qatar	50	[50, 60]	40	[36, 49]	62	[62, 70]
Costa Rica	51	[46, 52]	61	[48, 64]	45	[43, 47]
Viet Nam	52	[52, 67]	78	[75, 87]	39	[39, 55]
Belarus	53	[46, 78]	55	[50, 79]	58	[40, 82]
Romania	54	[47, 55]	57	[48, 57]	52	[40, 55]
Thailand	55	[49, 58]	62	[47, 62]	50	[44, 59]
TFYR Macedonia	56	[56, 66]	56	[56, 74]	55	[55, 61]
Mexico	57	[50, 57]	58	[50, 61]	54	[50, 54]
Turkey	58	[49, 59]	71	[54, 71]	46	[38, 51]
Bahrain	59	[59, 69]	48	[45, 73]	65	[65, 76]
South Africa	60	[53, 62]	54	[44, 56]	61	[54, 68]
Armenia	61	[53, 61]	69	[58, 74]	51	[49, 51]
Panama	62	[56, 62]	72	[58, 72]	53	[47, 56]
Serbia	63	[54, 63]	70	[54, 70]	59	[53, 59]
Ukraine	64	[47, 66]	84	[59, 84]	47	[38, 52]
Seychelles	65	[65, 80]	59	[59, 101]	64	[63, 99]
Mongolia	66	[43, 66]	53	[45, 53]	73	[39, 73]
Colombia	67	[49, 67]	51	[43, 53]	75	[54, 76]
Uruguay	68	[59, 68]	63	[52, 63]	66	[62, 66]
Oman	69	[69, 78]	68	[55, 77]	68	[68, 91]
Brazil	70	[54, 72]	65	[51, 68]	74	[58, 83]
Peru	71	[65, 80]	60	[58, 71]	82	[67, 103]

Table 4: GII 2015 and Input/Output Sub-Indices: Ranks and 90% confidence intervals *(continued)*

	GII 2015		Input Sub-Index		Output Sub-Index	
Country/Economy	Rank	Interval	Rank	Interval	Rank	Interval
Argentina	72	[60, 76]	81	[57, 85]	63	[58, 70]
Georgia	73	[65, 73]	67	[58, 77]	86	[66, 86]
Lebanon	74	[72, 82]	77	[65, 83]	76	[68, 89]
Jordan	75	[68, 76]	80	[60, 83]	67	[67, 74]
Tunisia	76	[76, 81]	83	[66, 87]	71	[71, 82]
Kuwait	77	[77, 87]	87	[74, 100]	70	[70, 90]
Morocco	78	[69, 78]	76	[63, 77]	84	[67, 84]
Bosnia and Herzegovina	79	[79, 100]	47	[47, 100]	122	[93, 122]
Trinidad and Tobago	80	[80, 90]	86	[83, 94]	88	[87, 96]
India	81	[73, 81]	100	[84, 100]	69	[58, 69]
Kazakhstan	82	[77, 87]	75	[63, 75]	107	[80, 114]
Philippines	83	[76, 86]	101	[84, 101]	77	[60, 79]
Senegal	84	[84, 107]	110	[101, 111]	72	[72, 108]
Sri Lanka	85	[76, 98]	104	[79, 114]	79	[72, 84]
Guyana	86	[86, 110]	90	[90, 121]	93	[89, 132]
Albania	87	[87, 95]	73	[72, 84]	112	[89, 121]
Paraguay	88	[73, 88]	103	[90, 103]	83	[60, 83]
Dominican Republic	89	[89, 107]	88	[87, 98]	98	[90, 128]
Botswana	90	[85, 110]	79	[72, 82]	108	[108, 126]
Cambodia	91	[84, 102]	96	[96, 113]	91	[71, 95]
Kenya	92	[79, 103]	113	[93, 113]	78	[71, 95]
Azerbaijan	93	[82, 102]	89	[85, 101]	103	[77, 113]
Rwanda	94	[81, 103]	66	[66, 86]	128	[90, 128]
Mozambique	95	[94, 104]	93	[80, 109]	97	[97, 112]
Jamaica	96	[96, 96]	85	[80, 91]	110	[91, 112]
Indonesia	97	[73, 97]	114	[80, 114]	85	[68, 85]
Malawi	98	[98, 117]	111	[111, 125]	89	[89, 107]
El Salvador	99	[92, 100]	95	[80, 95]	104	[99, 115]
Egypt	100	[85, 118]	108	[92, 115]	96	[82, 125]
Guatemala	101	[88, 108]	107	[94, 114]	101	[84, 109]
Burkina Faso	102	[102, 130]	109	[107, 124]	100	[100, 133]
Cabo Verde	103	[93, 121]	92	[92, 117]	114	[92, 122]
Bolivia, Plurinational State of	104	[95, 118]	118	[101, 128]	92	[92, 107]
Mali	105	[105, 128]	125	[119, 127]	81	[81, 122]
Iran, Islamic Republic of	106	[93, 108]	106	[86, 113]	105	[97, 113]
Namibia	107	[98, 116]	91	[76, 106]	119	[119, 128]
Ghana	108	[96, 124]	116	[91, 118]	102	[102, 131]
Kyrgyzstan	109	[84, 118]	94	[76, 99]	118	[88, 135]
Cameroon	110	[110, 131]	126	[119, 129]	90	[90, 134]
Uganda	111	[95, 125]	102	[92, 118]	113	[96, 139]
Gambia	112	[107, 128]	121	[121, 136]	94	[78, 114]
Honduras	113	[90, 113]	105	[94, 115]	116	[85, 116]
Tajikistan	114	[90, 114]	115	[101, 121]	106	[79, 106]
Fiji	115	[79, 125]	64	[64, 105]	137	[94, 140]
Côte d'Ivoire	116	[115, 132]	131	[127, 132]	87	[87, 117]
Tanzania, United Republic of	117	[110, 118]	124	[109, 128]	95	[95, 120]
Lesotho	118	[106, 129]	97	[95, 113]	125	[118, 135]
Ecuador	119	[98, 123]	99	[91, 107]	124	[103, 130]
Angola	120	[120, 130]	137	[133, 139]	80	[80, 122]
Bhutan	121	[98, 138]	82	[81, 106]	135	[129, 138]
Uzbekistan	122	[107, 138]	112	[112, 136]	127	[97, 136]
Swaziland	123	[111, 130]	98	[93, 119]	132	[128, 133]
Zambia	124	[115, 124]	130	[116, 139]	115	[108, 118]
Madagascar	125	[113, 135]	123	[117, 134]	123	[106, 126]
Algeria	126	[105, 130]	119	[108, 123]	129	[107, 136]
Ethiopia	127	[118, 140]	132	[120, 141]	111	[111, 137]
Nigeria	128	[118, 134]	135	[130, 138]	109	[100, 114]
Bangladesh	129	[105, 129]	129	[103, 129]	126	[100, 126]
Nicaragua	130	[105, 130]	120	[106, 132]	133	[105, 133]
Pakistan	131	[104, 131]	136	[124, 136]	117	[86, 117]
Venezuela, Bolivarian Republic of	132	[119, 138]	133	[120, 140]	121	[116, 131]
Zimbabwe	133	[131, 140]	134	[129, 141]	120	[120, 129]
Niger	134	[122, 139]	117	[106, 133]	139	[134, 140]
Nepal	135	[121, 137]	127	[118, 129]	136	[115, 137]
Burundi	136	[134, 138]	122	[116, 133]	138	[134, 140]
Yemen	137	[130, 140]	138	[133, 139]	131	[124, 139]
Myanmar	138	[130, 138]	139	[129, 139]	130	[103, 130]
Guinea	139	[135, 140]	140	[132, 141]	134	[129, 137]
Togo	140	[117, 141]	128	[127, 137]	141	[93, 141]
Sudan	141	[140, 141]	141	[138, 141]	140	[139, 141]

Source: Saisana and Domínguez-Torreiro, European Commission Joint Research Centre, 2015.

Table 5: Sensitivity analysis: Impact of modelling choices on economies with most sensitive ranks

Index or Sub-Index	Uncertainty tested (pillar level only)	Number of economies that *improve* by 20 or more positions	Number of economies that *deteriorate* by 20 or more positions
GII	Geometric vs. arithmetic average	0	1
	EM imputation vs. no imputation of missing data	8	2
	Geometric average and EM imputation vs. arithmetic average and missing values	8	4
Input Sub-Index	Geometric vs. arithmetic average	1	1
	EM imputation vs. no imputation of missing data	1	1
	Geometric average and EM imputation vs. arithmetic average and missing values	1	1
Output Sub-Index	Geometric vs. arithmetic average	2	1
	EM imputation vs. no imputation of missing data	15	18
	Geometric average and EM imputation vs. arithmetic average and missing values	15	18

Source: Saisana and Domínguez-Torreiro, European Commission Joint Research Centre, 2015.

Conclusion

The JRC analysis suggests that the conceptualized multi-level structure of the GII 2015—with its 21 sub-pillars, 7 pillars, 2 sub-indices, up to an overall index—is statistically sound and balanced: that is, each sub-pillar makes a similar contribution to the variation of its respective pillar. The no-imputation choice for not treating missing values, common in relevant contexts and justified on grounds of transparency and replicability, can at times have an undesirable impact on some country scores for the Innovation Output Sub-Index in particular, with the additional negative side-effect that it may encourage countries not to report low data values. The choice of the GII team this year to use weights as scaling coefficients during the development of the index (the same choice that has been made since 2012) constitutes a significant departure from the traditional vision of weights as a reflection of indicators' importance in a weighted average. It is hoped that such a consideration will be made also by other developers of composite indicators.

The strong correlations between the GII components are proven not to be a sign of redundancy of information in the GII. For more than 50.4% (up to 69.5%) of the 141 economies included in the GII 2015, the GII ranking and the rankings of any of the seven pillars differ by 10 positions or more. This demonstrates the added value of the GII ranking, which helps to highlight other components of innovation that do not emerge directly by looking into the seven pillars separately.

All published GII 2015 ranks lay within the simulated 90% confidence intervals that take into account the unavoidable uncertainties in the estimation of missing data, the weights (fixed vs. random), and the aggregation formula (arithmetic vs. geometric average) at the pillar level. For most countries these intervals are narrow enough for meaningful inferences to be drawn: the intervals comprise fewer than 10 positions for 80 of the 141 economies. Caution is needed for some countries with ranks that are highly sensitive to the methodological choices. The Output Sub-Index is more sensitive to the methodological choices; sensitivity is mostly the consequence of the estimation of missing data and the fact that there are only two pillars; hence changes to the imputation method, weights, or aggregation formula have a more notable impact on the country ranks. Nevertheless, country ranks, either in the GII 2015 or in the two sub-indexes, can be considered representative of the many possible scenarios: 75% of the countries shift fewer than seven positions with respect to the median rank in the GII (seven and eleven positions, respectively, in the Input and Output Sub-Indices).

All things considered, the present JRC audit endorses the statistical soundness and reliability of the GII index as a benchmarking tool for innovation practices at the country level around the world. Needless to say, the usefulness of the GII index as a standalone policy evaluation tool should be enhanced by simultaneously reading and reflecting on the wealth of information on innovation issues gathered and disseminated within the overall GII framework, which in any case should be regarded as a sound attempt to pave the way for better and more informed innovation policies worldwide.

Notes

1 OECD/EC JRC, 2008, p. 26.

2 The JRC analysis was based on the recommendations of the OECD/EC JRC (2008) *Handbook on Composite Indicators* and on more recent research from the JRC. The JRC audits on composite indicators are conducted upon request of the index developers and are available at https://ec.europa.eu/jrc/en/coin.

3 Groeneveld and Meeden (1984) set the criteria for absolute skewness above 1 and kurtosis above 3.5. The skewness criterion was relaxed to account for the small sample (141 economies).

4 Nunnally, 1978.

5 Saisana et al., 2005; Saisana et al., 2011.

6 The Expectation-Maximization (EM) algorithm (Little and Rubin, 2002) is an iterative procedure that finds the maximum likelihood estimates of the parameter vector by repeating two steps: (1) The expectation E-step: Given a set of parameter estimates, such as a mean vector and covariance matrix for a multivariate normal distribution, the E-step calculates the conditional expectation of the complete-data log likelihood given the observed data and the parameter estimates. (2) The maximization M-step: Given a complete-data log likelihood, the M-step finds the parameter estimates to maximize the complete-data log likelihood from the E-step. The two steps are iterated until the iterations converge.

7 Munda, 2008.

8 In the geometric average, pillars are multiplied as opposed to summed in the arithmetic average. Pillar weights appear as exponents in the multiplication. All pillar scores were greater than zero, hence there was no reason to rescale them to avoid zero values that would have led to zero geometric averages.

References

Groeneveld, R. A. and G. Meeden. 1984. 'Measuring Skewness and Kurtosis'. *The Statistician* 33: 391–99.

Little, R. J. A. and D. B. Rubin. 2002. *Statistical Analysis with Missing Data.* 2nd edition. Hoboken, NJ: John Wiley & Sons, Inc.

Munda, G. 2008. *Social Multi-Criteria Evaluation for a Sustainable Economy*. Berlin Heidelberg: Springer-Verlag.

Nunnally, J. 1978. *Psychometric Theory*. New York: McGraw-Hill.

OECD/EC JRC (Organisation for Economic Co-operation and Development/European Commission, Joint Research Centre). 2008. *Handbook on Constructing Composite Indicators: Methodology and User Guide.* Paris: OECD.

Paruolo, P., M. Saisana, and A. Saltelli. 2013. 'Ratings and Rankings: Voodoo or Science?' *Journal of the Royal Statistical Society* A 176 (3): 609–34.

Saisana, M., B. D'Hombres, and A. Saltelli. 2011. 'Rickety Numbers: Volatility of University Rankings and Policy Implications'. *Research Policy* 40: 165–77.

Saisana, M., A. Saltelli, and S. Tarantola. 2005. 'Uncertainty and Sensitivity Analysis Techniques as Tools for the Analysis and Validation of Composite Indicators'. *Journal of the Royal Statistical Society* A 168 (2): 307–23.

Saltelli, A., M. Ratto, T. Andres, F. Campolongo, J. Cariboni, D. Gatelli, M., Saisana, and S. Tarantola. 2008. *Global Sensitivity Analysis: The Primer.* Chichester, England: John Wiley & Sons.

Benchmarking Innovation Outperformance at the Global and Country Levels

Rafael Escalona Reynoso and **Alexandra L. Bernard,** Cornell University

Michaela Saisana, European Commission, Joint Research Centre (JRC) - Econometrics and Applied Statistics

Martin Schaaper, UNESCO Institute for Statistics (UIS)

Sacha Wunsch-Vincent and **Francesca Guadagno,** WIPO

National innovation policies and programmes are flourishing. Especially in developing countries, the emphasis on fostering innovation has now also increased. At the global level, the need to spur innovation to foster economic growth and to find solutions to social challenges is increasingly recognized.

Accordingly, benchmarking innovation performance is becoming a greater priority. Taking advantage of the wealth of information produced by the Global Innovation Index (GII) over the last years, this chapter compares the innovation performance of specific countries, identifies developing nations that persistently outperform their peers on innovation performance, and analyses how their local efforts have improved their capacity to innovate. This will help other countries look ahead to policy changes they might want to implement themselves.

The chapter first discusses why measuring innovation is important. It then identifies those developing countries that performed persistently above their peers.[1] This is followed by a discussion of innovation achievers—those with scores in the overall GII that are higher than expected for their level of development—and a consideration of their strengths and weaknesses. This is followed by a look at pillar outperformer countries—those that perform above their income-group peers in more than half the pillars of the GII. The next section examines the 11 innovation outperformers this year—these are countries that have attained both innovation achiever and pillar outperformer status—and takes a look at their policy strategies. Finally, the chapter zeros in on the role that education and research systems play for the innovation outperformers. The conclusions that end the chapter note characteristics common to the persistent outperforming countries.

The importance of measuring innovation performance

Measuring progress in innovation has become essential for policy makers seeking ways to assess the effectiveness of their innovation systems and polices. Interest in innovation measurement has even permeated high-level international development-related discussions. At the global level, the United Nations (UN) Sustainable Development Goals (SDGs), for instance, will set a new development agenda (see Box 1). Innovation has a large role to play in this agenda, both as a means to achieve improvements in health, environmental protection, food security, and so on, and as a goal in itself. The identification of cross-cutting indicators that can capture innovation progress is thus an ongoing process in the respective UN fora as well.

As discussed in Chapter 1, innovation needs to be understood broadly and also to be recognized as the result of complex interactions among various actors, such as firms, education and research organizations, and the public sector. Successful innovation also must incorporate the coevolution of institutions and regulations as well as science, technology, and innovation policies. To produce a comprehensive measure for benchmarking innovation performance, it is necessary to go beyond readily available one-dimensional statistics such as research and development (R&D) expenditure and the number of patents.

Identifying developing countries with persistently high innovation performance

By comparing respective innovation performances and identifying those developing countries that outperform others at similar levels of economic development, the GII can help identify areas of strengths and weaknesses in innovation efforts and point to priority areas for improvement.

To recap, the GII traditionally relies on two sub-indices: the Innovation Input Sub-Index and the Innovation Output Sub-Index, which have a total of seven pillars between them. Five innovation inputs are used to build the Innovation Input Sub-Index. These capture the characteristics of the enabling environment for innovation and include: (1) Institutions, (2) Human capital and research, (3) Infrastructure,

Box 1: The Post 2015 Development Agenda: From Millennium Development Goals to Sustainable Development Goals

In September 2015, the Member States of the United Nations (UN) are expected to agree on the various elements that make up the Post 2015 Development Agenda. Central to this agreement will be the adoption of the Sustainable Development Goals (SDGs), which are intended to build on the Millennium Development Goals (MDGs) and will provide the main basis for a comprehensive set of targets that will shape development in the period 2015–30.

The Post 2015 Development Agenda calls for a transformative shift to a low carbon and socially equitable economy that balances economic progress with safeguarding tvhe environment. In a shift from the approach of the MDGs, which focused on developing countries, the SDGs will be universal in their application and implementation.

It is ever more recognized, especially within the UN, that innovation is key for this purpose. The development and transfer of technologies requires an enabling environment: a national innovation system that promotes the development of domestic technological solutions as well as north-south, south-south, and triangular technology transfer and cooperation. Countries able to build and nurture effective national innovation systems are best able to harness technologies—both old and new.

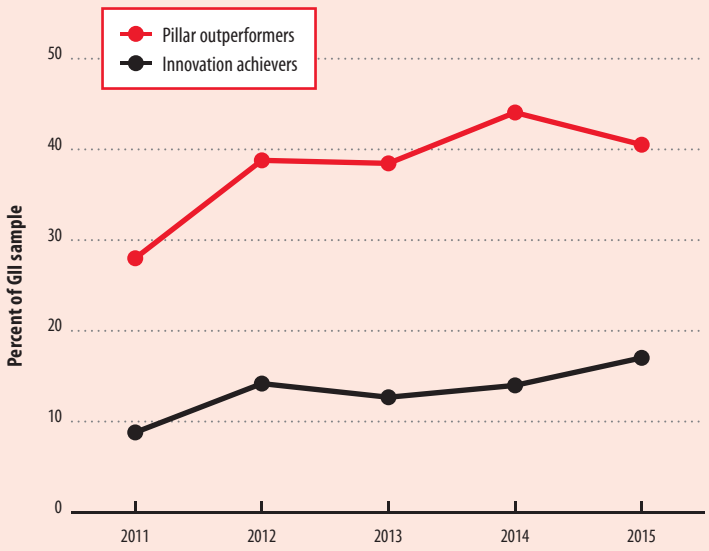
However, as the Global Innovation Index (GII) demonstrates, such systems are highly complex and interactive. Policy makers require evidence to support effective decision making in building such systems. Data are important for monitoring, reviewing, and accountability in terms of SDG progress; they are of even greater significance in guiding policy makers to make the right decisions at the national level. The SDGs will establish 17 Goals with 169 targets. This will provide the framework for monitoring, review, and accountability at the global, regional, and national levels. Technology and innovation as a cross-cutting issue feeds into several of these goals and targets. Goal 9, in particular—'Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation'—makes explicit reference to innovation and refers to several elements that compose the GII, namely infrastructures, access to credit, market access, resource efficiency and environmentally friendly technologies, access to ICT, scientific research, and technological capabilities.

As the indicator framework for the SDGs is developed over the coming months, the GII can provide an important contribution and the critical data required to monitor innovation.

Source

UNDESA, 2015.

Figure 1: Percentage of economies outperforming at the GII score and pillar level, 2011–14



Note: Innovation achievers are those with GII levels higher than expected based on their level of economic development. Pillar outperformers are those performing above their income group in four or more pillars.

(4) Market sophistication, and (5) Business sophistication. Two innovation outputs compose the Innovation Output Sub-Index: (6) Knowledge and technology outputs and (7) Creative outputs.

This chapter benchmarks national innovation performance by taking into account both the overall GII scores and those of the seven individual GII pillars. Countries are termed 'innovation achievers' and said to outperform their peers if their GII scores are higher than expected based on their level of economic development (as measured by GDP per capita) (see Box 2). Countries also have the opportunity to be 'pillar outperformers' if they outperform their peers on more than half of the seven GII pillars. Countries that meet both of these benchmarks are hereto referred to as 'innovation outperformers'. These

Table 1: Innovation achievers and pillar outperformers, 2011–14

Economy	Income group	Region	Years as an innovation achiever (total)	Years as a pillar outperformer (total)
Armenia	Lower-middle income	NAWA	2014, 2013, 2012 (3)	2014, 2013, 2012 (3)
Burkina Faso	Low income	SSF	2014 (1)	2014, 2013, 2012 (3)
China	Upper-middle income	SEAO	2014, 2013, 2012, 2011 (4)	2014, 2013, 2012, 2011 (4)
Costa Rica	Upper-middle income	LCN	2013 (1)	2014, 2013, 2012, 2011 (4)
Czech Republic	High income	EUR	2014 (1)	2014 (1)
Georgia	Lower-middle income	NAWA	2014, 2013, 2012 (3)	2014, 2013, 2012, 2011 (4)
Ghana*	Lower-middle income	SSF	2011 (1)	2014, 2013, 2012, 2011 (4)
Gambia	Low income	SSF	2014 (1)	2014 (1)
Guyana	Lower-middle income	LCN	2011 (1)	2013, 2012, 2011 (3)
Hungary†	Upper-middle income	EUR	2013, 2012 (2)	2014, 2013, 2012, 2011 (4)
India	Lower-middle income	CSA	2014, 2013, 2012, 2011 (4)	2014, 2013, 2012, 2011 (4)
Jordan	Upper-middle income	NAWA	2014, 2013, 2012, 2011 (4)	2014, 2013, 2011 (3)
Kenya	Low income	SSF	2014, 2013, 2012, 2011 (4)	2014, 2013, 2012, 2011 (4)
Moldova, Rep.	Lower-middle income	EUR	2014, 2013, 2012, 2011 (4)	2014, 2013, 2012, 2011 (4)
Mali	Low income	SSF	2013 (1)	2013, 2012 (2)
Montenegro	Upper-middle income	EUR	2013, 2012 (2)	2014, 2013, 2012 (3)
Mongolia	Lower-middle income	SEAO	2014, 2013, 2012, 2011 (4)	2014, 2013, 2012, 2011 (4)
Mozambique	Low income	SSF	2014, 2012 (2)	2014, 2013, 2012 (3)
Malawi	Low income	SSF	2014, 2012 (2)	2014, 2012, 2011 (3)
Malaysia	Upper-middle income	SEAO	2014, 2013, 2012, 2011 (4)	2014, 2013, 2012, 2011 (4)
Rwanda	Low income	SSF	2014, 2012 (2)	2014, 2013, 2012, 2011 (4)
Serbia	Upper-middle income	EUR	2012 (1)	2014, 2013, 2012, 2011 (4)
Thailand	Upper-middle income	SEAO	2014, 2011 (2)	2014, 2013, 2012, 2011 (4)
Tajikistan	Low income	CSA	2013 (1)	2013, 2012 (2)
Uganda	Low income	SSF	2014, 2013 (2)	2014, 2013 (2)
Ukraine	Lower-middle income	EUR	2014, 2012 (2)	2014, 2013, 2012, 2011 (4)
Viet Nam	Lower-middle income	SEAO	2014, 2013, 2012, 2011 (4)	2014, 2013, 2012, 2011 (4)
Zimbabwe	Low income	SSF	2012 (1)	2014, 2013, 2012 (3)

Note: Regions are based on the United Nations Classification: EUR = Europe; NAC = Northern America; LCN = Latin America and the Caribbean; CSA = Central and Southern Asia; SEAO = South East Asia and Oceania; NAWA = Northern Africa and Western Asia; SSF = Sub-Saharan Africa. * Low income in 2011, lower-middle income in all other years. † Upper-middle income in 2014, high income in all previous years.

outperformers provide the basis of the following analysis.

This approach has some limitations. As with most year-on-year comparisons, movements in and out of the outperformer group can be the result of methodological changes in the GII framework, newly available data, and relative numerator versus denominator changes that do not necessarily correspond to improved or worsened innovation performance (refer to Chapter 1 Annex 2).

With these caveats in mind, this chapter looks into the performance of those countries that do well on either or both these criteria.

This analysis finds that the percentage of countries with above-par performance as defined above exhibits an upward trend (Figure 1). The number of innovation achievers continues to increase through the period under study here, namely 2011–14, and beyond into 2015: This year it reached 24 economies, or 17% of the economies included in the GII sample. This is the highest percentage since 2011, when it reached 9%. The number of pillar outperformers reached 41% in 2015, up from 28% in 2011. An increasing number of countries are thus doing strictly better on innovation than their development levels would suggest. No inference can be made from these data about whether the absolute level of innovation performance globally has increased. Instead, these countries are able to detach themselves from their peer group, leading to a more unequal distribution of innovation performance, at least until their income levels increase to such an extent that they will need to compare themselves with more-advanced country peers.

As Table 1 shows, eight economies (China, India, Jordan, Kenya, the Republic of Moldova, Mongolia, Malaysia, and Viet Nam), signalled

Box 2: How innovation performance relative to GDP is identified and classified

Since 2012 the process of determining a country's innovation status has relied on both its Global Innovation Index (GII) score and its level of economic development, as measured by gross domestic product (GDP) per capita. Once the GII scores for each country are determined, these are contrasted with their current year's GDP based on per capita purchasing power parity (GDP PC PPP$).[1] To facilitate the comparison between GDP per capita and GII scores (on a scale of 0–100), and given that GDP per capita in PPP$ (ln scale) for each country follows a log-normal distribution, the latter are transformed using natural logarithms. The GII scores (Y axis) for all countries are then plotted against their GDP per capita (X axis).[2] The plotted data points for all countries help define a trend line—a polynomial regression of the form $y = f(x)$—and its equation, which models the relationship between these variables. Using the equation that defines this trend line, the expected GII score for each country can be calculated (the dependent variable), given its degree of economic development as measured by GDP per capita (the independent variable).[3] These expected scores help define the range within which a country's score is perceived as performing in line with its level of economic development.

For each country, the upper bound in this range is determined by increasing its expected score by 10%; the lower bound is determined by decreasing its expected score by 10%. A country is considered to be an 'innovation achiever' if its GII score falls above its upper bound. When a country's GII score falls within bounds it is considered to be performing as expected for its level of development; when a country's GII score falls below the lower bound it is considered to be performing below its level of development. Figure 2.1 shows a close-up of the trend line and bounds for the GII 2015 as well as the data points for three economies: Montenegro (GII 41), an innovation achiever; Costa Rica (GII 51) performing in line with its economic development; and the Islamic Republic of Iran (GII 106), performing below its level of development.

In addition to the above, other conditions help to determine each economy's status with respect to innovation capacity. Table 2.1 summarizes the complete set of conditions. This process locates all innovation achievers above the defined trend line, while those economies identified as innovating below capacity are located below it.

Figure 2.2 shows the distribution of all countries in the GII 2015 once their scores are plotted versus the natural logarithm of their current GDP per capita. The figure also shows the trend line, which defines the relationship between the independent variable (GDP per capita) and the dependent variable (GII score). The trend line's equation and the coefficient of determination (R^2), which indicates how well it explains the relationship between these two variables, are also displayed in the figure.

Innovation achievers (shown in red) are identified as performing above their level of economic development and thus are always located above the trend line. Economies performing at levels expected for their economic development (shown in black) are located above, on, or below the trend line. Their distribution is, however, constrained by the bounds set by their expected scores: 10% plus or minus these scores as defined by the trend line's equation. Nations whose innovation performance is noted as being below their level of economic development (shown in grey), are located below the trend line.

Table 2.1: Rules for determining innovation performance with respect to GDP

Status	GII score	Difference between GII score and 10% above trend line (x = ln GDP per capita)(x = LN GDP per capita)	Difference between GII score and 10% below trend line (x = ln GDP per capita)
Innovation achievers	< 50†	> 0*	> 0
Innovators at development	< 50†	< 0	> 0
Innovators below development	< 50†	< 0	< 0*

Note: * A necessary condition; † Not a necessary condition. In some cases, economies with a GII score of 50 or more that are not among the top 25 can be considered innovation achievers.

(Continued)

as innovation achievers, outperform their peers on the overall GII score during 2011–14. By excelling in all four years, these countries demonstrate the most persistent innovation performance measured as GII score relative to their GDP. These innovation achievers are all upper- and lower-middle-income countries, with the exception of low-income Kenya.

The table also shows that 15 economies (China, Costa Rica, Georgia, Ghana, Hungary, India, Kenya, the Republic of Moldova, Mongolia, Malaysia, Rwanda, Serbia, Thailand, Ukraine, and Viet Nam) qualify as pillar outperformers—that is, they outperform their peers in at least four innovation input or output pillars for all four years during 2011–14. There is some overlap between the eight innovation achievers listed above and these

Box 2: How innovation performance relative to GDP is identified and classified

Figure 2.1: Innovation capacity of three countries: Trend line, upper and lower bounds

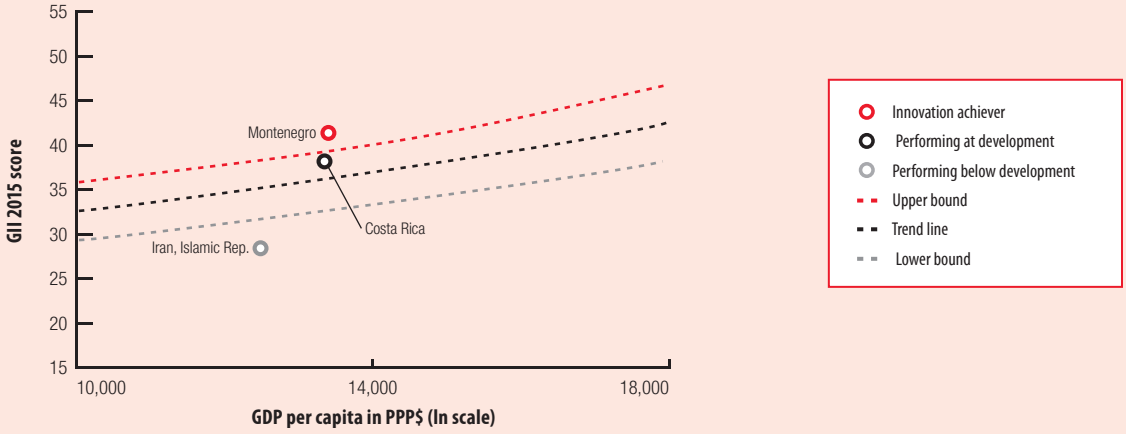
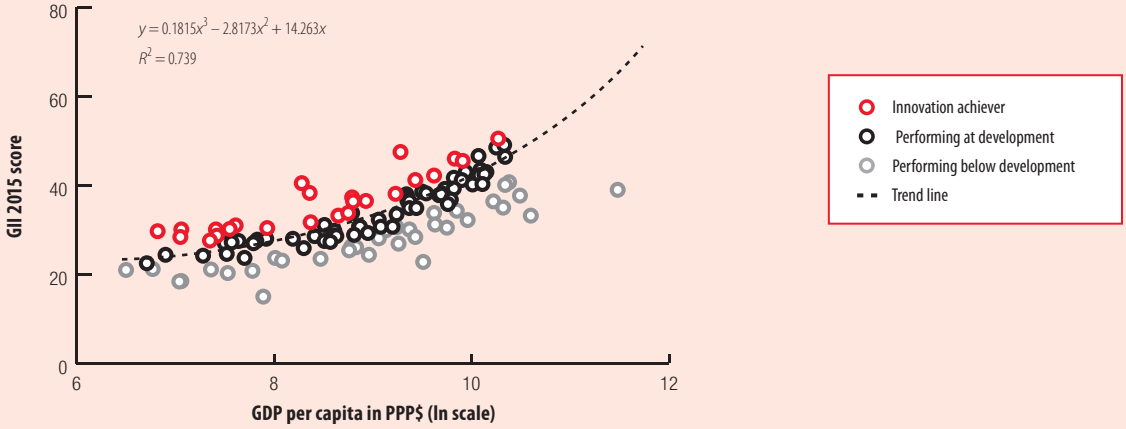


Figure 2.2 Distribution of innovation performance in the GII 2015



Notes

1 Population is also considered in this process (illustrated by the size of the data point in Figure 6 of Chapter 1). This is done to provide an additional dimension. This parameter, however, does not influence either the distribution or the resulting plotted trend line, and it is therefore not considered in Figure 2.2

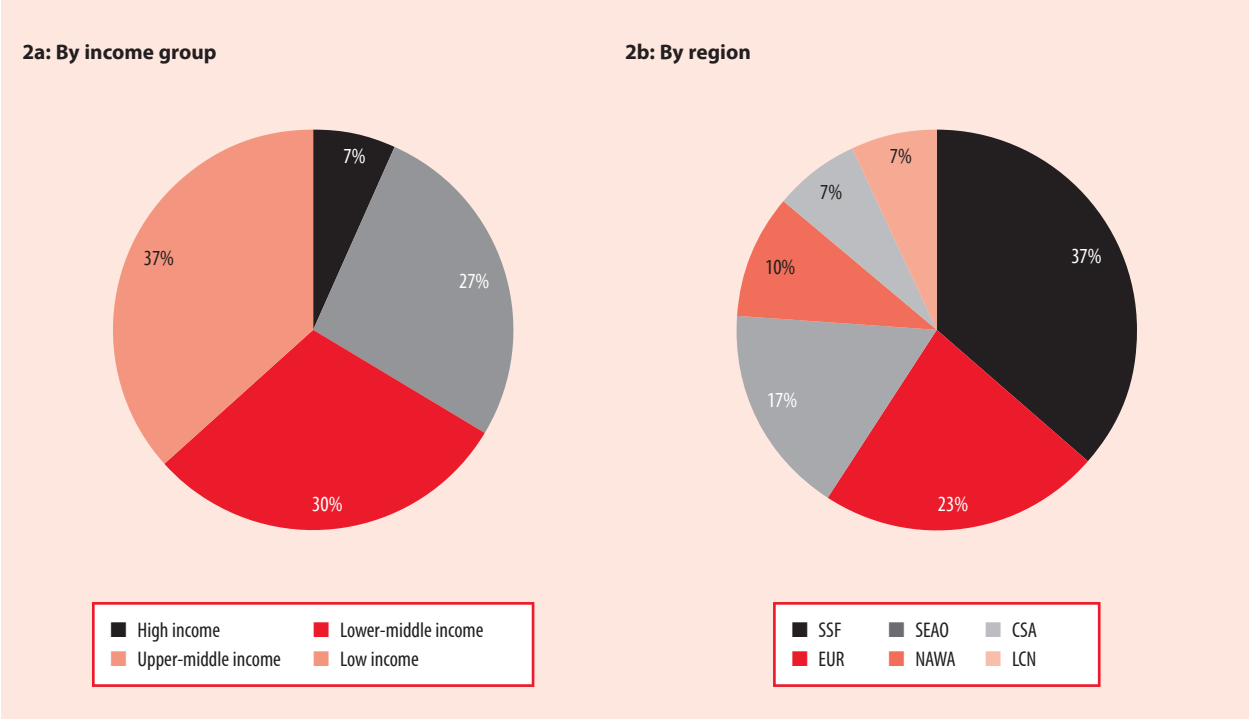
2 Each year since 2013 the trend line has been defined as a polynomial regression of degree 3 with intercept. For the year 2012, the trend line was defined as a polynomial of degree 4 without intercept, which is why it was re-calculated for this exercise.

3 The high-income economies that lead the GII rankings (see Figure 3 in Chapter 1) are not considered in Chapter 2.

pillar outperformers. The table also includes countries that qualify in either category for fewer than all four years.

Going further, 11 developing countries—Armenia, China, Georgia, India, Jordan, Kenya, Malaysia, the Republic of Moldova, Mongolia, Uganda, and Viet Nam—are labelled 'innovation outperformers' because they conform to both rules: (1) being an innovation achiever for two or more recent years (including 2013 and 2014), and (2) being a pillar outperformer for two or more years (including 2013 and 2014). Countries that outperform on one of these two criteria are discussed in the following sections.

Figure 2: Innovation achievers, 2011–14



Note: Regions are based on the United Nations Classification: CSA = Central and Southern Asia; EUR = Europe; LCN = Latin America and the Caribbean; NAWA = Northern Africa and Western Asia; SEAO = South East Asia and Oceania; SSF = Sub-Saharan Africa.

Innovation achievers by income group and region

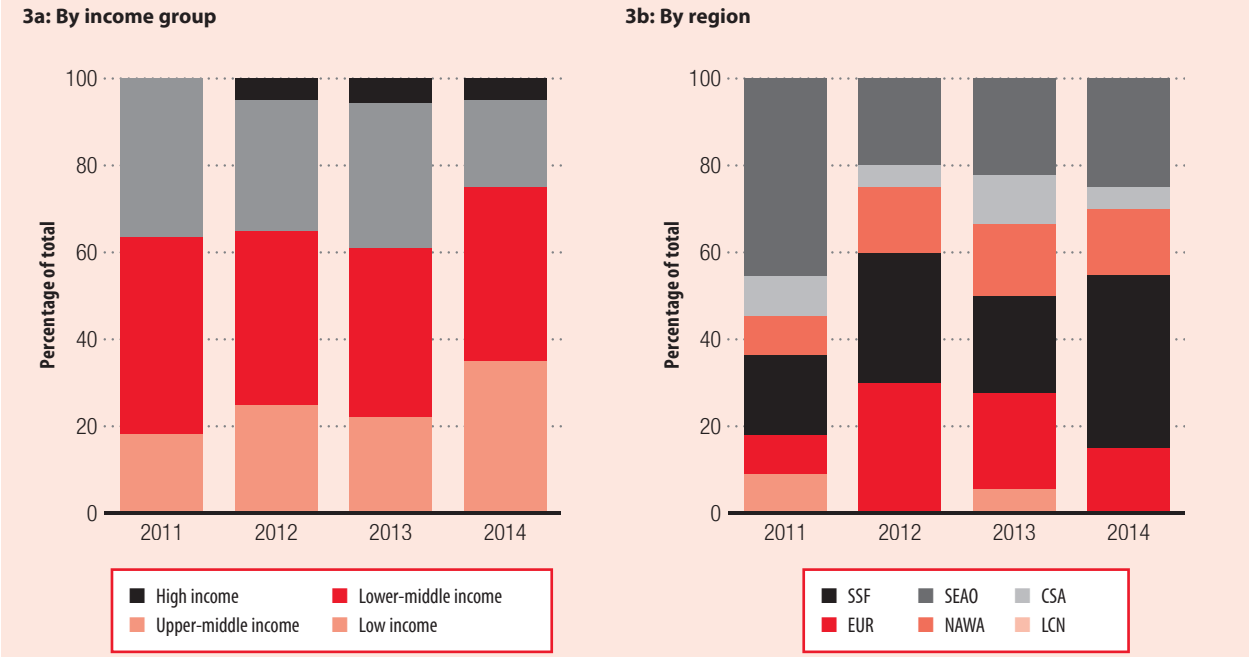
Since 2011, innovation achievers—countries that outperform in their overall GII score relative to their level of development—are mostly found in the low (11 countries), and lower-middle (9 countries) income groups. In regional terms, they are mostly from Sub-Saharan Africa (11 countries), followed by some countries in Europe (7): namely the Czech Republic, Hungary, Latvia, the Republic of Moldova, Montenegro, Ukraine, and Serbia. The European economies are all transition economies, currently implementing various strategies to improve their innovation performance and bring it closer to that of other European countries. Naturally, this suggests that producing above-par innovation capacity—that is, breaking out from the group of innovation peers—is relatively easier at lower income levels (Figures 2a and 2b).

During 2011–13 the number of innovation outperforming countries as measured by innovation achiever status among lower-income countries initially remained quite stable. However, this group increased considerably in 2014, pointing to a homogeneous innovation performance in the past but an increasing number of excelling countries more recently (Burkina Faso, Gambia, Kenya, Mozambique, Malawi, Rwanda, and Uganda) (see Figure 3a). The decrease in the percentage of upper-middle-income innovation achievers, especially from 2013 to 2014, is mainly the result of more low-income economies—particular those from Sub-Saharan Africa—attaining innovation achiever status. Indeed, the number of Sub-Saharan African innovation achievers has expanded more than other groups over recent years (see Figure 3b). Among these countries, some have consistently reached innovation achiever status (Uganda since 2013, Senegal since 2012, Kenya over the whole period). Others (e.g., Rwanda and Mozambique), however, have qualified as innovation achievers only sporadically.

Strengths and weaknesses of innovation achievers

This section identifies the GII strengths and weaknesses of innovation achievers relative to their peers in the same income group. Certain technical issues, such as consistency and availability of data, normalization, and the inclusion of new indicators bias the reliability of these results, however, and need to be kept in mind.

Figure 3: Percentage of innovation achievers, 2011–14



Note: The income group for each economy is that of the reported year. Regions are based on the United Nations Classification: CSA = Central and Southern Asia; EUR = Europe; LCN = Latin America and the Caribbean; NAWA = Northern Africa and Western Asia; SEAO = South East Asia and Oceania; SSF = Sub-Saharan Africa.

Low-income innovation achievers

Relative to the other low-income economies, innovation achievers in this group perform particularly well in the Market sophistication and Business sophistication pillars. Access to credit and innovation linkages are their areas of strongest performance. These are key inputs in the innovation process of developing countries, particularly given the financial constraints faced by their local firms and the fragmentation of their local innovation systems.

As discussed in Chapter 1, the innovation system literature puts great emphasis on the role of human capital and institutions for innovation and development. Yet these innovation input factors seem to be the most difficult of all inputs in which to achieve good scores, both in general and for low-income countries in particular. Two low-income countries that show good scores in the Institutions pillar (Burkina Faso and Malawi in 2012) score the highest in Regulatory environments and, in particular, labour market flexibilities. Only a few low-income economies outperform in Human capital and research: Kenya, Mozambique, Rwanda, Tajikistan, Uganda, Burkina Faso, Malawi, and Zimbabwe.

Lower-middle-income innovation achievers

Lower-middle-income innovation achievers also perform well in Market sophistication, thanks either to their relatively more developed financial systems (India) or to effective credit markets (e.g., Armenia, Georgia, and Mongolia). Most of these countries have their highest scores in Knowledge and technology outputs, in the form of Knowledge creation through utility models (the Republic of Moldova and Ukraine), Knowledge diffusion through communications, computer and information services exports (India), or Knowledge impact through ISO certifications (Viet Nam). Despite these heterogeneities—which often relate to the different innovation strategies adopted—this finding hints at innovation systems that are more highly developed.

Similarly, few lower-middle-income innovation achievers excel in Institutions. When they do so, their performance is driven by high scores in labour market flexibilities. Ukraine is the sole country to perform exceptionally well in Human capital and research, thanks to its performance in Tertiary education, in particular tertiary enrolment; other lower-middle-income innovation achievers find it difficult to excel in this area.

Upper-middle-income innovation achievers

A different story emerges when looking at upper-middle-income innovation achievers, which present a persistently strong performance in the Knowledge and technology outputs and Human capital and research pillars. As the data show, high scores in Knowledge and technology outputs can be either the result of efforts in boosting labour productivity, patent activity, and use of utility models (China) or the result of surges in ICT exports (Costa Rica in 2013).[2] Results such as these illustrate why some countries manage to be persistent innovation achievers while others do not, and how some strategies can be greatly effective in producing tangible results. Furthermore, countries adopt different strategies to support human capital and research, which results in different areas of excellence. For example, relative to their income-group peers, Malaysia and Thailand excel in the number of graduates in science and engineering, while China excels at improving basic education and the quality of universities.

Another important area of strength for upper-middle-income innovation achievers is found in the Business sophistication pillar, particularly in Knowledge workers and Knowledge absorption. Innovation achievers at higher levels of GDP focus on improving their share of knowledge workers. Knowledge absorption seems to still play a role at higher income levels. This is not surprising considering that most innovation achievers identified here are heavily embedded in global value and innovation networks. These offer great learning opportunities for local firms interacting with global market leaders.

Conclusions and possible policy implications

A few conclusions from this analysis emerge: First, innovation achievers seem to perform the most strongly in Market sophistication and Knowledge and technology outputs. At lower income levels, countries that outperform their peers focus on removing structural obstacles to innovation, such as poor access to finance and poor linkages within the innovation systems. At higher income levels, efforts concentrate on increasing investments, spurring growth in innovation outputs, and improving human capital.

Second, although the literature emphasizes the important role of human capital and institutions in development and innovation, low- and lower-middle-income innovation achievers are progressing slowly in these areas (especially in Human capital and research). These results do not necessarily imply a lack of policy interest on the part of these countries in these areas; rather, in contrast to other innovation input factors, pursuing and excelling in these elements takes more time. While efforts in certain areas bring more immediate benefits, however, longer-term objectives should not be neglected, and persistence is key.

Countries with above-par performance on innovation input or output factors

Another way to look at global progress in innovation is to analyse the pillar outperformer economies—those that perform above their income-group peers in more than half the innovation input and output pillars. Because of the structure of the GII, monitoring performance at the pillar level helps capture the outcome of policy efforts in particular areas known to be associated with innovation. Noting progress in at least four pillars demonstrates a positive performance in over half of the areas in which the GII focuses to measure innovation.

The number of economies with above-par performance in at least four innovation inputs or outputs has witnessed a steady expansion during 2011–14, increasing from 28 economies in 2011 to 52 economies in 2014.[3] Overall, 67 economies can be identified as outperforming their peers in four or more innovation inputs or outputs in at least one year during 2011–14. Although percentages show a small drop in 2013, the sheer number of countries remained above its 2011 level, confirming the upward trend in outperforming countries (Figure 4). This increase is attributable mainly to more upper-middle- and low-income countries joining the group.

The majority of these economies are from the upper- and lower-middle-income groups (37% and 34%, respectively); only 24% are from the low-income group.

Reviewing the pillar outperformers sheds light on the areas for which countries across different income levels can more easily outperform their peers. The high-income economies in this group outperformed in Human capital and research, implying large differences in educational and research systems among these countries. Results for upper- and lower-middle-income countries are more difficult to interpret, and they point to a frequency of outperformance in Creative outputs for upper-middle-income economies and in Creative outputs as well as Infrastructure for lower-middle-income ones. Low-income economies with above-par performance in at least four innovation inputs or outputs outperform most frequently in Business sophistication; some of them face obstacles to improving in Human capital and research. Finally,

as suggested in the previous analysis of innovation achievers, Knowledge and technology outputs appears to be the most challenging pillar for achieving the outperformance status, given the difficulties of transforming innovation efforts into outputs.

Identifying innovation outperformers and their policy strategies

As indicated earlier, 11 developing countries can be labelled 'innovation outperformers' because they conform to the following two more stringent rules: namely, (1) their GII score relative to their GDP is significantly higher than that of other economies for two or more recent years (including at least 2013 and 2014), and (2) they outperform their income-group peers in a minimum of four innovation inputs or outputs pillars for two or more years (including at least 2013 and 2014). By setting a minimum number of years in which countries have to outperform their peers, the importance of perseverance in innovation policy is emphasized (see Chapter 1).[4] According to the GII database 2011–14, these innovation outperformers are from five regions:

Southeast Asia and Oceania
- China
- Malaysia
- Mongolia
- Viet Nam

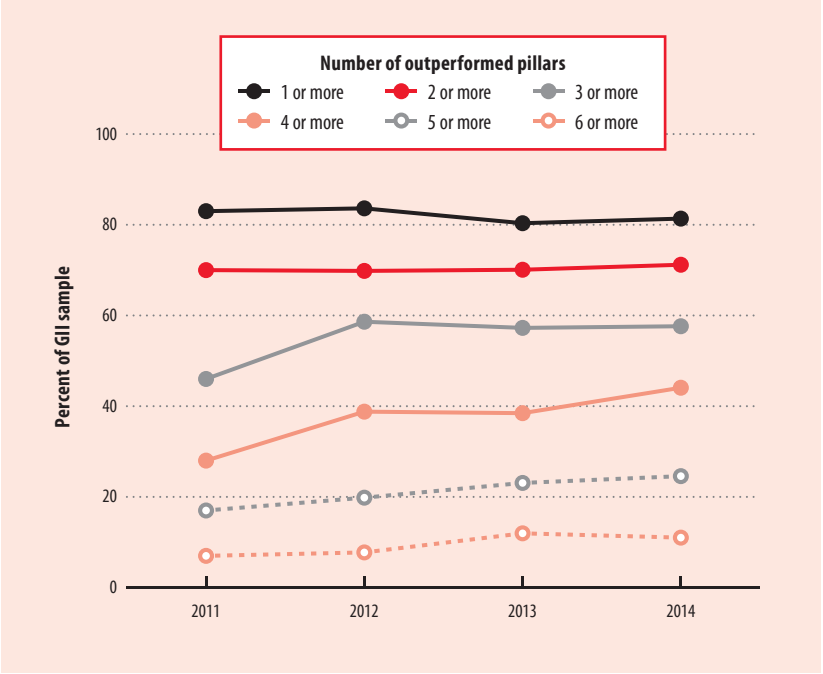
Northern Africa and Western Asia
- Armenia
- Georgia
- Jordan

Sub-Saharan Africa
- Kenya
- Uganda

Central and Southern Asia
- India

Europe
- Republic of Moldova

Figure 4: Pillar outperformers, percentage of GII sample, 2011–14



Note: This figure does not include the GII top 25 economies in each year.

The group of countries identified above is quite heterogeneous. This section presents a brief review of policies and their outcomes in each of these countries. Some of them—namely China (Chapter 6), Georgia (Chapter 7), India (Chapter 8), Kenya (Chapter 9), Malaysia (Chapter 10), and Uganda (Chapter 11)—are reviewed in more detail in the corresponding country chapters.

Armenia, from the lower-middle-income group, was both an innovation achiever and a pillar outperformer in all seven pillars during 2012–14. Armenia is making considerable efforts to strengthen its innovation system, which has become one of the strategic priorities of the Armenian authorities. Its strongest performances are in Institutions, thanks to its favourable business environment and labour market flexibilities; and in Knowledge and technology outputs, the result of high scores in domestic patent and utility model applications, scientific publications, and communications, computer and information services exports. High scores in ICT exports might be explained by the narrow strategic focus adopted by the Armenian innovation strategy. Many new initiatives—such as incubators, initiatives to revert the diaspora, and a strategy for the growth of export-oriented industries—explicitly target the ICT industry. Although this policy seems to have been quite successful (Armenia was ranked 91st in ICT service exports in 2012 and jumped to 30th position in 2013, 23rd in 2014, and 21st in 2015), these policies could usefully be extended to other industries. Poor linkages, especially between universities and industry, reduce the innovation performance of the country. This weakness is related to the narrow interpretation of innovation adopted by Armenian authorities, who are focusing on frontier

technological innovations while leaving aside other aspects of the innovation system such as linkages. Science and innovation are separately managed even at the highest levels of government, split between the State Committee of Science and the Ministry of Economy.[5]

China is the only country that has moved rapidly closer to the group of top 25 countries of the GII, a sign of its exceptional policy persistence in science, innovation, and intellectual property matters. It scored above the average of the upper-middle-income group in five to six innovation inputs and outputs for each of the years 2011–14. By 2014, taking account of the various scaling factors used in the GII, China excelled above almost all other economies in Knowledge and technology outputs, ranking 2nd worldwide, after Switzerland. China placed in the top three positions in the number of domestic resident patents and labour productivity growth. Its scores in utility model applications and high-tech exports also contributed to its strong performance in Knowledge and technology outputs. Despite the evident progress in the quantity of innovation outputs, the quality of these outputs has been questioned (see Chapter 6 by Chen et al.). In recent years, China has significantly improved the quality of its universities, but improvements in the other two indicators are limited (see Box 3 in Chapter 1).

Georgia has consistently outperformed its peers in Institutions, Human capital and research, and Knowledge and technology outputs during the period under consideration. In Chapter 7, Chaminade and Moskovko suggest that radical reforms beginning in the early 2000s were successful at developing a more business-friendly regulatory environment and reducing corruption. These efforts facilitated business operations and attracted foreign direct investment (FDI). Although Georgia outperformed its peers in Human capital and research and Knowledge and technology outputs as well, these results seem to be the consequence of extraordinarily high scores in a few indicators only, namely the pupil-teacher ratio in secondary education and labour productivity growth. Improving the quality of its education and research systems is indeed among the biggest challenges ahead for Georgia.

India is the only country from the Central and Southern Asia region to appear in this group. During 2011–14, India performed above the lower-middle-income group average in Infrastructure, Market sophistication, Knowledge and technology outputs, and Creative outputs. In some of these inputs and outputs, the Indian performance can be explained by the singularity of the Indian case. Despite being a lower-middle-income country, India is considered an influential global player and an emerging industrializing economy. For its level of development, India has a strong specialization in software, a high-tech industry, and an impressive set of clusters of excellence (see the chapter 'Innovation Clusters Initiative: Transforming India's Industry Clusters for Inclusive Growth and Global Competition' in the GII 2013).[6] This partially explains the country's performance in Knowledge and technology outputs, where its highest score is in communications, computer and information services exports. As Chapter 8 by Gopalakrishnan and Dasgupta discusses, a long series of innovation policies contributed to create the necessary conditions for transforming India into a knowledge-based society. Despite its remarkable performance, however, India is still facing a number of challenges. Among others, its huge and young population puts the education system under stress and its regulatory environment discourages entrepreneurs from starting new businesses.

Jordan is one of three economies from the Northern Africa and Western Asia region and the only one that is signalled as an innovation achiever in all four years. Its performance was particularly strong in Institutions, thanks to its scores in Regulatory environment: Jordan has ranked 1st since 2012 in labour market flexibilities and the Creative outputs pillar. Despite being an innovation achiever every year since 2011, Jordan's overall ranking in the GII fell from 41st in 2011 to 64th in 2014 (and now 75th in 2015). Between 2012 and 2014, Jordan's main challenges related to its poor performance in Market sophistication, in particular in the indicators measuring ease of getting credit and protecting investors. Performance in this area improved in 2015, but not enough to compensate for the lower rankings in almost all other areas (except for Infrastructure). For example, although Jordan performed well in Business sophistication in the past because of solid improvements in innovation linkages, in 2015 it lost 34 spots in this area. Similarly, in Knowledge and technology outputs Jordan lost 23 positions in the 2015 rankings, almost reaching again the position it held in 2012. Limited evidence, however, exists to determine which policies can explain this performance.

Kenya is one of the two Sub-Saharan Africa nations identified in the group of innovation outperformers. In the most recent years Kenya obtained its highest scores in access to Credit and Trade and competition. Kenya is also performing well in Education as a result of

consistently high investments in education. As suggested in Chapter 9 by Ndemo, efforts by Kenya's local government and numerous entrepreneurial initiatives have activated a previously stagnant innovation system. Kenya is a country that is producing exciting new innovations by using modern technologies—mainly ICT-based ones. This new innovative spirit is converting Kenya into one of Africa's leaders in ICT and attracting multinational corporations to set up research laboratories in the country (the success of this attraction is also evidenced by the increasingly high scores in percentages of R&D financed by foreign firms). A comprehensive policy for science, technology, and innovation focused on stimulating entrepreneurship via incubators, technology parks, and other research infrastructure is expected to further encourage entrepreneurship. These efforts are also aimed at stimulating collaborations and partnerships, especially between universities and firms. Despite the existence of a policy framework, however, innovation is still not acknowledged as a key driver of economic growth. As a consequence, resource allocation to R&D is often not guaranteed and the little that is allocated to research organizations is spent on recurrent expenditures.

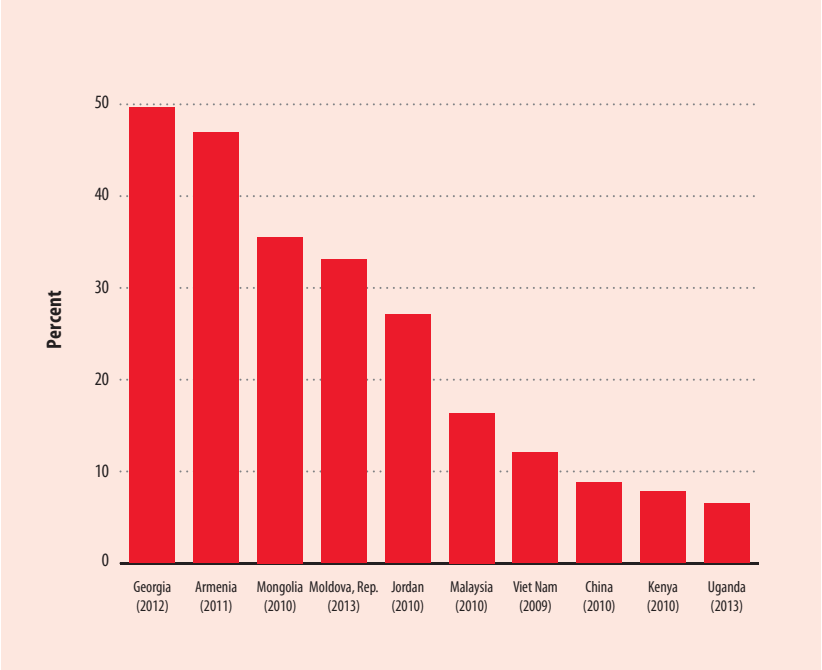
Malaysia is the only economy out of the 11 identified that outperformed consistently and in all innovation inputs and outputs throughout the whole period. In 2014 it performed better than 75% of the countries included in the entire GII sample in Human capital and research, Infrastructure, and Market and Business sophistication. In Human capital and research, Malaysia improved the most in R&D, moving from 54th position in 2011 to 32nd in 2014. The country also made considerable gains in Institutions, improving especially its business environment. Since 2012 Malaysia has ranked 1st in ease of getting credit and very highly in investment-related variables. Apart from creating a favourable business environment, policies have focused on increasing the number of graduates in science and engineering, a variable in which the country has ranked persistently high. Between 2011 and 2014, Malaysia ranked in the top three positions also in high-tech imports and exports, reflecting its successful integration in global value chains. As discussed in Chapter 10 by Rasiah and Yap, such an extraordinary performance is the fruit of large public investments and policy coordination between the various government agencies in charge of science, technology, and innovation. Malaysia still needs to make considerable progress in fostering knowledge-based activities and reducing technological dependence, as confirmed by its low scores in Knowledge workers, Innovation linkages, and Knowledge creation. These are typical issues for net importers of technology; in these cases, developing domestic innovation capabilities is needed to move from absorbing foreign knowledge and technology to creating domestic new knowledge and technologies.

The Republic of Moldova has been identified as one of the rising innovators in Europe. Its performance has been consistent in almost all innovation inputs and outputs during 2011–14. It performed above 75% of the economies in the GII in Knowledge and technology outputs and Creative outputs. These high scores are the result of high numbers of utility model applications and trademark registrations. Indeed, government efforts towards increasing intellectual property rights awareness and encouraging its use led to the establishment of the State Agency on Intellectual Property and the implementation of a National Intellectual Property Strategy, which have been in place since 2011 and 2012, respectively. These efforts may at least partially explain the country's high scores in these indicators. The Republic of Moldova performs poorly in Business sophistication, however, because of weak innovation linkages—in particular its limited cluster development and university-industry collaborations.

Mongolia scored above its lower-middle-income peers in all input-side variables during 2011–13, and in 2014 it outperformed its peers in all seven innovation inputs and outputs covered by the GII.[7] In 2014 the country performed higher than 77% of all economies in the GII in Market sophistication. This signals improvements in access to credit. Mongolia performs well also in Infrastructure, more specifically in gross fixed capital formation. This is not surprising given the country's extremely high growth rates over the last few years. Despite being an innovation achiever also in 2015, Mongolia lost some positions in the GII ranking. This can be explained in part by the country's slowdown in economic performance and its lower position in FDI inflows (Mongolia ranked 1st in this indicator in 2014 but dropped to 6th this year). The next months will be critical to deciding Mongolia's future innovation path. The country lacks the financial resources to exploit new knowledge and it lacks adequate infrastructure to either guarantee supply or ensure logistical and technical support. It is therefore difficult for Mongolia to fully exploit its innovative potential.[8]

Uganda is the second country from Sub-Saharan Africa and the one that presents the least robust

Figure 5: Percentage of population aged 25 years and older with post-secondary education, by year



Source: UNESCO Institute for Statistics database, June 2015.
Note: 'Post-secondary education' refers to UNESCO's International Standard Classification of Education (ISCED) level 4 or higher.

innovation performance in this group of innovation outperformer countries. Between 2011 and 2014, Uganda outperformed its low-income peers in Institutions and Creative outputs and showed a strong performance in Business sophistication, in particular in innovation linkages (thanks to high R&D financed from abroad) and Knowledge absorption (thanks to high FDI inflows and high-tech imports). As detailed in Chapter 11 by Ecuru and Kawooya, Uganda has maintained political stability since 1986 and has accompanied this stability with institution-building reforms. These efforts may explain the country's performance in Institutions and FDI inflows. Uganda's main weaknesses relate to its Regulatory environment, which discourages entrepreneurship, and its poor performance in Tertiary education and R&D. The implementation of the Strategic Investment Plan for 2012–17 is expected to mainstream business registration, thus improving Uganda's current low scores on the ease of starting a business. The policy focus on STEM (science, technology, engineering, and mathematics) might positively affect results on Tertiary education, improving especially the indicator on the number of graduates in science and engineering. The challenge in this area will be to match the policy commitments to STEM promotion with financial resource allocations.

Viet Nam is one of the four South East Asia and Oceania countries identified in this list. Its performance has been consistently high in Infrastructure, Knowledge and technology outputs, and Creative outputs. Viet Nam has been working towards developing its national innovation system by improving its regulatory framework and engaging in institution building.[9] Integration in global trade via global value chains and the attraction of FDI is creating opportunities for learning and upgrading. This is well captured by the GII, which evidences a good performance in Business sophistication, in particular in Knowledge absorption (through high-tech imports and FDI inflows) and Innovation linkages (via clusters). Improvements in these innovation inputs are also likely to have influenced Viet Nam's performance in Knowledge and technology outputs, as shown by its higher labour productivity and improved quality of production through ISO certifications. Viet Nam is performing weakly and having difficulty in improving all the dimensions of the Institutions pillar in addition to Research and development. It is also facing hurdles in its investment environment as well as trade and competition (Market sophistication).

Improved education and research systems: Benefitting innovation outperformers

Overcoming a poorly educated population is a crucial to improving innovative performance (see Chapters 1 and 2 of the GII 2014).

As previous sections have shown, developing countries with above-par performance in innovation often still perform poorly in Human capital and research. Are these 11 countries doing better in this regard? The analysis in this section shows to what extent continued poor performance in this pillar applies to the 11 countries identified as outperformers.

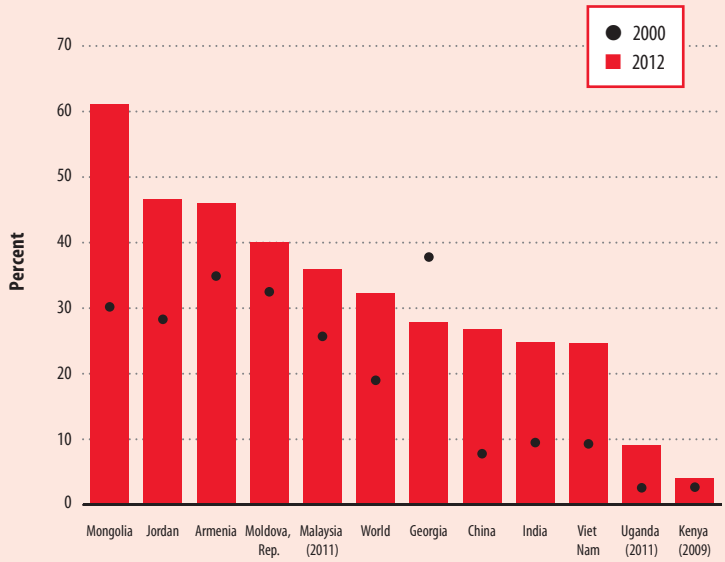
Figure 5 illustrates the educational attainment of the population, which provides an important context for innovation performance. Without a skilled workforce, proxied here by the level of qualification achieved, it is difficult to innovate in a significant way. The figure shows a

mixed picture for 10 of the innovation outperformers.[10] Out of the 95 countries in the UNESCO Institute for Statistics database for which there are data, Georgia occupies 5th place, with half its population having attained a post-secondary degree, closely followed by Armenia in 8th place (47%). Mongolia, the Republic of Moldova, and Jordan are in the top half of the rankings, but the percentages of post-secondary graduates in Malaysia, Viet Nam, China, Kenya, and Uganda are rather low.

All the outperformer countries except Georgia have improved on their gross enrolment ratio (GER),[11] charted in Figure 6, since 2000. Five of the eleven are doing so in percentages above the global average. In Mongolia, the GER stood at 61.1% in 2012, up from 30.2% in 2000. For eight of the countries, the annual average growth rate was higher than the growth rate for the GII sample average. Uganda (12.0%) and China (10.8%) experienced double-digit growth rates, ahead of Viet Nam (8.4%) and India (8.3%). Lower-than-average growth rates were observed in Armenia, the Republic of Moldova, and Georgia.

Proposing and implementing policies that support R&D is one of the key strategies needed to secure technological potential and, therefore, innovation and economic growth. In order to reach the income levels of high-income countries, low- and middle-income countries need to expand their access and capacity to use technology. Domestic R&D is also critical to the process of 'catching up' and adapting technologies developed abroad.[12] In the absence of a sufficient level of R&D, the absorptive capacity needed to take full advantage of technology transfer is often lacking, as is the capacity to design new pathways to production and establish new markets.[13]

Figure 6: Gross enrolment ratio in tertiary education, 2000 and 2012



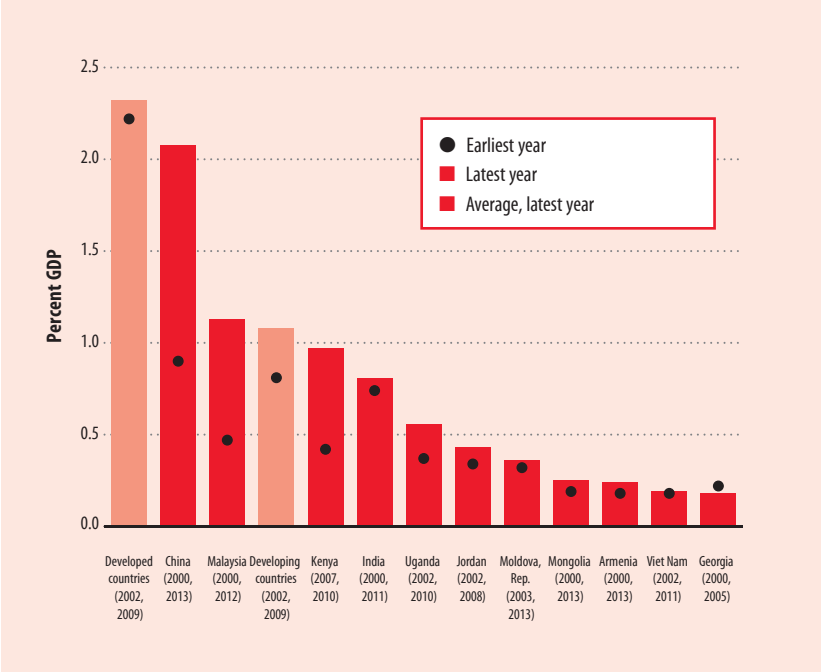
Source: UNESCO Institute for Statistics database, January 2015.
Note: Years in parentheses refer to the year of the latest available data.

Figure 7 shows the expenditure on R&D (expressed as a percentage of GDP) of these 11 economies. China's progress has been remarkable: It is the only one that comes close to the developed countries' average and, indeed, is poised to soon overtake it. However, only one innovation achiever—Malaysia—performs above the developing countries' average. Kenya is close to the developing countries' average and the 1% threshold that many governments have set as target. India's R&D expenditure stands at 0.8%. The other countries, however, display lower R&D investment expenditures.

The number of researchers (expressed per million inhabitants) illustrates a somewhat different picture. Most of the innovation achievers are now above the developing countries' average, led by Malaysia (see Figure 8). Especially Kenya, but also India and Uganda, which are doing relatively well in terms of R&D expenditure, are doing much worse in terms of the number of researchers. This discrepancy is posing a bit of a puzzle, because wages and salaries of researchers are an important component of R&D expenditure, and therefore the two concepts are closely linked. Most likely it is a result of the methodological procedures adopted when collecting the data; these procedures present a reason for concern, and are something that should be addressed by these countries.

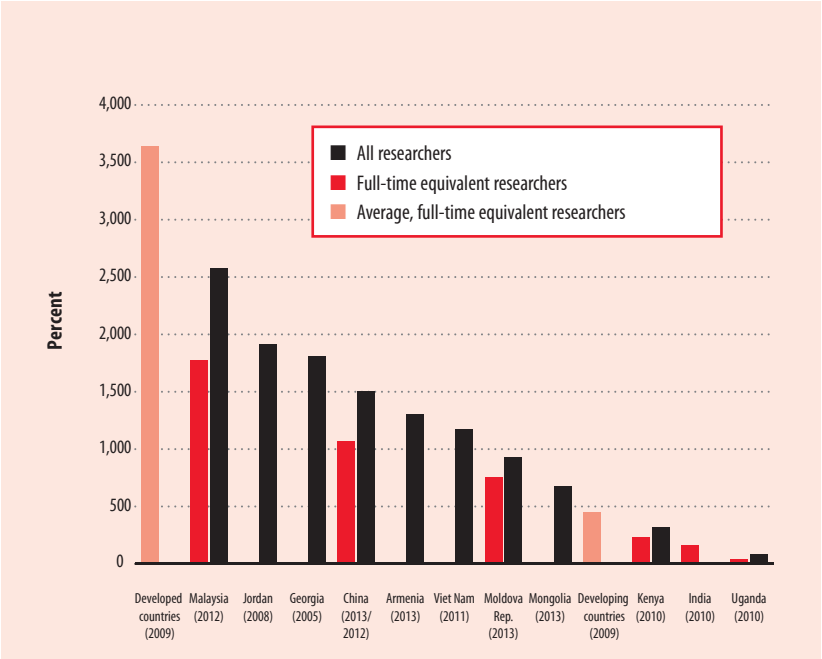
This section of the chapter has shown that the 11 economies identified in this report as persistent innovation outperformers do not show a homogeneous performance in indicators of Human capital and research. Countries such as Georgia, Mongolia, the Republic of Moldova, Jordan, and Malaysia have a more developed tertiary education system; others, like China and Malaysia, are stronger in R&D.

Figure 7: R&D expenditure as a percentage of GDP, around 2000–13



Source: UNESCO Institute for Statistics database, January 2015
Note: Years in parentheses refer to the year of the latest available data.

Figure 8: Researchers per million inhabitants, latest year available



Source: UNESCO Institute for Statistics database, January 2015.
Note: The year in parentheses is the year of the latest available data. Jordan, Georgia, Armenia, Viet Nam, and Mongolia have data only for the headcount number of all researchers (full and part time); data for full-time equivalent researchers are not available for these countries. India has data for only the full-time equivalent researchers.

Conclusions

In spite of the often fragmented innovation systems (which often depend on external sources of knowledge and technology), developing countries are capable of making strides in innovation.

Among the 11 outperforming economies, this chapter identifies some persistent outperformers. Relative to their peers, these countries have sustained a strong innovation performance over the last years. The degree of heterogeneity among these countries is significant: They range from relatively small European and Western Asian countries such as Georgia, the Republic of Moldova, and Jordan to important global players such as China and India. One commonality among them is their relatively stronger performance in production of knowledge and technologies.

Just how developing countries can further boost their innovation performance is the subject of policy debate (see Chapter 1). Improving innovation linkages and knowledge absorption is crucial for developing countries to outperform in innovation. Building critical strengths in innovation inputs such as institutions, education, and research takes time and is more difficult to achieve. Yet, in the more medium run, these factors will be essential to allowing developing countries to more effectively translate innovation efforts into knowledge and technology outputs.

Notes

1 The 25 high-income economies that lead the GII rankings (see Figure 3 in Chapter 1) are not considered in Chapter 2.

2 The high score of Costa Rica in Knowledge and technology outputs reflects the effect of foreign direct investment (FDI) and the country's integration in global value chains.

3 These figures exclude the top 25 innovation performers.

4 With the exception of Georgia, which this year is identified as performing at development level, all other economies remained innovation achievers in 2015. Jordan did not show above-par performance in four or more innovation inputs and outputs. While Georgia remained quite close to the achiever 'borderline' and could easily become part of this group in upcoming years, Jordan will require additional efforts to sustain innovation.

5 See also UNECE, 2014.

6 Mitra, 2013.

7 It has to be noted that for various indicators within pillar 6 (Knowledge and technology outputs) Mongolia has no available data. This happens mainly in sub-pillar 6.2, Knowledge impact.

8 The authors thank Mike Turner, Chair of the Business Department at Broward College HCMC, Viet Nam Campus, for his contribution on the innovation system in in Mongolia.

9 See also OECD and World Bank, 2014.

10 No data exist for India.

11 The 'gross enrolment ratio' is defined as the number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education. For the tertiary level, the population used is the 5-year age group starting from the official secondary school graduation age.

12 Archibugi and Pietrobelli, 2003.

13 UIS, 2014.

References

Archibugi, D. and C. Pietrobelli. 2003. 'The Globalisation of Technology and its Implications for Developing Countries: Windows of Opportunity or Further Burden?' *Technological Forecasting and Social Change* 70 (9): 861–83.

Dutta, B., D. Benavente, B. Lanvin, and S. Wunsch-Vincent. 2013. 'The Global Innovation Index 2013: Local Dynamics Keep Innovation Strong in the Face of the Crisis'. In *The Global Innovation Index 2013: The Local Dynamics of Innovation,* eds. S. Dutta and B. Lanvin. Geneva, Ithaca, and Fontainebleau: Cornell, INSEAD, and WIPO. 3–67.

Dutta, S., R. Escalona Reynoso, A. Bernard, B. Lanvin, and S. Wunsch-Vincent. 2014. 'The Global Innovation Index 2014: Nurturing New Sources of Growth by Developing the Human Factor in Innovation'. In *The Global Innovation Index 2014: The Human Factor in Innovation,* eds. S. Dutta, B. Lanvin, and S. Wunsch-Vincent. Geneva, Ithaca, and Fontainebleau: Cornell, INSEAD, and WIPO. 3–68.

Mitra, S. 2013. 'Innovation Clusters Initiative: Transforming India's Industry Clusters for Inclusive Growth and Global Competition'. In *The Global Innovation Index 2013: The Local Dynamics of Innovation,* eds. S. Dutta and B. Lanvin. Geneva, Ithaca, and Fontainebleau: Cornell, INSEAD, and WIPO. 107–14.

OECD (Organisation for Economic Co-operation and Development) and World Bank. 2014. *A Review of Science, Technology and Innovation in Vietnam.* Paris: OECD Publishing.

Schaaper, M. 2014. 'The Human Factor in Innovation'. In *The Global Innovation Index 2014: The Human Factor in Innovation,* eds. S. Dutta, B. Lanvin, and S. Wunsch-Vincent. Geneva, Ithaca, and Fontainebleau: Cornell, INSEAD, and WIPO. 69–75.

UIS (UNESCO Institute for Statistics). 2014. *Higher Education in South and East Asia: Expanding Out, Expanding Up: The Rise of Graduate Education and University Research.* Montreal: UIS.

UNDESA (United Nations Department of Economic and Social Affairs). 2015. *Transforming Our World: The 2030 Agenda for Global Action: Final Draft of the Outcome Document for the UN Summit to Adopt the Post-2015 Development Agenda.* 8 July. https://sustainabledevelopment.un.org/content/documents/7603Final%20draft%20outcome%20document%20UN%20Sept%20Summit%20w%20letter_08072015.pdf.

UNECE (United Nations Economic Commission for Europe). 2014. *Innovation Performance Review of Armenia.* Geneva: United Nations Publications.

Innovation Policies for Development

Micheline Goedhuys, Hugo Hollanders, and **Pierre Mohnen,** UNU-MERIT (United Nations University and Maastricht University)

Innovation is a key driver of economic success. Companies in developed economies innovate to reduce production costs, to develop new products, and to create new markets. Innovative enterprises are shown to be economically more successful than firms that rely on tried and true processes and approaches.[1] Innovation also generates unintended spillover benefits for other companies and consumers—for example, by lowering the prices or increasing the quality of intermediate or final demand products. Similar to investment in research and development (R&D) activities, investment in innovations by enterprises is at a level below what would be optimal for society because of market and system failures (Box 1). Governments in developed economies have therefore been supporting business innovation by offering various kinds of direct and indirect support programmes, including loans, grants, tax incentives, and tax reductions.

Globalization and innovation

With globalization, firms in emerging and developing economies find themselves under more and more pressure to engage in continuous innovation. R&D, software, design, engineering, training, marketing, and management all play an increasingly important role in the production of goods and services, even in more traditional industries, such as textiles and food. In addition, rising international standards dominate in international trade and global value chains. The competitiveness of both companies and countries therefore depends on their ability to innovate and move in the direction of frontier technology and knowledge.

However, there is a wide heterogeneity among enterprises in emerging economies: some companies operate close to the technological frontier and rely more on their own research and innovation efforts, either alone or in collaboration with others, to develop new products and improve production processes. Emerging countries such as India, China, and the Republic of Korea host companies that are technological leaders in their respective industries. But besides those top-performing companies, emerging economies are also hosting large groups of micro and small businesses, operating far below the frontier of innovation, with basic technologies and low levels of human capital. Raising the productivity of these smaller producers through innovation and the adoption of better technologies will have a substantial aggregate impact on a country's economic growth, employment, poverty alleviation, and sustainable development.

With such heterogeneity in the productive sector, innovation in emerging and developing countries is also diverse in nature; it is determined not only by the level of technological complexity, industry of activity, and firm size, but also by the institutions and infrastructure where the company operates. Innovation

Box 1: Market and system failures

Market failures are the result of (1) excessive uncertainty, (2) absence of markets for risks, (3) insufficient appropriability (leading to failure to appropriate returns from innovation and new knowledge), (4) financing problems in the presence of information asymmetries, (5) failure of markets to assign values to externalities (impacting knowledge diffusion), and (6) undervaluation of public good technologies in firms' strategies. The first two types of market failures involve risk aversion hampering innovation activity; this affects small and medium-sized enterprises in particular because these firms have limited sources of funds.

Not only can markets fail to deliver optimal results but so can the lack of a favourable business environment for innovation, which is referred to as 'system failure'. The concept of system failure aims at ensuring that the innovation system works effectively as a whole by removing blockages that hinder the effective networking of its components.[1]

Note

1 European Commission, 2009.

Box 2: M-PESA: An example of inclusive innovation

M-PESA ('M' for mobile; 'pesa' is Swahili for money) is a mobile phone–based money transfer and micro-financing service, launched in 2007 by Vodafone for Safaricom and Vodacom. M-PESA allows users to deposit, withdraw, and transfer money easily with a mobile device. Users are charged a small fee for sending and withdrawing money using the service. M-PESA is a branchless banking service; its customers can deposit and withdraw money from a network of agents that includes airtime resellers and retail outlets acting as banking agents. M-PESA has spread quickly, and by 2010 had become the most successful mobile phone–based financial service in the developing world. By 2015, a stock of about 20 million M-PESA accounts had been registered in Kenya. It has since expanded to South Africa and India, among others, and in 2014 to Romania.

Sources

The Economist, 2013; Mas and Radcliffe, 2010; Safaricom, no date.

surveys from developing countries have provided data on the characteristics of the innovation process in developing-country firms. At the aggregate level and in comparison with data from developed economies, innovation in developing countries is more incremental than radical and takes place in an informal setting more often than it does in formal R&D laboratories. Innovations are primarily driven by investments in and mastery of new machinery and equipment that embody more advanced technologies; innovations less often arise from new products or technologies developed through R&D. Furthermore, marketing and organizational innovations also play an important role, especially in countries that liberalized and privatized their economies, thus forcing their companies to restructure.[2]

In this context, governments are increasingly challenged to develop policies that stimulate innovation and facilitate large-scale diffusion of existing knowledge and improved technologies. This is a complex process that, depending on target groups and on the government's objectives—for example, employment growth or reduced environmental impacts—combines interventions to stimulate embodied technology acquisition with policies to develop research capacity and raise the human resources needed to absorb, adapt, and master technologies developed elsewhere. For emerging countries that are catching up, experience shows that technology adoption alone is no longer sufficient to maintain a high-growth scenario. These countries too must invest in innovation, and governmental support is crucial for promoting it.

Social challenges and innovation policies in developing and emerging economies

In developing and emerging economies, the importance of innovation is widely recognized and innovation policies occupy a central role in their development plans and strategies. Emerging countries, by definition, are growing rapidly and expanding production at impressive rates. However, they also face particular challenges, two of which stand out. First, all emerging countries with the exception of China have very young and growing populations. The rapidly expanding young labour force is often facing high levels of unemployment, resulting in fragile groups, widespread poverty, and unequal growth. Another problem that lines up with rapid development and demographic change is the increased pressure on natural resources and pollution—a pressure that is felt both locally and in international markets. As countries develop, their energy needs increase and a limited availability of energy can quickly become a binding constraint. In the same way, the availability of land for housing and food production is a critical factor. This is especially critical in countries where the agriculture sector and agro-processing comprise the driving force of growth, and where land tenure systems could encourage further land fragmentation.

In emerging countries, innovation is seen as key to addressing pressing societal problems such as pollution, health issues, poverty, and unemployment. The role and significance of innovation goes beyond the objective of economic success. Rather it should be seen through the lens of inclusive development because it can address poverty and health issues, and through the lens of environmental sustainable development because it can address problems of pollution and energy provision.

Illustrating this point, in many low-income developing countries local demand comes from individuals whose preferences, aspirations, and budgets are of a different nature than those in high-income countries. So-called inclusive innovations directed at this stretch of the population may be low-priced but have a high social value because they allow large segments of society to benefit from them. Low-cost manpowered irrigation pumps or folded-paper microscopes for US$0.50 that

offer the same quality as desktop microscopes are examples. Another example from Kenya is M-PESA (see Box 2), as are the many useful mobile phone applications that have been developed to provide quick and accurate market information and production technologies to farmers in rural areas (such as M-Farm and iCow),[3] to give health-related information (such as Mimba Bora),[4] or to provide entertainment (such as Matatu and Afrinolly).[5]

Emerging economies have a high demand for agricultural and biotechnological research, as well as a need for more research on neglected tropical diseases such as dengue, river blindness, tropical parasites, and malaria, as well as acute respiratory infections, diarrhoea, tuberculosis, and HIV/AIDS. Influencing the direction of the international research agenda into these research domains has important consequences for multiple areas, such as agricultural production, nutrition, and health.

With innovation occupying a central place in a sustainable and inclusive development agenda, it is not surprising that innovation policies can be can be found in different policy domains, strategies, and pieces of legislation. For instance, in Uganda—one of the more successful countries in terms of innovation, and discussed more in detail in Chapter 11—numerous policies that support research and innovation are identified. These include the country's National Industrialization Policy; its National Science, Technology and Innovation Policy 2009; its National Development Plan 2010; and its Agricultural Sector Development Strategy and Plan. The same holds for Kenya, where the political institutions supporting innovation are so numerous that coordination and harmonization issues arise (Chapter 9). As Table 1 shows, experts assessed that by 2014 both countries had made considerable progress in meeting their science, technology, and innovation (STI) policy objectives and priorities.

Table 1: Science, technology, and innovation (STI) policies: Kenya and Uganda, 2014

Policy characteristic	Kenya	Uganda
Title	• Science, Technology and Innovation Act (2013) • Draft National Science, Technology and Innovation Policy (2012)	• National Science Technology and Innovation Policy (2009)
Objectives and priorities (percent of goals reached as formulated in national policy)		
Research capacity	75%	75%
Human resources	75%	50%
Network of researchers	50%	75%
ICTs	50%	75%
Institutional capacity	25%	50%
Links with the private sector	25%	25%
STI policy authority	• Presidential Advisory • Parliamentary Committee on Education, Research and Technology • National Commission on Science, Technology and Innovation • Ministry of Education, Science and Technology	• Uganda National Council for Science and Technology (UNCST) operates under Ministry of Finance, Planning and Economic Development)*

Source: Iizuka et al., 2015. For more details on the entries in the table see http://www.merit.unu.edu/deipafrica.
* The UNCST is expected to become part of the new Ministry of Education, Sports, Science and Technology.

Innovation policies have been recently introduced in most emerging economies. Even in developing and least-developed countries, innovation is at the core of the political debate. The Republic of Moldova, for example, introduced its innovation strategy 'Innovations for Competitiveness' for the period 2013–2020. This strategy aims to stimulate innovation in firms and society in general.[6] In another example, recent policy initiatives in Viet Nam are setting the stage for developing a mature national innovation system.[7]

Broad tendencies of innovation policy frameworks

Governments in developed countries have a whole range of instruments at their disposal to stimulate firms to invest more in research and innovation. These tools include direct and indirect support measures for R&D and innovation, institutional and competitive funding instruments, and supply-side and demand-side measures.[8] In Europe the range of policy instruments is most diverse: not only are European Union (EU) Member States adapting measures to their own needs but also the European Commission is supporting research and innovation with instruments open to firms in all Member States and other European countries. A recent study, drawing lessons from 10 years of European innovation policies, shows that Europe is a thriving environment for such policies.[9]

By contrast, because of their reduced fiscal space, governments in developing and emerging countries have less room to manoeuvre. Given their limited tax income, in part the result of the large size of

their informal economy, these countries have less leeway to correct for market failures. Since innovation processes are also more oriented towards knowledge diffusion and absorption, as described above, the focus of innovation policies in these countries differs from policies in more advanced economies.

Because developing and emerging country governments do not have the same latitude as those in developed countries to hand out R&D tax credits, subsidies, or government procurement contracts, firms in these countries largely rely on themselves to build up a stock of technological knowledge. Instead of investing in R&D, to a large extent these firms try to reap the benefits of catching up through adoption and international technology transfer. Among the various possible channels for transfer are imports of capital goods, subcontracting agreements, technical assistance programmes, technology licensing contracts, international standards certification, and inward foreign direct investment.

In the context of such innovation processes, and considering that most of the firms in developing countries are small, without patents, and with little experience in intellectual property protection, these firms should favour tax incentives over direct R&D support in the form of grants or R&D subsidies. It gives them immediate funds to innovate and invest without having to write grant applications that would partially leak their innovative ideas. Moreover, given the small size of these firms' R&D budgets, the R&D tax incentives policy does not suffer from the presence of deadweight loss (financing R&D that would have taken place anyway).

In part for the reasons just mentioned, firms in developing countries often do not have the technological expertise or the financial means to run R&D laboratories. This does not prevent them, however, from being creative and finding solutions to day-to-day problems by way of incremental innovations—on-the-shop-floor kinds of small improvements in engineering, management, or marketing and training their workforce. The success of these efforts depends on their technological capabilities. These capabilities are necessary to select and acquire the adequate technologies, to adapt those technologies to local circumstances, and to operate and develop them further, and they include skills, experiences, attitudes, and schooling. In cases of successful development of technological capabilities in an economy, local firms gradually move from adapting imported technology to indigenously developing technology, as in the cases of the Republic of Korea and Taiwan, Province of China.

The fact that companies rely less on formal R&D puts into perspective the policies of some emerging countries that aim to achieve target levels of R&D/GDP ratios (e.g., a 2% target is presently set for India) comparable to those of industrialized countries. Emphasis in emerging countries should be placed on reaching R&D levels as much as on providing the right framework conditions that stimulate a process of innovation and knowledge diffusion: political stability and supportive institutions; good and widespread technical and tertiary education to enhance absorptive capacity; reliable and widespread basic infrastructure; excellent provision of information and communication technology (ICT) property rights; and stronger links and interaction between publicly funded research institutes and private companies.

Each of these components is represented in the GII framework. In the context of emerging economies, some of the pillars cannot be overemphasized. Institutions are important because they create the proper framework conditions for doing business.[10] All countries are currently developing legislation and innovation support plans. The success of this approach is seen in Uganda, which embarked on a period of political stability since 1986 accompanied by strong innovation and growth performance (see Chapter 11).

Human capital and research supply the necessary skills, but equally serve other social targets. There is usually a gap between the demand for education and the availability of resources. Improvements in primary education and in primary and secondary technical education are vital for basic technological capabilities. But the development of more specialized capabilities is also imperative in key areas where technologies—such as ICTs and biotechnology—are changing rapidly. This may require higher education in technical, scientific, and agricultural disciplines. In Uganda, for instance, scholarship schemes prioritize students in STEM (science, technology, engineering, and math) fields and attract diaspora in these fields. In Kenya, by contrast, tertiary education has been neglected, and various institutions are now created to coordinate technical education and vocational training.

Infrastructure, in particular ICTs, has a leveraging effect on the exchange of knowledge and new technologies. Low-cost ICTs facilitate inclusive innovations such that all people in society will benefit from the advantages of new products and processes. Access to ICTs will foster the diffusion of information

and knowledge that may have a more profound societal impact than the creation of new knowledge (such as the M-PESA example in Kenya).

There exists a broad consensus that stronger export orientation triggers innovation and the development of capabilities. Competing in international markets requires meeting international technology and quality standards. The body of standards that firms have to implement is rising and relates not only to product standards but increasingly also to process standards, labour standards, and standards for environmental conduct. For firms in developing countries, even more than for firms in advanced economies, the adherence to these standards and the acquisition of certifications are important to reduce transaction costs.[11] But the standards certification process also triggers innovation through improved managerial practices and company-wide operational improvements and training. Policy can play a crucial role in raising awareness of these standards and assisting local firms as they go through the difficult certification procedure.

An innovation policy for developing and emerging economies is thus necessarily multifaceted and complex, involving aspects of education policy, industrial policy, international trade policy, and various other institutional reforms. With limited budgets, most countries will have to make hard choices on where to invest to make the most of their available human and natural resources and their competitive advantage. Choices of smart specialization may also be done in collaboration with other countries.

The ultimate policy mix will depend on a country's broader development objectives, and will have to be made in collaboration with all the stakeholders to maximize the chances of success. Good coordination between ministries and between the private and the government sectors is therefore essential. In other words, the systemic nature of innovation policy needs to be reinforced.

Padilla-Pérez and Gaudin identify the following eight barriers of innovation policy in Central America, but the same barriers are likely to apply to many developing and emerging economies: the absence of high-level political support for STI policies; frequent institutional changes and the absence of long-term planning; modest government support for STI; insufficient enforcement of institutions to promote innovations, such as intellectual property rights and competition; lack of coordination among government agencies and policies; a lack of absorptive capacity and weak educational system; difficulties in financing STI; and a lack of policy evaluations.[12]

The need for progress in metrics

It is essential to monitor the impact of innovation policies in order to determine whether policies have worked and which policies might be most effective. For this, governments need access to relevant, timely, and reliable statistical information. A wide range of statistics is available in developed countries, including, among others, data on educational skills, R&D expenditure, patent applications, trademarks and designs, and firms' innovation activities (these latter are collected using innovation surveys). High-quality indicators are essential for good STI policy making because decision making will otherwise be based on partial knowledge of the STI systems already in place.[13]

The first innovation surveys asking firms about their innovation activities date back to the 1980s. Following the recommendations on measuring innovation in the *Oslo Manual*,[14] the European Commission took the initiative in the early 1990s to develop a harmonized questionnaire—the Community Innovation Survey—which is currently used by most European countries and has inspired setting up innovation surveys in countries around the globe.[15] A recent study by the United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics (UIS) has identified fewer than 30 non-European or non-OECD countries that have introduced at least one innovation survey since the early 2000s.[16] Many emerging economies have not yet introduced an innovation survey to measure firms' innovation activities. Not all of the indicators developed for more-advanced economies are equally relevant to less-developed economies. The international standards and protocols developed for collecting data in advanced economies are sometimes incompatible with the STI systems found in many developing countries. For emerging economies this might be less problematic because they are evolving into advanced economies, so the international standards and protocols are more applicable and thus achievable.

A great deal of GDP—as much as 40%—in developing economies is generated in the informal sector. In terms of total employment, the part played by the informal sector is even greater.[17] Currently the innovation surveys conducted in developing countries, however, do not cover firms from the informal sector. As a report on innovation in Ghana shows,[18] the proportion of innovating firms may be lower in the informal than in the formal sector, but nevertheless be quite sizeable. For instance, in Ghana, 72%

of the firms in the informal sector declared themselves to be innovative compared with 90% in the formal sector. Actual innovation surveys do not cover firms in the informal sector because these are not formally registered. It would be interesting to assess innovation in the informal sector and to understand what motivates these firms to be innovative. It is encouraging that new work aimed at better understanding innovation in the informal sector has been ongoing for the last three years.[19] To better capture innovation, our measurement frameworks and tools will have to be adapted in this regard.[20]

The 2015 GII is based on data available for all 141 countries included this year on the various pillars of innovation. This need for pervasive statistics for comparability purposes stands in conflict with the local nature of some innovation characteristics. M-PESA, for instance, is available in several countries but not yet in many others. The use of M-PESA would be a good indicator of creative output pillars, but given its local usage it cannot yet be used as a component of the GII.

Conclusions

Emerging economies are very conscious that innovation plays a key role in an environmentally sustainable and socially balanced growth agenda. Innovation policy has therefore moved to the centre of the policy debate. Because innovation is not only a process of knowledge diffusion, as countries develop, simply adopting existing technologies is no longer sufficient to maintain a high growth rate. Rather countries need to invest in research and innovation to develop products that address their particular needs. Governments are therefore developing innovation-support policies that take into account the specificities of their domestic industries. A few emerging countries have successfully introduced such policies and provide interesting cases from which lessons can be learned on a diverse range of innovation policies.

Notes

1 Mohnen and Hall, 2013.

2 Bogliacino et al., 2012.

3 M-Farm provides Kenyan farmers price information for their products and inputs via SMS text. iCow provides small-scale dairy farmers in Kenya information, via SMS text, on different aspects of their cows' lifecycle, thus raising family incomes by improving milk production. More details are available at http://www.mfarm.co.ke/ and http://icow.co.ke/.

4 Mimba Bora is a mobile application that helps expectant women to monitor their pregnancies. More details are available at http://www.mimbabora.com/.

5 Matatu is a two-player card game originating from Uganda available for smartphones. Afrinolly is an application that allows users in Africa to watch movie trailers, music videos, and concert videos on their smartphones. More details are available at http://www.afrinolly.com/.

6 European Commission, 2013.

7 OECD, 2014.

8 OECD, 2010.

9 Izsak and Markianidou, 2013.

10 Goedhuys and Srholec, 2014.

11 Goedhuys and Sleuwaegen, 2013.

12 Padilla-Pérez and Gaudin, 2014.

13 Tijssen and Hollanders, 2006.

14 OECD, 2005.

15 Arundel and Smith, 2013.

16 Information about the first UIS innovation data collection is available at http://www.uis.unesco.org/ScienceTechnology/Pages/innovation-data-release.aspx.

17 Iizuka et al., 2015.

18 Fu et al., 2014.

19 The full details of this project can be found at http://www.wipo.int/econ_stat/en/economics/studies/. See also de Beer et al., 2013.

20 Charmes et al., 2015.

References

Arundel, A. and K. Smith. 2013. 'History of the Community Innovation Survey'. In *Handbook of Innovation Indicators and Measurement*, ed. F. Gault. Cheltenham: Edward Elgar. 60–87.

Bogliacino, F., G. Perani, M. Pianta, and S. Supino. 2012. 'Innovation and Development: The Evidence from Innovation Surveys'. *Latin American Business Review* 13 (3): 219–61.

Charmes, J., F. Gault, and S. Wunsch-Vincent. 2015, forthcoming. 'Formulating an Agenda for the Measurement of Innovation in the Informal Economy'. In *The Informal Economy in Developing Nations: Hidden Engine of Innovation?* ed. E. Kraemer-Mbula and S. Wunsch-Vincent. New Economic Insights and Policies. Cambridge: Cambridge University Press. Chapter 9.

de Beer, J., K. Fu, and S. Wunsch-Vincent. 2013. 'The Informal Economy, Innovation and Intellectual Property: Concepts, Metrics and Policy Considerations'. *WIPO Economics Working Paper* No. 10. Geneva: World Intellectual Property Organization.

The Economist. 2013. 'Why Does Kenya Lead the World in Mobile Money?' *The Economist explains,* 27 May. Available at http://www.economist.com/blogs/economist-explains/2013/05/economist-explains-18.

European Commission. 2009. *Making Public Support for Innovation in the EU More Effective: Lessons Learned from a Public Consultation for Action at Community Level.* Commission Staff Working Document SEC(2009)1197. Available at http://ec.europa.eu/enterprise/policies/innovation/files/swd_effectiveness_en.pdf.

———. 2013. *The Innovation Strategy of the Republic of Moldova for the Period 2013–2020: 'Innovations for Competitiveness'.* ERAWATCH Policy Documents. Available at http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/md/policydocument/policydoc_0003.

Fu, X., G. Zanello, G.U. Essegbey, J. Hou, and P. Mohnen. 2014. *Innovation in Low Income Countries: A Survey Report.* Technology and Management Center for Development, Oxford University.

Goedhuys, M. and L. Sleuwaegen. 2013. 'The Impact of International Standards Certification on the Performance of Firms in Less Developed Countries'. *World Development* 47: 87–101.

Goedhuys, M. and M. Srholec. 2014. 'Technological Capabilities, Institutions and Firm Productivity: A Multilevel Study'. *European Journal of Development Research* 27: 122–39.

Iizuka, M., P. Mawoko, and F. Gault. 2015. 'Innovation for Development in Southern & Eastern Africa: Challenges for Promoting ST&I Policy.' *UNU-MERIT Policy Brief* No. 1-2015.

Izsak, K. and P. Markianidou. 2013. *Lessons from Ten Years of Innovation Policy: What Can Be Learnt from INNO Policy TrendChart and the Innovation Union Scoreboard.* Brussels: European Commission.

Mas, I. and D. Radcliffe. 2010. 'Mobil Payments Go Viral: M-PESA in Kenya'. *Yes Africa Can: Stories from a Dynamic Continent.* Washington, DC: World Bank. Available at http://siteresources.worldbank.org/AFRICAEXT/Resources/258643-1271798012256/M-PESA_Kenya.pdf.

OECD (Organisation for Economic Co-operation and Development). 2005. *Oslo Manual: Guidelines for Collecting and Interpreting Technological Innovation Data.* Paris: OECD Publishing.

———. 2010. *Science, Technology and Industry Outlook 2010.* Paris: OECD Publishing.

———. 2014. *Science, Technology and Innovation in Viet Nam.* Paris: OECD Publishing.

———. 2015. *Innovation Policies for Inclusive Development, Scaling up Inclusive Innovations.* Paris: OECD Publishing.

Padilla-Pérez, R. and Y. Gaudin. 2014. 'Science, Technology and Innovation Policies in Small and Developing Economies: The Case of Central America'. *Research Policy* 43: 749–59.

Safaricom. No date. M-PESA. Available at http://www.safaricom.co.ke/personal/m-pesa/.

Tijssen, R. and H. Hollanders. 2006. 'Using Science and Technology Indicators to Support Knowledge-Based Economies'. *UNU-MERIT Policy Brief* No. 11-2006.

Principles for National Innovation Success

Robert D. Atkinson and **Stephen Ezell,** Information Technology and Innovation Foundation (ITIF)

For many decades, international economists assumed that developed nations innovated and developing nations received those innovations through foreign direct investment (FDI), licensing and other forms of technology transfer, or simply by purchasing products. But now—because the ubiquitous rise of technologies such as the Internet, growing access to the world's knowledge pools, and deepening global supply chains have greatly reduced the cost of innovating—there is a growing recognition that innovation is something in which all nations can, and indeed should, be engaged.

Although few if any emerging economies can be at the global forefront of producing innovation in the most-advanced technology sectors, such as biotech and semiconductors, they can certainly engage in innovation in some specialized areas. They can also host production sites in innovation-based industries. Moreover, because innovation—as defined in the Global Innovation Index (GII) and elsewhere—is more than merely the development of advanced technology products but also involves the development of new processes and business models across all industries, all nations need to consider how they can best participate in and contribute to the global innovation economy.

But the real question is how. In fact, how to design and implement effective innovation policies in the context of lower- and middle-income economies is the theme of this edition of the GII. The many examples of global best practices for supporting innovation include everything from enabling start-up firms to register online easily with the government to implementing research and development (R&D) tax credits and supporting broadband deployment. Guiding any actions to spur innovation should be a set of innovation policy principles that nations, both developed and developing, can follow to maximize innovation advantage. This chapter presents six key principles nations need to consider, in conjunction with the lessons drawn from Chapter 3, 'Innovation Policies for Development'.

Principle 1: Innovation policy should focus on maximizing innovation in all industries

All too often when policy makers consider ways to spur innovation, their focus goes to the production of high-tech, high-value-added products. How can they open a data centre or attract a biotech firm to locate within their borders? How can they launch the next global technology company? A related but slightly more encompassing view focuses on spurring manufacturing above all else.

This focus on high-valued-added tradable goods mirrors a long tradition in international development literature of trying to grow by shifting a nation's industrial structure. A seminal 1943 paper by Rosenstein-Rodan, which argued for investment in manufacturing, set the stage for this framework when he discussed how 'unemployed workers ... are taken from the land and put into a large new shoe factory.'[1] Fifteen years later Hirschman doubled down on manufacturing with his theory of forward and backward linkages, which was largely premised on the notion of large-scale capital formation in select manufacturing industries that in turn provided linkages and other economic activities.[2] As Dasgupta and Singh explain, Cambridge economist Nicholas Kaldor built on these concepts, arguing that 'the rate of productivity growth depends on the expansion of the manufacturing sector. Expansion of the manufacturing sector will lead to more productivity growth from the manufacturing sector, which will lead to more productivity across the whole economy.'[3] If development no longer focuses on the shoe factory, it now focuses on the semiconductor factory.

Despite this tradition—and, frankly, this bias—in development literature and development practice, more recent evidence suggests that it is not the shift to high-tech production that maximizes growth in developing nations but rather it is the spurring of innovation in all

sectors, *including* traditional sectors such as farming, retail, logistics, and business services.[4] The ability to boost productivity in non-manufacturing sectors more easily through the application of information and communication technologies (ICTs) along with recognition of the increasing importance of traded services sectors has driven this new understanding. This explains why an increasingly robust body of economic literature finds that across-the-board productivity growth is actually the key driver of economic growth.[5] In other words, the productivity and innovation capacity of all of a country's sectors matter more than whether or not the nation develops a few innovation-based industries. That is why Uganda's National Science, Technology, and Innovation Plan, launched in 2012, recognizes the need to 'develop a sector-wide' approach to stimulate innovation across all sectors of Uganda's economy, including the agricultural, energy, services, and information technology sectors.[6] Likewise, Kenya envisions Konza, the Technology City of Kenya, as a hub for the development of innovative technologies empowering entrepreneurial start-ups launching innovative businesses in a range of sectors, from agriculture to mobile banking and ICT services.[7] Similarly, Ghana established its Farmer Field Fora, a participatory extension approach that leverages elements of the innovation systems perspective, which has been demonstrated to help farmers innovate.[8]

In a 2010 report, the McKinsey Global Institute provided compelling evidence that the developing nations that emphasize an across-the-board productivity and innovation approach perform best.[9] The report finds that countries that outperform their peers on productivity do not have a more 'favorable' sector mix (e.g., more high-tech industries), but instead have more productive firms overall, regardless of sector. Similarly, Kucera and Roncolato find that productivity growth across all sectors is more powerful than reallocating the mix of sectors towards those with higher productivity growth.[10] For India, for example, the authors find that within-sector effects contributed 5% and reallocation effects just 0.3% to India's average annual labour productivity growth from 1999 to 2008. That is, the growth effect accounted for 94% of all productivity growth. In short, while manufacturing generally, and high-tech manufacturing specifically, is an important component of innovation, maximizing innovation requires maximizing innovation across all industries.

Principle 2: Innovation policy should support all types and phases of innovation

To be most effective, countries' innovation activity should not only focus on all industries, it should also consider all points of the innovation value chain—in all types of innovation and along all phases of development. For the reality is that innovations can arise at many different points in the development process, including conception, R&D, transfer (the shift of the 'technology' to the production organization), and deployment or marketplace usage. Yet one of the biggest mistakes countries make with their innovation strategies is that they define innovation too narrowly, focusing mainly on developing and manufacturing high-tech products.

The Organisation for Economic Co-operation and Development (OECD) correctly notes in its *Oslo Manual* that innovation can entail a new product, process, marketing method, or organizational innovation.[11] Keely and Waters go further, arguing in their book *Ten Types of Innovation: The Discipline of Building Breakthroughs* that when it comes to business innovations there are multiple types of innovation, including network innovations, business structure innovations, service innovations, and channel innovations.[12] Their research demonstrates that firms that focus only on product innovations achieve suboptimal innovation performance. The same is true for a nation. Nations that succeed in innovation need all organizations in all industries to be able to innovate in all areas, not just new products from firms in high-tech industries. Nations also increasingly recognize that if they are to succeed 'at innovation' (especially the type of innovation that is not purely technological in nature) they need to train their CEOs, entrepreneurs, government staff, and so on in the latest tools and methods available to stimulate the development of innovative concepts and business models. Indeed, an increasing number of tools—such as the Business Model Canvas, the Autodesk Innovation Genome, and the Ten Types of Innovation—can help individuals think about innovation in a structured, systemic way, providing a resource equally valuable to policy makers and to business people.

Moreover, just as innovation is more than the development of shiny new widgets, innovation policy is more than just science policy. Innovation policy involves the same set of policy issues that countries deal with all the time, but it focuses on ways to address those issues with a view towards maximizing innovation and productivity. For example, countries can operate their government procurement practices the

same way they always have, or they can reorganize their practices in a manner specifically designed to promote innovation. Likewise, they can organize their corporate tax systems simply to raise revenues or to raise revenues in ways that also drive innovation and traded-sector competitiveness. They can set up their science policies just to support science, or they can organize their investments in scientific research in ways that also support technology commercialization and the innovation needs of industry.

The most sophisticated countries recognize this. Their innovation strategies constitute a coherent approach that seeks to coordinate disparate policies towards scientific research, technology commercialization, ICT investments, education and skills development, tax, trade, intellectual property (IP), government procurement, and regulation in an integrated fashion that drives economic growth by fostering innovation. As Finland's National Innovation Strategy argues, it is vital that a nation's innovation strategies comprehensively address a broad set of policy issues because 'piecemeal policy measures will not suffice in ensuring a nation's pioneering position in innovation activity, and thus growth in national productivity and competitive ability.'[13]

Principle 3: Enable churn and creative destruction

If innovation across all industries and parts of the innovation value chain is the key to innovation success and growth, then one critical ingredient in allowing this to happen is the embrace of churn and what noted innovation economist Schumpeter called 'creative destruction'.[14] That is, to succeed in innovation, nations need to do more than merely enable some value-added innovation to supplement what is already going on in other, leading economies. They need to enable disruptive innovation, which is often generated by new market entrants, especially those emerging in their own economies.

A key factor in enabling disruptive innovation is the presence of competitive markets. As William Lewis, the former head of the McKinsey Global Institute, has argued, perhaps no factor is more essential to driving economic growth than the presence of competitive markets. He finds that '[d]ifferences in competition in product markets are much more important [than differences in labour and capital markets]. Policies governing competition in product markets are as important as macroeconomic policies.'[15]

When countries design policies of all kinds to spur competition, this not only enables disruptive new entrants to gain market share, it also forces incumbent organizations to respond by becoming more innovative in order to survive. Countries that support competitive domestic markets create the conditions for new entrepreneurial ventures to flourish while at the same time incentivizing established firms to continue to innovate and to boost productivity. But countries that protect entrenched, incumbent, or politically favoured industries from market-based competition only damage their own country's productivity and economic growth potential.

One straightforward way countries can foster competition is to make it easier to start a new business, a process that is needlessly complex and time consuming in too many countries. In some nations it can take more than a year to start a new business. Yet the evidence clearly shows that delays caused by entry regulations are associated with lower rates of firm entry. Malaysia requires just three procedures to start a business, ranking 15th in the 2014 GII for the ease of starting a business, while Armenia ranked 6th in this indicator.

However, just as an economy needs to make it easy for businesses to start, it also needs to make it easy for them to fail or to downsize so that innovators can take their place. This means reasonable bankruptcy policies and policies enabling labour market flexibility such that talent can be deployed (or redeployed) to the most productive pursuits. Yet many nations, desperate to keep employment high, do the opposite and try to protect workers from business downsizings and closings. Paradoxically, this situation results not in worker protection, but in employers deciding that they will minimize the numbers of workers they need. As the World Bank's World Development Report 2013 notes, 'Creative destruction, the mainstay of economic growth, happens to a large extent through labor reallocation. As workers move from jobs in low-productivity firms and obsolete firms to jobs in more dynamic economic units, output increases and the economy moves closer to the efficiency frontier.'[16]

One crucial driver of competitive markets is the ability of foreign firms to compete in domestic markets, either through exports or through direct investment. Research shows that FDI can contribute significantly to regional innovation capacity and economic growth. For example, foreign R&D investments have been shown to spur local companies in the receiving country to increase their own share of R&D, leading to regional clusters of innovation-based economic activity.[17] Clearly this is not an either-or situation.

Innovation cannot thrive in nations that depend solely on either foreign or domestic enterprises alone. They need a healthy ecosystem of both.

Principle 4: Keep the price of capital goods imports, especially ICT imports, low

Innovation success is not just about coming up with good ideas. It is also about process innovation, which is enabled by investment in machinery, equipment, and software, particularly ICTs. This makes robust capital investment in machinery, equipment, and software a fundamental driver of innovation and productivity growth. Without new capital investment refreshing a nation's capital stock, innovation loses its power, productivity growth stagnates, and business competitiveness declines. Firms' investments in capital equipment are especially important because they produce spillovers that extend beyond the firm itself and benefit the broader economy. For example, van Ark finds that the spillovers from investment in new capital equipment are larger than the size of the benefits accrued by the investing firm.[18] In other words, the total benefits to society from firms investing in ICTs are twice as large as the benefits received by the investing firm.

The impact on growth from investment in some capital goods—notably ICTs—is amplified because these investments enable downstream innovations in products, processes, marketing methods, and business organization. In fact, many economists consider ICTs to be a 'general purpose technology' that delivers outsized impacts—and not just in a few industries or application areas, but across virtually all industries and applications.[19] For example, Hitt and Tambe find that the spillovers from firms' investments in information processing, equipment, and software (IPES) are 'significant and almost as large in size as the effects of their own IPES investment.'[20] This is a primary reason why ICTs generate a bigger return to productivity growth than most other forms of capital investment. It also explains why ICTs have become the global economy's greatest driver of economic growth, in developed and developing countries alike. For instance, Heshmati and Yang find that ICTs accounted for 38% of Chinese total factor productivity growth and as much as 21% of Chinese gross domestic product (GDP) growth from 1980 to 2001.[21] Updating these data in 2013, Wang and Lin find that the contribution of ICTs to Chinese GDP growth remained steady at approximately 20% from 2003 to 2007.[22] Likewise, a World Bank report finds that 'ICT has been the main driver of Kenya's economic growth over the last decade', with ICTs responsible for roughly one-quarter of Kenya's GDP growth during the 2000s.[23] As Manchester University's Richard Heeks concludes, 'ICTs will have contributed something like one-quarter of GDP growth in many developing countries during the first decade of the twenty-first century.'[24] ICTs are particularly vital in developing nations that are further from the production possibility frontier and where there is still a vast amount of low-hanging fruit that ICT investment can capture. For example, simple things such as enabling the restructuring of the retail industry so that larger, ICT-driven chains can gain more market share can play a significant role in driving productivity.

There are several ways countries can keep the cost of capital goods low. The easiest and most important is to limit tariffs and other trade barriers. A number of studies have shown that nations that impose tariffs on ICT goods to create a competitive domestic ICT industry succeed only in limiting adoption of ICTs by users (businesses and consumers) by raising prices. Nations should also be sure to not tax ICT products at a higher rate than other products. Likewise, local content requirements for capital goods and ICT goods, by definition, raise the price of ICT goods for domestic businesses and consumers. In fact, a recent Information Technology and Innovation Foundation (ITIF) report estimates yearly growth reductions to be between 0.7 percentage points and 2.3 percentage points of GDP per capita for countries with the highest tax and tariff rates on ICT products.[25]

Although many nations impose high taxes and tariffs on ICT products in an attempt to either boost government revenue or to create a competitive domestic ICT industry or both, many nations—including China, Georgia, Malaysia, and Viet Nam—do a reasonably good job of limiting government-imposed costs on ICT products. The World Trade Organization's Information Technology Agreement, chartered in 1996, has played an important role in reducing tariffs on global trade in ICT products—and contributing to increased ICT goods and services exports from the countries participating in the agreement.[26] For example, Malaysia saw its exports of ICT goods increase by more than 50% from 1996 to 2011. In contrast, developing nations that did not join the Information Technology Agreement have seen their participation in global value chains for the production of ICT products decline by over 60% since that year.[27]

More proactively, nations can ensure that their tax policies towards capital investment are favourable. Many nations have put in place or expanded tax incentives designed to spur investment, including investment in manufacturing plants and equipment. In Malaysia, for example, companies can depreciate general plant and equipment over six years, and heavy machinery over four years; they can depreciate computer and information technology (IT) equipment even faster. For corporate income tax purposes, Brazil allows 100% depreciation in the year of acquisition for new machinery, equipment, and instruments exclusively dedicated to R&D as well as 100% amortization for intangibles used in R&D.

Principle 5: Support the creation of key innovation inputs

Firms not only need access to best-in-class, affordable ICT inputs, they also need access to other key innovation inputs, including digital infrastructure, a skilled workforce, and knowledge—both its production and its transfer.

Although physical infrastructures remain important, today digital infrastructure is a crucial enabler of innovation. Digital infrastructure is about much more than the landline telephone networks of the past. Today it refers to the deployment of advanced wireless telecommunications networks and high-speed broadband networks as well as to spurring deployment of a range of ICT applications, from intelligent transportation systems and mobile payments to health IT, digital signatures, and e-government. But although effective ICT policies can spur the digital transformation of a country's economy, they require that countries coordinate policies regarding competition and regulation, R&D, universal service, and spectrum allocation, often as part of national informatization plans. For example, the Modi government in India unveiled in 2014 its Digital India programme, which—among other goals—seeks to provide high-speed Internet access to every Indian village while also enabling universal access to mobile phones.[28] Africa is the world's fastest-growing mobile market, with the fastest growth occurring in African countries whose governments have implemented proactive policies to spur the digital transformation of their societies. For example, Kenya's National ICT Master Plan 2013/14–2017/18,[29] introduced in April 2014, has played a vital role in developing a strategy to comprehensively deploy digital infrastructure, notably wireless and broadband Internet, throughout Kenya and to complement that availability of infrastructure with demand for it generated by popular applications such as mobile money and mobile government services. One result is that 93% of Kenyans are mobile phone users and 73% are mobile money customers.[30]

Providing access to quality education is fundamental to any country's long-term economic success. Countries increasingly recognize talent as a vital source of competitive advantage and thus have made education and training a core component of their innovation strategies. These countries recognize that talent has become 'the world's most sought after commodity'.[31] They know that, if a child receives an education, he or she is much more likely to get out of poverty and achieve a more prosperous future. But success in innovation requires more than broad-based, quality education; it means a serious focus on science, technology, engineering, and math (STEM) education. For example, the Jordan Education Initiative seeks to enable Jordanian students to compete in the global knowledge economy in large part by focusing on STEM education, training teachers and administrators to use technology in the classroom, and guiding students through critical thinking and analysis.[32]

Ideally the focus of countries' strategies for educating their citizens should be broader than STEM to encompass STEEM (with the second 'E' standing for entrepreneurship). Policy makers around the world have increasingly come to realize that entrepreneurship, particularly high-growth entrepreneurship, is critical for economic development. Public policy can play a central role in supporting this entrepreneurship. One place to start is with entrepreneurial education (this is a central focus of innovation policy in Uganda, for example), because entrepreneurship is more than just talent and knowledge. Some nations have both in ample supply, but they lag in entrepreneurship, in part because of culture, but also in part because they do not do enough to teach and support entrepreneurship. Governments should support entrepreneurship education at both the high school and college levels. In addition, governments can help provide entrepreneurial 'infrastructure' such as accelerators—organizations that provide space for entrepreneurs and linkages to mentors and potential customers. This is why the United Nations Children's Fund (UNICEF) created a global network of innovation labs that act as accelerators that bring businesses, universities, governments, and civil society together to create sustainable solutions to the most pressing challenges facing children and youth.[33] The lab model creates opportunities for young people, who have a unique insight into the

challenges that affect their communities, and helps them team up with local leaders to develop creative and sustainable solutions to the problems they identify as a priority.

These kinds of support and intermediary organizations also can play a critical role in vetting and giving entrepreneurs a seal of approval, making it easier for a high-growth entrepreneur to make a pitch for their business or product to angel investors and customers. Yet it is very hard for potential investors or customers to know whether they are dealing with someone who has the next big thing or simply a person with an interesting, but not marketable, idea. For this reason, one role of innovation incubators such as the 1776 global incubator located in Washington, DC, is to evaluate entrepreneurs and show a portfolio of similar start-ups to bigger 'buyers'.[34]

Because entrepreneurship is so risky and often involves first-time entrepreneurs, initiatives to help entrepreneurs learn from each other can be critical. Hence the proposal for a global entrepreneurship corps—where leaders from other sectors bring capital, ideas, and mentorship and meet in specific cities where there is limited access to such talent and resources—may play an important role. In addition, setting up a web-based global entrepreneurship mentorship programme whereby mentors in developed nations can help budding entrepreneurs in developing nations, perhaps through Internet telephony tools, can also be a valuable tool.

In addition, a country's science and R&D policies are crucial determinants of its economic vitality. Relevant policies here include robust and growing public funding for R&D, ensuring that businesses have incentives to invest in R&D, and implementing policies that enable a nation's organizations to adopt newer and better technologies than are currently in use. Underlying these policies is the fact that, without them, the level of innovation in an economy is almost always suboptimal from a societal perspective. Indeed, the significant spillover benefits from innovation mean that, even under 'perfect' market conditions, the private sector will underinvest in the factors that underpin innovation, including R&D.

Because small and medium-sized enterprises (SMEs) account for such a large share of enterprises in many developing countries, it is important that nations implement programmes to help those SMEs boost their productivity and innovation capacity. For example, India's Ministry of Micro, Small, & Medium Enterprises (MSME) aims to strengthen the science and technology potential of Indian MSMEs in semi-urban and rural areas, offering various awards and incentives to encourage entrepreneurship, cluster networking, and support to target groups—initiatives conceptually on par with efforts to support manufacturing SMEs in Western countries.[35] Likewise, a number of Latin American and Caribbean countries have launched programmes or ministries, such as Chile's SERCOTEC and Mexico's SPYME (Sub-Secretariat of the Small and Medium Enterprise), that seek to support growth and innovation among their small enterprises and manufacturers.[36]

Finally, nations need an infrastructure for technology transfer and diffusion to compound the return on their domestic innovation investments. Obtaining the full benefits of public support for research relies on the effective transfer of knowledge from the university and government lab to the private sector so it can be developed into marketable innovations. A range of policies can help spur the commercialization of research, but one indispensable policy enables vesting the IP rights of government-funded research with the university or research institution, as a wide range of economies—including Brazil, China, Indonesia, Malaysia, the Philippines, the Russian Federation, Singapore, South Africa, the Republic of Korea, and the United States of America—have done.[37]

An increasing number of nations are using innovation vouchers to spur innovation. These low-cost grants, typically US$5,000 to US$10,000, connect start-ups with public research institutes to incentivize R&D among young, innovative firms. The goals of these vouchers include enabling knowledge transfers between start-ups and research institutes/universities, supporting sectoral innovation in manufacturing, supporting innovation management and advisory services, speeding commercialization of start-up ideas, and focusing research institutions on the commercial applications of their research. India and Moldova—two of the eleven outperformer countries identified in the GII 2014—are among the almost two dozen nations (including many larger ones such as Austria, Canada, Croatia, England, Ireland, and the Netherlands) that have found success using innovation vouchers.

Principle 6: Develop a national innovation and productivity strategy and organizations to support it

Although innovation is largely driven by entrepreneurs and the private sector, government action (as described above) can play a strategic supportive role. That role can be optimized if nations develop well-designed national innovation and productivity strategies.

For example, in 2010, India established a National Innovation Council to define a new roadmap for research and innovation along with a Science and Engineering Research Board to act as a funding agency. In 2013, the Government of India published a new Science, Technology, and Innovation (STI) Policy Statement, which recognized that 'India has hitherto not accorded due importance to innovation as an instrument of policy,' and resolved to develop 'a New Paradigm of STI for the people.'[38] The plan focuses on the integration of science, technology, and innovation to create social good and economic wealth, recognizing Indian society as a major stakeholder. Although those policies were launched by the previous Singh administration, new Prime Minister Narendra Modi has built on them with a focus on entrepreneurship, notably by launching a new Ministry for Skill Development and Entrepreneurship.[39] The STI Policy Statement declared its goal to raise India's national R&D intensity (R&D as a share of GDP) from the 0.85% level of today to 2% by 2020. In another example of a national strategy addressing innovation, in 2010, the Government of Ghana released its National Science, Technology and Innovation Policy.[40] Over fifty nations have now developed national innovation strategies.[41]

In addition to national strategies, many successful nations have also established national innovation agencies specifically dedicated to spurring domestic innovation. For example, Kenya, India, Malaysia, Thailand, and Viet Nam have each established a National Innovation Agency. Many of these are relatively new institutions. For instance, Kenya launched the Kenya National Innovation Agency in 2013 and Malaysia founded its Agensi Inovasi Malaysia in 2010, although Thailand's National Innovation Agency dates back to 2003. Among other tasks, these agencies work to promote absorptive capacity and help firms—especially manufacturers and SMEs—increase productivity by adopting best processes and technologies, training firms and entrepreneurs in innovation skills and competencies, promoting knowledge/technology transfer from universities and labs to the private sector, and helping link domestic firms into global supply chains.

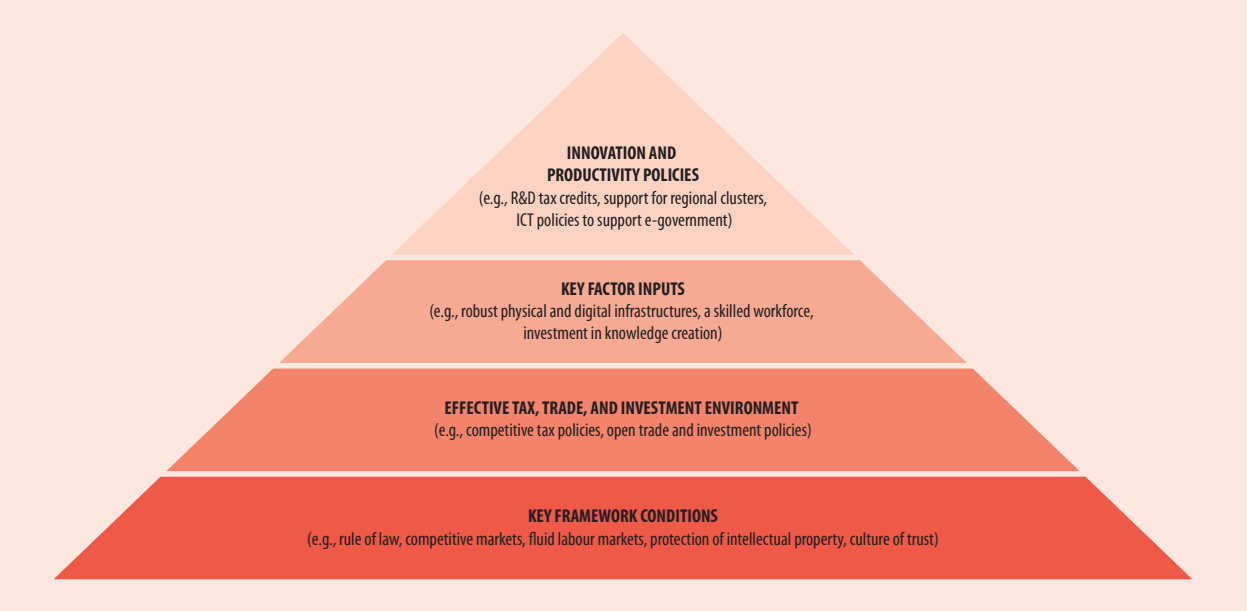
National innovation foundations also create national innovation strategies that constitute a game plan for how their countries can compete and win in a modern, innovation-based global economy. For instance, Kenya's National Science, Technology and Innovation Policy underscores the importance of mainstreaming science, technology, and innovation across all sectors of the economy. Uganda authored its first National Science, Technology, and Innovation Plan in 2011.[42] Armenia, China, India, Malaysia, Moldova, Mongolia, Thailand, and Viet Nam also have articulated similar national innovation strategies. Strengthening the intellectual property regimes that underpin innovation economies has been a core focus of the innovation strategies of many such countries, including notably in Jordan and Mongolia. For instance, Mongolia devotes an entire chapter of the *Science & Technology Master Plan of Mongolia 2007–2020* to 'Improving the system of protecting and utilizing intellectual property rights.'[43] India recently released a Draft National IPR policy and set up an IP think tank within its Department of Industrial Policy and Promotion.[44] And researchers in Jordan have connected the country's stronger embrace of IP rights in the 1990s with increases in GDP, inbound FDI, and decreased reliance on foreign aid.[45]

Conclusions

Countries attempting to achieve national innovation success need to envision a four-level pyramid as the path to prosperity (see Figure 1 on the following page). At the base level are key framework conditions such as the rule of law, ease of doing business, competitive markets, flexible labour markets, the effective protection of property (including intellectual property), and a culture of trust—topics addressed in Principles 1 through 3 of this chapter. Without these key framework conditions, even the most sophisticated innovation and industrial policies will not succeed. The next level includes an effective tax, trade, and investment environment. Key considerations here include establishing a globally competitive tax environment and implementing policies that encourage trade and FDI. Countries best succeed at attracting FDI when they use an attraction strategy, not a compulsion strategy, and welcome but not force investment in their nations.

After these factors are in place, nations need to focus on supporting the kinds of external factors firms need to succeed. These include robust physical and digital infrastructures; a skilled workforce with broad-based general capabilities as well as the specialized skills matching needs of key industries; and robust knowledge creation (e.g., investment in science and technology), as discussed in Principles 4 and 5. But even these are not enough. Indeed, with more nations realizing that mastery of these three levels is needed just to be in the game, success requires going to a fourth level that includes effectively crafted innovation and productivity policies specifically

Figure 1: Projected population: Uganda, 2015–25



Source: Based on Ezell et al., 2013, p. 58.

tailored to a country's competitive strengths and weaknesses. As discussed in Principles 4 and 6, policies here include provisions such as R&D tax incentives, support for regional innovation clusters, and support for innovative small businesses.

To be clear, these are not sequential in a temporal sense, but rather reflect the fact that even the most sophisticated innovation policies will not produce the desired results if they are not based on a strong foundation of key framework conditions; an effective tax, trade, and investment environment; and the presence of key factor inputs. Yet nations often focus on the top of the pyramid because these are often the easiest to implement politically (establishing a programme to develop a regional innovation cluster seldom faces opposition), while some of the policies at the base of the pyramid are much more difficult to achieve politically because change challenges entrenched interests in government or the private sector.

In conclusion, innovation policy—the constellation of government policies from tax, to trade, to talent, to technology that support a nation's innovation ecosystem—has become the single most important factor nations need to get right if they are to thrive in the globally competitive economy.[46] Countries must think holistically about how a wide variety of public policies impact the ability of their enterprises and industries to compete in the increasingly innovation-based global economy. Although this represents no easy task, the benefits to countries that get these policies right can be tremendous. Serious efforts at implementing policies that address the needs of innovation across all sectors and at all levels will certainly pay off over the long term—and probably much sooner.

Notes

1 Rosenstein-Rodan, 1943.

2 Hirschman, 1988.

3 Dasgupta and Singh, 2006, p. 9.

4 Ezell and Atkinson, 2010.

5 McKinsey Global Institute, 2010.

6 Ministry of Finance Planning and Economic Development (Uganda), 2011, p. 23.

7 Konza Techno City Kenya, 'Master Plan', available at http://www.konzacity.go.ke/the-vision/master-plan/.

8 Opare-Atakora et al., 2014.

9 McKinsey Global Institute, 2010.

10 Kucera and Roncolato, 2012.

11 OECD, 2005; for the OECD's definition of 'innovation', see also http://www.oecd.org/site/innovationstrategy/defininginnovation.htm.

12 Keeley and Waters, 2013.

13 Ministry of Employment and the Economy (Finland), 2009, p. 20.

14 Schumpeter, 1975, pp. 82-85.

15 Lewis, 2005.

16 World Bank, 2013, p. 313.

17 Atkinson et al., 2012, p. 35–6.

18 van Ark, 2002.

19 Atkinson and McKay, 2007.

20 Hitt and Tambe, 2006, p. 1797.

21 Heshmati and Yang, 2006, p. 15.

22 Wang and Lin, 2013.

23 World Bank, 2010, p. 3.

24 Heeks, 2011.

25 Miller and Atkinson, 2014.

26 Ezell, 2012.

27 OECD, 2013.

28 For details about the Digital India programme, see http://deity.gov.in/sites/upload_files/dit/files/Digital%20India.pdf.

29 For details about Kenya's *National ICT Masterplan 2013/14–2017/18,* see https://www.kenet.or.ke/sites/default/files/Final%20ICT%20Masterplan%20Apr%202014.pdf.

30 Demombynes and Thegeya, 2012, p. 2.

31 Atkinson et al., 2012, p. 117.

32 Jordan Education Initiative, available at http://www.jei.org.jo/.

33 Details about UNICEF's innovation labs can be found at http://www.unicef.org/innovation/innovation_73201.html.

34 For details about the 1776 incubator, see http://www.1776.vc/.

35 For details about India's MSME ministry, see http://msme.gov.in/mob/home.aspx.

36 Andes et al. 2013.

37 Atkinson et al., 2012, p. 46.

38 Ministry of Science and Technology (India), 2013, p. 2.

39 Borpuzari, 2014.

40 Ministry of Environment, Science and Technology (Ghana), 2010.

41 Ezell et al., 2015.

42 Ministry of Finance Planning and Economic Development (Uganda), 2011.

43 UNESCO, 2007.

44 Sridevan et al. 2014.

45 Cepeda et al., 2010, p. 11.

46 Atkinson and Ezell, 2012, p. 10.

References

1776. 'About Us.' Available at http://www.1776.vc/about/.

Andes, S., S. J. Ezell, and J. Leal. 2013. *An Alternative to Mercantilism: Manufacturing Extension Services in Latin American and Caribbean Countries.* Washington, DC: ITIF. Available at http://www2.itif.org/2013-manufacturing-extension-services-latin-america-caribbean.pdf.

Atkinson, R. D. and S. J. Ezell. 2012. *Innovation Economics: The Race for Global Advantage.* New Haven, CT: Yale University Press.

Atkinson, R. D., S. J. Ezell, and L. A. Stewart. 2012. *The Global Innovation Policy Index.* Washington, DC: ITIF. Available at http://www2.itif.org/2012-global-innovation-policy-index.pdf.

Atkinson, R. D. and A. McKay. 2007. *Digital Prosperity: Understanding the Economic Benefits of the Information Technology Revolution,* March. Washington, DC: ITIF. Available at http://www.itif.org/files/digital_prosperity.pdf.

Borpuzari, P. 2014. 'Narendra Modi Appoints Sarbananda Sonowal Minister for Skill Development, Entrepreneurship'. *The Economic Times,* 27 May. Available at http://articles.economictimes.indiatimes.com/2014-05-27/news/50122840_1_national-skill-development-agency-entrepreneurship-sam-pitroda.

Cepeda, R. C., D. C. Lippoldt, and J. Senft. 2010. 'Policy Complements to the Strengthening of IPRS in Developing Countries'. *OECD Trade Policy Papers* No. 104. Available at http://dx.doi.org/10.1787/5km7fmwz85d4-en.

Dasgupta, S. and A. Singh. 2006. 'Manufacturing, Services and Premature Deindustrialization in Developing Countries: A Kaldorian Analysis'. *UNU-WIDER Research Paper* No. 2006/49, UNU-WIDER, United Nations University, May. Available at http://www.rrojasdatabank.info/rp2006-49.pdf.

Demombynes G. and A. Thegeya. 2012. 'Kenya's Mobile Revolution and the Promise of Mobile Savings'. *World Bank Policy Research Paper* No. 5988. Available at http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-5988.

Department of Electronics and Information Technology (DEITY) (India). 2015. 'Digital India'. DEITY, January. Available at pib.nic.in/archieve/others/2014/aug/d2014082010.pptx.

Ezell, S. J. 2012. 'The Benefits of ITA Expansion for Developing Countries', December. Washington, DC: ITIF. Available at http://www2.itif.org/2012-benefits-ita-developing-countries.pdf.

Ezell, S. J. and R. D. Atkinson. 2010. *The Good, the Bad, and the Ugly (and the Self Destructive) of Innovation Policy,* October. Washington, DC: ITIF. Available at http://www.itif.org/files/2010-good-bad-ugly.pdf.

Ezell, S. J., R. D. Atkinson, and M. A. Wein. 2013. *Localization Barriers to Trade: Threat to the Global Innovation Economy.* Washington, DC: ITIF. Available at http://www2.itif.org/2013-localization-barriers-to-trade.pdf?_ga=1.70791632.1998667003.1421519660.

Ezell, S. J., F. Spring, and K. Bitka. 2015. 'The Global Flourishing of National Innovation Foundations', April. Washington, DC: ITIF. Available at http://www2.itif.org/2015-flourishing-national-innovation.pdf?_ga=1.38223331.1998667003.1421519660.

Heeks, R. 2011. 'ICT and Economic Growth: Evidence from Kenya'. *ICTs for Development* (blog), 16 June. Available at http://ict4dblog.wordpress.com/2011/06/26/ict-and-economic-growth-evidence-from-kenya/.

Heshmati, A. and W. Yang. 2006. 'Contribution of ICT to the Chinese Economic Growth'. RATIO Institute and Techno-Economics and Policy Program, College of Engineering, Seoul National University. Available at https://docs.google.com/file/d/1oFItzryXSMXs2UYqYRRRBDONuD4O77q9CyeTB6tYh0T-C93xfDWnHfd1YbZH/edit?hl=en_US.

Hirschman, A. O. 1988. *The Strategy of Economic Development.* Boulder, CO: Westview Press.

Hitt L. and P.Tambe. 2006. 'Measuring Spillovers from Information Technology Investments.' *ICIS 2006 Proceedings.* Paper 108. Available at http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1229&context=icis2006.

ICT Authority (Kenya). 2014. *The Kenya National ICT Masterplan 2013/2014-2017/2018.* Available at https://www.kenet.or.ke/sites/default/files/Final%20ICT%20Masterplan%20Apr%202014.pdf.

Jordan Education Initiative. 'About Us'. Available at http://www.jei.org.jo/.

Keeley, L. and H. Waters. 2013. *Ten Types of Innovation: The Discipline of Building Breakthroughs.* Hoboken, NJ: Wiley.

Konza Techno City Kenya. 'Master Plan'. Available at http://www.konzacity.go.ke/the-vision/master-plan/.

Kucera, D. and L. Roncolato. 2012. 'Structure Matters: Sectoral Drivers of Growth and the Labour Productivity-Employment Relationship'. *International Labour Office Research Paper* No. 3. Geneva: ILO. Available at http://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_195178.pdf.

Lewis, W. 2005. *The Power of Productivity.* Chicago, IL: University of Chicago Press.

McKinsey Global Institute. 2010. 'How to Compete and Grow: A Sector Guide to Policy', March. McKinsey Global Institute. Available at http://www.mckinsey.com/insights/economic_studies/how_to_compete_and_grow.

Miller, B. and R. D. Atkinson. 2014. 'Digital Drag: Ranking 125 Nations on Taxes and Tariffs on ICT Goods and Services', October. Washington, DC: ITIF. Available at http://www2.itif.org/2014-ict-taxes-tariffs.pdf?_ga=1.267915598.1998667003.1421519660.

Ministry of Employment and the Economy (Finland). 2009. 'Government's Communication on Finland's National Innovation Strategy to the Parliament', March. Finnish Ministry of Employment and the Economy, March 2009. Available at http://www.tem.fi/files/21010/National_Innovation_Strategy_March_2009.pdf.

Ministry of Environment, Science and Technology (Ghana). 2010. 'National Science, Technology, and Innovation Policy'. Available at http://chet.org.za/manual/media/files/chet_hernana_docs/Ghana/National/Ghana%20S%20and%20T%20policy%202010.pdf.

Ministry of Finance Planning and Economic Development (Uganda). 2011. *National Science, Technology, and Innovation Plan 2012/2013–2017/2018.* Available at http://workspace.unpan.org/sites/internet/documents/unpan048881.pdf.

Ministry of Science and Technology (India). 2013. *Science, Technology, and Innovation Policy 2013.* Available at http://dst.gov.in/sti-policy-eng.pdf.

OECD (Organisation for Economic Co-operation and Development). 2005. *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition.* Geneva: OECD.

———. 2013. 'Implications of Global Value Chains for Trade, Investment, Development, and Jobs', 6 August. Paper prepared for the G-20 Leaders Summit, Saint Petersburg (Russian Federation), September 2013. Available at http://www.oecd.org/sti/ind/G20-Global-Value-Chains-2013.pdf.

Opare-Atakora, D., S. Donkoh, and A. Alhassan. 2014. 'Farmer Field Fora and Adoption of Yam Integrated Pest and Disease Management Technologies in Northern Ghana'. *Journal of Agricultural Extension and Rural Development* 6 (5): 143–52.

Rosenstein-Rodan, P. N. 1943. 'Problems of Industrialization of Eastern and South-Eastern Europe'. *The Economic Journal* 53 (June–September, 1943): 202–11. Available at http://www.econ.nyu.edu/user/debraj/Courses/Readings/RosensteinRodan.pdf.

Schumpeter, J. 1975. *Capitalism, Socialism and Democracy.* New York: Harper.

Sridevan, Justice P., P. M. Singh, N. K. Sabharwal, P. Bhargava, R. Srinivasan, and U. Pandit. 2014. *National IPR Policy, First Draft.* Indian Department of Industrial Policy and Promotion, 19 December. Available at http://dipp.nic.in/English/Schemes/Intellectual_Property_Rights/IPR_Policy_24December2014.pdf.

UNESCO (United Nations Educational, Scientific and Cultural Organization). 2007. *Science & Technology Master Plan of Mongolia 2007–2020.* Ulaanbaator, Mongolia: UNESCO Science Policy Studies. Available at http://unesdoc.unesco.org/images/0015/001514/151490E.pdf.

van Ark, B. 2002. 'Measuring the New Economy: An International Comparative Perspective'. *Review of Income and Wealth* 48 (2002): 1–14.

Wang, C. C. and G. C. S. Lin. 2013. 'Dynamics of Innovation in a Globalizing China: Regional Environment, Inter-Firm Relations and Firm Attributes'. *Journal of Economic Geography* 13 (3): 397–418. Available at http://joeg.oxfordjournals.org/content/early/2012/07/28/jeg.lbs019.abstract.

World Bank. 2013. *World Development Report 2013: Jobs.* Washington, DC: International Bank for Reconstruction and Development/World Bank. Available at http://siteresources.worldbank.org/EXTNWDR2013/Resources/8258024-1320950747192/8260293-1322665883147/WDR_2013_Report.pdf.

World Bank, Poverty Reduction and Economic Management Unit Africa Region. 2010. *Kenya Economic Update. December 2010, Edition 3.* Nairobi, Kenya: World Bank. Available at http://siteresources.worldbank.org/KENYAEXTN/Resources/KEU-Dec_2010_with_cover_e-version.pdf.

Innovation and Policy: A Business Perspective

Kai Engel and **Justin Shepherd**, A.T. Kearney

Martin Ruppert, IMP³rove – European Innovation Management Academy

To provide a business perspective on innovation policies in the focus countries of this year's Global Innovation Index (GII), a survey of over 400 business leaders across several different countries was conducted by A.T. Kearney and IMP³rove – European Innovation Management Academy to gain a bottom-up perspective on innovation policy and to serve as a complement to the overall GII. This chapter presents the results of that survey.

Study methodology

In order to elicit an understanding of the framework conditions needed for innovation and to determine key aspects of policy that would enhance the innovation environment, the survey was composed of three thematic pillars:

- the identification of current challenges faced by companies in managing innovation;
- the receipt of feedback from business representatives about how they perceive framework conditions for innovation in their countries; and
- the synthesis of a business perspective on the implications for innovation policies.

More than 400 innovation experts and leaders of large companies participated to provide a bottom-up perspective on innovation policies. The survey analysed the perspective of large corporations in order to receive feedback from those firms with a strong international representation; this international perspective enabled them to compare framework conditions for innovation in different countries. The survey addressed innovation experts or business leaders of these companies to receive direct feedback from those affected by innovation policies.

Company representatives were located in four focus countries—Malaysia, India, Singapore, and Turkey—that were selected based on their placement in the GII report. Malaysia and India are representatives of 'innovation outperformer' developing countries that, as a result of their strong performance in the seven pillars of the GII, have been chosen as countries central to this year's analytical chapters. Singapore was selected as a top-20 country of the GII 2014 and is geographic neighbour of Malaysia. Turkey was selected for comparison because it is a newly industrialized country.

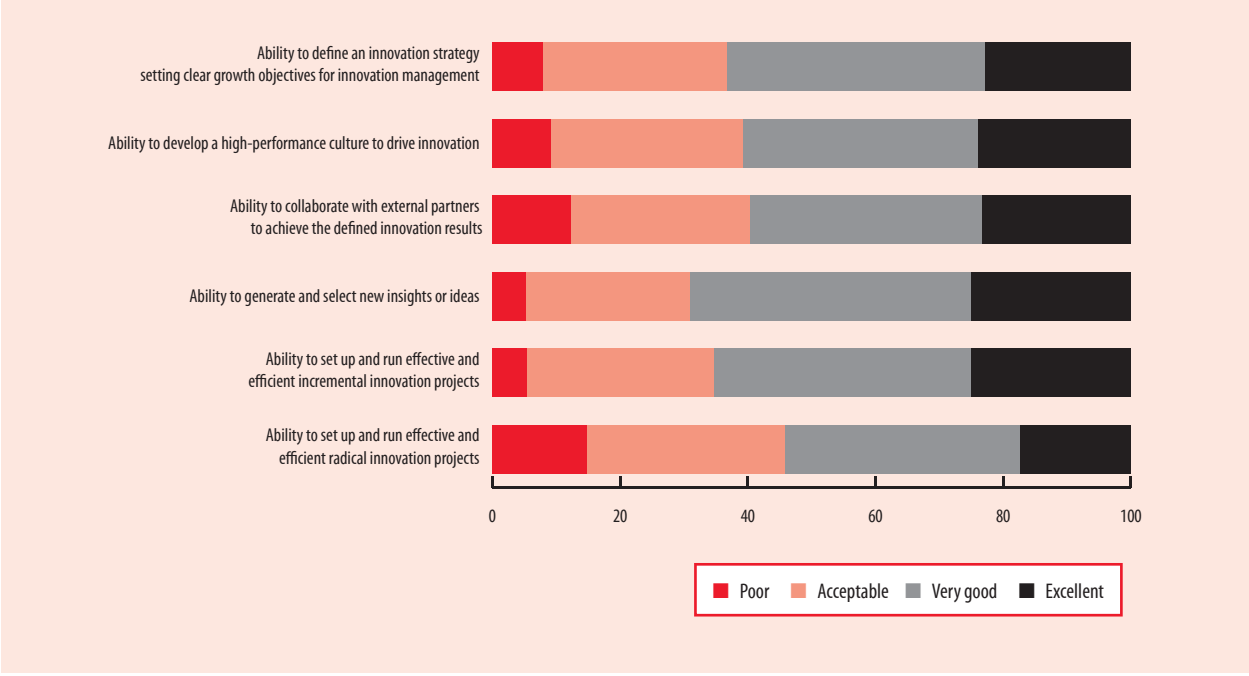
In addition, and with particular focus on qualitative feedback, a small sample of evidence from Germany and Poland serves to provide a comparison to the situation in the European Union, and results from the United Arab Emirates provide a perspective from the Middle East. Key findings from all countries are provided in Box 1.

Box 1: Key findings

The survey's findings fall into two general categories: areas where innovation is considered to be well supported and areas of concern. The list below summarizes these findings.

- Surveyed companies were confident about their own innovation capacities; over half of those surveyed rated their performance as 'excellent' or 'very good' across all areas.
- Delivering radical innovation and collaborating with external partners were the two areas where companies saw the greatest need for improvement.
- Eighty percent of survey respondents said that conditions in their countries enable them to pursue strategic objectives for innovation.
- However, respondents highlighted policy concerns in three areas: forward-thinking legislation to support future markets, the predictability of regulation, and the harmonization of international regulation.
- More than 60% of survey respondents consider policy measures to be 'important' or 'highly important' to support innovation.
- Respondents suggested that the innovation environment could be improved by policies aimed at enhancing innovation and entrepreneurship-related skills, providing large R&D infrastructure support (e.g., lab space and equipment), and providing direct financial support.

Figure 1: Self-assessment of innovation capability



Source: A.T. Kearney and IMP³rove – European Innovation Management Academy Survey.
Note: The figure depicts responses to the survey question 'How would you rate your company's ability to …'

Key innovation management challenges: Company self-assessments

Managers were generally positive when evaluating their own innovation capabilities. However, they identified the ability to deliver radical innovation and the ability to collaborate with external partners as those areas most in need of improvement.[1]

Respondents were asked to rate their companies in several crucial aspects of leading innovation management, including the ability to:

- define an innovation strategy that sets clear growth objectives for innovation management,
- develop a high-performance culture to drive innovation,
- collaborate with external partners to achieve the defined innovation results,
- generate and select new insights or ideas,
- set up and run effective and efficient incremental innovation projects, and
- set up and run effective and efficient radical innovation projects.

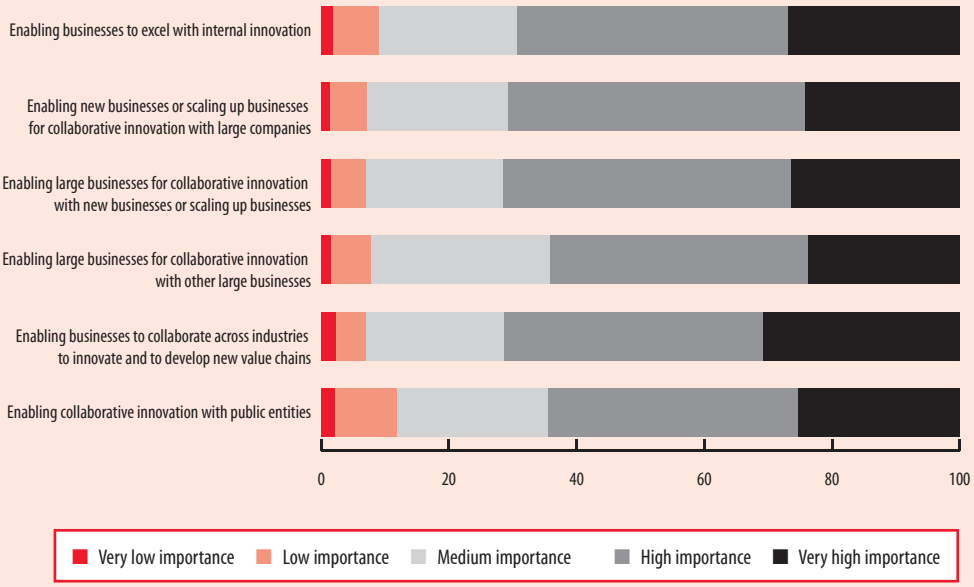
Figure 1 summarizes the results of the self-assessments. On the positive side, more than 50% of large company representatives rated their firms as either 'very good' or 'excellent' in each of the categories. Companies viewed themselves most critically with regard to their ability to set up and run effective and efficient radical innovation projects. This ability was rated as 'poor' by 15% of respondents. The second challenge identified by respondents was the ability to collaborate with external partners to achieve the defined innovation results; 12% of all participants rated this ability as 'poor'. Participating companies provided comparable self-assessments with regard to the ability to develop a high-performance culture to drive innovation (9% rated this as 'poor') and with regard to the ability to define an innovation strategy (8% said 'poor'). The least serious problems were seen as the ability to generate and select new insights or ideas (5% rated this issue as 'poor') and the ability to set up and run effective and efficient incremental innovation projects (5% rated as 'poor').

Feedback from businesses: Framework conditions for innovation

Of the survey respondents, 80% answered that conditions in their countries permit them to pursue strategic objectives for innovation. This outcome suggests that policy environments are currently broadly supportive of innovation.

However, the responses also reflected the need for policy makers to maintain a forward-looking orientation and to create policy frameworks that will support innovation in the future, not only in the

Figure 2: The importance of policy measures



Source: A.T. Kearney and IMP³rove – European Innovation Management Academy Survey.
Note: This figure shows responses to the survey question 'How important are policy measures to support the following innovation models?'

present. When asked about future policy needs to support innovation, survey participants had a number of suggestions. These included:

- **Adopting forward-thinking legislation.** Developing adequate supporting legislation for emerging technologies prior to their entry into the market (e.g., supporting legal and regulatory infrastructure for autonomous cars) will be an important step in ensuring that the innovation environment is sustainable.
- **Enabling anticipation of regulation.** Providing market participants with the tools to effectively plan on a mid- to long-term basis with regard to regulatory considerations, and to ensure transparency in regulatory processes and changes so that companies can calibrate business innovations appropriately and reduce risk in long-term investments (e.g., in the area of policy supports for renewable energy) will be vital to ensuring that the business community remains supported and has the confidence to make innovation investments.
- **Improving regulatory harmonization.** Providing consistent classifications, restrictions, terminology, and supports across different geographies and jurisdictions—including cross-border harmonization so that, for example, comparable standards are provided and upheld in the area of heating, ventilation, and air conditioning in various countries—will be essential to ensuring the smooth implementation of the results of innovation into the marketplace. Moreover, regulatory harmonization will reduce the investment requirements needed to address a given market potential with an innovation.

Business perspectives: Implications for innovation policies

More than 60% of survey respondents consider policy measures to be important or highly important to support different models of internal or collaborative innovation (Figure 2).

As Figure 2 illustrates, 69% of survey respondents see policy measures to support internal innovation models as having either 'high' or 'very high' importance. By generating an increasingly complex innovation environment, current mega trends—such as digitization and connectivity—will make policy supports even more vital. This is particularly true in the area of collaborative innovation—for example, collaboration between large corporations with market access and appropriate resources and entrepreneurs who lack either access or resources but have innovative ideas in need of development.

Overall, 71% of survey respondents saw high or very high importance in policy measures intended to enable new businesses or to scale up current operations to collaborate with large, established businesses in innovation—and vice versa.[2] Of the survey respondents, 72% consider enabling businesses to collaborate across industries to innovate and develop new value chains to be important or highly important. Both the importance of policies that enable collaborative innovation between large businesses and the importance of enabling collaborative innovation with public entities were highlighted by 64% of survey respondents.

Survey participants were further asked to name up to three specific actions that would develop enhanced conditions for innovation in their country (Table 1).

The highest priorities identified by the group were:

1. to enhance innovation and entrepreneurship-related skills,
2. to provide large R&D infrastructure support (e.g., lab space and equipment), and
3. to provide direct financial R&D support.

These priorities reflect the findings of the GII 2014, which indicated room for improvement in Human capital and Market sophistication–related factors such as access to finance, innovation linkages, and infrastructure (see Table 2 for an overview).

Business representatives see three priorities for policies to foster *collaborative* innovation: to support investment, to enhance education (on the level of both personal skills and firm competency), and to strengthen innovation linkages.

In the specific area of collaborative innovation, over 60% of respondents from Singapore, Malaysia, and India and over 40% from Turkey highlighted the role of policies needed to support investment in research and technologies (Table 3). Education and skill needs, however, were rated nearly as high as

Table 1: Top three priorities for innovation, by focus country

	1st priority	Percent of answers	2nd priority	Percent of answers	3rd priority	Percent of answers
India	Provide large R&D infrastructure support (for example, lab space and equipment)	25	Improve ICT infrastructure	22	Provide direct financial R&D support	22
Malaysia	Provide large R&D infrastructure support (for example, lab space and equipment)	33	Enhance innovation and entrepreneurship-related skills and education	28	Improve ICT infrastructure	27
Singapore	Provide direct financial R&D support	34	Provide innovation support services	25	Develop measures to lower factor cost	21
Turkey	Enhance innovation and entrepreneurship-related skills and education	41	Provide direct financial R&D support	40	Enhance political stability	32

Source: A.T. Kearney and IMP³rove – European Innovation Management Academy Survey.
Note: These data are the results of the survey question 'Which (up to three) specific actions by policy makers or business representatives would be most important for developing enhanced conditions for innovation in your country?'

Table 2: Global Innovation Index 2014 scores: Comparison of focus countries

	Score			
GII pillar or sub-pillar	India	Malaysia	Singapore	Turkey
Institutions	50.8	68.2	92.8	54.9
Human capital & research	22.7	41.6	64.9	33.3
Infrastructure	32.1	45.7	65.6	35.6
Market sophistication	51.2	63.9	78.2	49.1
Business sophistication	28.0	42.9	66.7	25.4
Knowledge workers	25.0	48.1	76.4	34.4
Innovation linkages	38.9	33.8	51.5	25.1
Knowledge absorption	20.2	46.8	72.1	16.8
Knowledge and technology outputs	32.2	35.5	46.7	32.3
Creative outputs	28.6	42.0	43.1	41.2

Source: GII, 2014.

Table 3: Priority policy areas for collaborative innovation, percent of answers by focus country

	Policy intention				
Country	To support investment in research and technologies (%)	To enhance skills for innovation (%)	To enhance innovation competencies of firms (%)	To strengthen linkages within innovation networks (%)	To enhance demand and framework conditions for innovation (%)
India	63	51	63	55	28
Malaysia	67	63	47	52	29
Singapore	68	57	62	51	35
Turkey	44	34	30	20	18

Source: A.T. Kearney and IMP³rove – European Innovation Management Academy Survey.
Note: The table presents answers to the survey question 'Which policy instruments should policy makers focus on to foster collaborative innovation?'

financing needs by participants. Policies to enhance skills for innovation (including personal skills developed through education) and the competencies of firms were selected as a priority area. Reflecting the important challenge of identifying and selecting appropriate partners in innovation, the role of policies to strengthen linkages within innovation networks was also noted as being crucial.

Conclusion

A recent study has shown that business representatives not only acknowledge the importance of innovation management, but they expect its significance to increase in the future.[3] As the results of this survey with more than 400 business representatives indicate, policy makers play an important role as enablers for innovation management of their businesses. Importantly, enabling innovation not only includes providing funding but also developing framework conditions that can enable businesses to excel in and beyond their home country.

A business perspective clearly demonstrates the essential role that innovation plays for business. But it plays an essential role for the overall economic development of countries as well—and, of course, it is a virtuous circle: A growing economy is good for business. Encouraging policy that supports the development of an environment in which innovation can thrive should be a focus of efforts from the business community.

Notes

1 Radical innovations result in totally new products, services, processes, organizations, or business models. Incremental innovations lead to improvements to existing products, services, process, organizations, or business models.

2 For a detailed analysis of collaborative innovation between large corporations and entrepreneurs, see the World Economic Forum, 2015, forthcoming.

3 IMP³rove – European Innovation Management Academy, 2015.

References

Cornell University, INSEAD, and WIPO. 2014. *The Global Innovation Index 2014: The Human Factor in Innovation,* eds. S. Dutta, B. Lanvin, and S. Wunsch-Vincent. Ithaca, Fontainebleau, and Geneva: Cornell, INSEAD, and WIPO.

IMP³rove – European Innovation Management Academy. 2015. *Overview on the IMP³rove Benchmarking Database and the IMP³rove Consultant Network.* IMP³rove Update. Available at www.improve-innovation.eu/wp-content/uploads/2015/07/IMP³rove-Update-May-2015.pdf.

World Economic Forum. 2014. *Enhancing Europe's Competitiveness: Fostering Innovation-Driven Entrepreneurship in Europe.* Insight Report, in collaboration with A.T. Kearney. Geneva: World Economic Forum.

———. 2015, forthcoming. *Collaborative Innovation: Transforming Business, Driving Growth.* Project in collaboration with A.T. Kearney and the IMP³rove – European Innovation Management Academy. Available at http://www.weforum.org/projects/collaborative-innovation-transforming-business-driving-growth.

The Impact of Science and Technology Policies on Rapid Economic Development in China

Dongmin Chen, Shilin Zheng, and **Lei Guo,** Peking University

Thirty years of ongoing economic reforms in China has led to an uninterrupted annual economic growth rate of more than 9% on average,[1] an astonishing accomplishment. In 2010 China surpassed Japan in terms of GDP and became the second largest economy in the world. In 2014 China's GDP reached US$10 trillion dollars: it is now one of only two countries in the world to have attained this scale—the other is the United States of America (USA).[2] Policy reform and innovation have been important drivers of China's remarkable achievement.[3] Since 1978 China has implemented a series of large-scale science and technology (S&T) reforms that have accelerated progress in higher education and research and development (R&D). The 2008 global financial crisis disrupted the high growth rate of China's manufacturing-based economy, which adapts or imitates traditional technologies from developed economies. As a result of this crisis, China was pressed to make structural economic reforms that focused on building up domestic innovation infrastructure and the competitiveness of domestic research institutions. These policies have become key factors in influencing the country's continuing economic development. In 2014 the Global Innovation Index (GII) ranked China at 29th place worldwide, 1st among upper-middle-income nations and 7th in the South East Asia and Oceania regions. China also leads substantially in innovation among the BRICS nations (Brazil, Russian Federation, India, China, and South Africa). China's most notable achievement in the GII is in the Knowledge and technology outputs pillar, in which it ranked 2nd in 2014; this led to its 2nd place in the Innovation Efficiency Ratio in that year. This chapter provides an overview and analysis of the evolution of China's key S&T policies and their impact over the past three decades. It also outlines a new phase of key policy change taking place today that could have major effects in the coming decade.

Four phases of China's S&T policy evolution

In the late 1970s China implemented a series of S&T policies to boost the country's economy in relation to the rest of the world. Since then, its S&T policies have evolved to become vital drivers of progress for both research and the economy.

The experimental phase (1978–85)

In early 1980s, China's economic foundation was weak and its level of S&T research was far behind that of developed nations. It became clear that the Soviet model for S&T research, which it had adopted in the 1960s, had serious drawbacks and had led to a severe disconnect between research and industry. Initial policy reform, therefore, focused on spin-offs and partial privatization of selected parts of public research institutions that were commercially viable. This separation initially alleviated some of the financial burden of the holding institutions; later these privatized entities became substantial assets. Although they were few in number, some of the most successful technology companies in China today were formed during this period. They include the computer products and services company Lenovo (formerly Legend computer), a spin-off from the Computing Institute of the Academy of Sciences; and the conglomerate Founder Group, a spin-off from Peking University based on a digital Asian font typesetting technology. The initial phase of reform took a bottom-up approach because at that time national S&T funding was still very limited. At the national level, important initiatives such as the Key National Research Projects (1984), the Key National Laboratories, and others were launched to focus the limited available funding on research groups that exhibited better performance.[4]

The systemic reform phase (1985–95)

Top-down nationwide system reforms did not take place until 1985, when the central government issued the Science and Technology System Reform Act. The primary objective of this Act was to bridge the gap

between research institutions and relevant industries. By emphasizing competitiveness and other connections to the market, the Act aimed to gradually strengthen the economic impact of S&T funding. As a result of this Act, a number of reforms took effect. The most significant included the establishment of the National Natural Science Foundation of China, which is intended to promote and finance basic and applied research,[5] along with a number of new initiatives supporting applied and translation research such as the 863 Program (1986), the Spark Plan (1986), the Torch Plan (1988), and the Shenzhen Stock Exchange for small and medium-sized enterprises (1990), which all sought to improve the prospects of commercialization.[6]

To improve the country's higher education system and enhance the link between higher education and social development, in 1993 the government instated the 211 Project as part of its long-term strategies for national economic and social development. A special budget was dedicated to a group of leading universities selected from each province and from major cities such as Beijing. This budget was enacted in the country's 9th Five-Year National Budget Plan, and was fully implemented in 1995. An important talent programme—the Hundred Talents Program of the Chinese Academy of Sciences, which offers positions to qualified applicants with an international doctoral degree—was also introduced during this period to encourage overseas Chinese scholars to return to China and take up key teaching and research positions.[7]

The deepening reform phase (1996–2006)

The 9th Five-Year National Budget Plan, the Outline of the 2010 National Target, and a series of resolutions officially kicked off a period of deepening of system reform in S&T development. A fundamental national strategy was officially established with the aim of 'rejuvenating the nation's economy with science and education.' In 1996 China passed the Act of Promoting Commercialization of S&T Discoveries and Inventions. Together these new policies focused on three areas: shifting the drivers of innovation from public research organizations to industrial sectors; improving the R&D and innovation capacity of industrial sectors; and improving the efficiency of the commercialization of academic outputs.

During this period, changes in the national innovation infrastructure encompassed four key measures. These measures were the launch of the 985 Initiative, intended to expand the 211 Project to include key technology and engineering universities for the national advanced education development fund as a way to foster the development of world-class Chinese universities; the implementation of the Knowledge Innovation initiative in the Chinese Academy of Sciences to raise the research levels of public institutions; the establishment of large-scale R&D funding for basic research with initiatives such as the 973 Program; and the introduction of the Yangzi River Scholars Program, which significantly increases professors' wages to attract talented researchers and professors to Chinese Universities.[8]

Long-term plan and policy optimization (2006–14)

A Medium- and Long-Term National S&T Development Plan for 2006–2020 (the 2006 National Plan) was issued in 2006. The 2006 National Plan outlines guidelines for S&T development: nurturing independent innovation, fostering the ability to leapfrog in key technology areas, building major infrastructure, and developing future global leadership. The plan emphasizes achieving sustainable economic growth, seeking innovation-driven growth strategies, and enhancing independent innovation capacity. During this period the government's focus was the optimization of the effectiveness of the policy and the management of its implementation. Previously issued policies and regulations that had lacked coordination needed to be consolidated into sets of coherent policies. Policy objectives shifted from promoting R&D to building an innovation ecosystem. Those one-fits-all policies had to be tailored to address more specific goals to be effective.

To further push the mobility of innovative talent, particularly in critical S&T fields, a very effective Thousand Talents Recruitment Program was launched by the central government in 2011. So far this programme has drawn more than 2,000 overseas Chinese scholars and leading industrial innovators back to China.

In 2012 China set the goal of being a 'top innovative nation' by 2020. The 18th Communist Party National Congress held at the end of 2012 established 'innovation-driven growth strategy' as a national development strategy. It called for setting clear targets, improving entrepreneurship, making industry the main driver behind innovation, and establishing market-oriented mechanisms to facilitate collaborative technology transfer from academics to the industrial sectors. Together, these changes should propel China's global competitiveness in innovation and ensure its long-term sustainable development.[9]

Outcomes and analysis of S&T reform

The wide range of S&T policies implemented and adjusted in the past three decades in China has had a direct impact on the outcomes that apply to innovation. From 2002 to 2012, China's GDP more than quadrupled, leaping from US$2 trillion to US$8.7 trillion. The data reveal that these policies have effectively advanced the development of an innovation ecosystem; they have also brought about an educated workforce of significant size, laying a solid foundation for the future development of innovation capacity in the country.

The next sections present basic data illustrating China's S&T development in this decade in four areas: R&D investment; the results of innovation—that is, patents, products, and research publications; science education; and the cultivation of R&D talent.

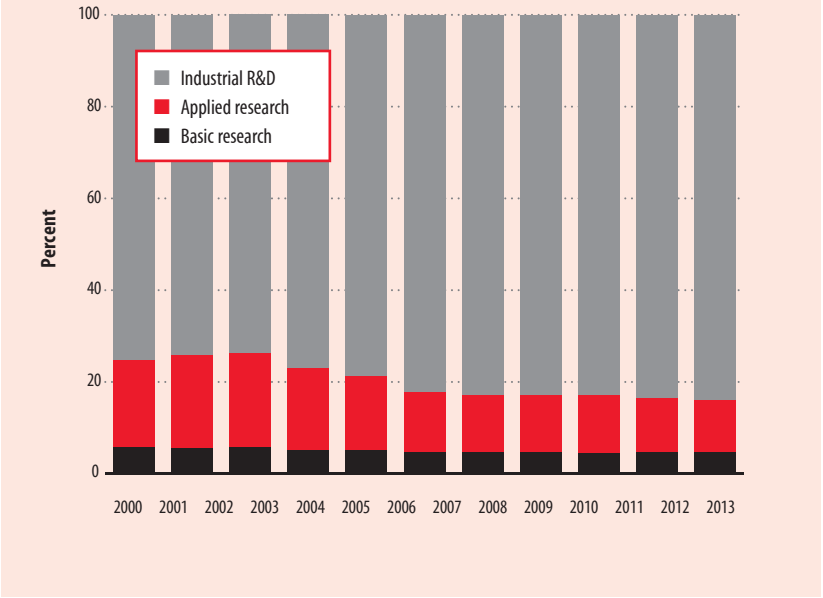
S&T and R&D investment

As shown in Figure 1, total R&D investment in China increased from about 1% of GDP in 2002 to 2% of GDP in 2012.[10] The share of local government fiscal expenditure on S&T relative to the central government fiscal expenditure on S&T jumped from approximately 40% of total government fiscal expenditure on S&T before 2007 to approximately 50% since 2007.[11] This increase is strongly correlated with the issuance of the 2006 National Plan. Figure 2 shows that the percentage of R&D investment increased from 2002 to 2012, although investment in basic and applied research has not kept pace. R&D investment by the industrial sector increased steadily from 70% of total investment in 2002 to 80% in 2012.

Figure 1: Total R&D investment, 2002–12

Source: National Bureau of Statistics of China, 2013a.

Figure 2: Distribution of S&T investment, 2002–12



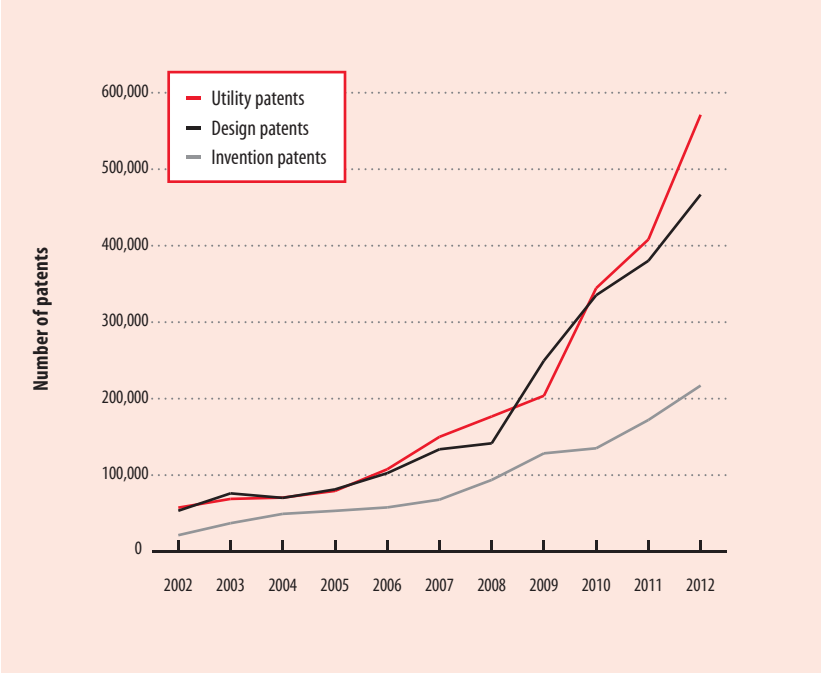
Source: National Bureau of Statistics of China, 2013b.

Innovation results: Patents, products, and research publications

Domestic patent applications have grown rapidly, with an average rate of approximately 17.5% in recent years. Since 2012 China has become 1st in the GII indicator for the number of total domestic patent applications; it has also been 1st in the GII indicator for domestic resident utility model applications for all years from 2011 through 2014. However, based on national data, the growth of international patent applications appears to be slowing in comparison to the very rapid growth of domestic patent applications. Within the domestic applications, the issued invention patents grew more slowly than issued utility models patents and designs patents (see Figure 3). Between 2002 and 2012 technology product output (proxied by revenue from new products; see Figure 4), increased rapidly, especially after 2006. This increase demonstrates that the Chinese government's innovation policies were successful in attracting organizations to invest in R&D and helping enterprises to be more successful in terms of innovation.

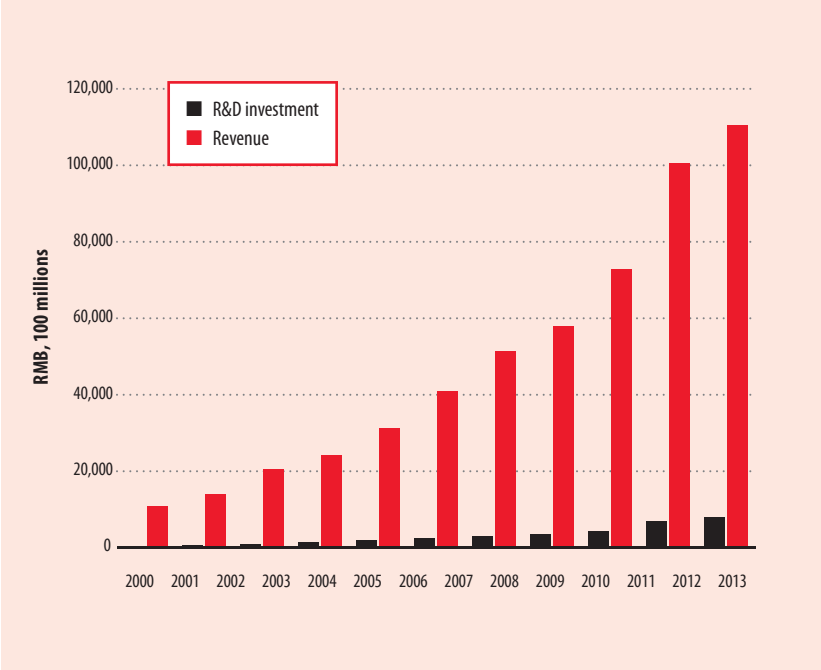
Figure 5 shows that Chinese research publications have made huge increases from 2000 to 2011 according to the three key international indexes—the Science Citation Index (SCI), the Engineering Index (EI), and the Conference Proceedings Citations Index-Science (CPCI-S). The corresponding average annual growth rates are 16.6%, 22.9%, and 21.8%, respectively. In 2000, China ranked only 8th, 3rd, and 8th worldwide in the SCI, the EI, and the CPCI-S, respectively. Since 2007, these worldwide rankings have gone up to 2nd, 1st, and 2nd place, respectively. This demonstrates that both the 211 Project of 1993 and the 985 Initiative of 1998, which aimed to boost higher education

Figure 3: Patents issued, 2002–12



Source: National Bureau of Statistics of China, 2013b.

Figure 4: R&D investment and revenue from new products, 2002–12



Source: National Bureau of Statistics of China, 2013b.

and establish the Chinese Natural Science Foundation and other research establishments, have made a great impact on China's research publications.

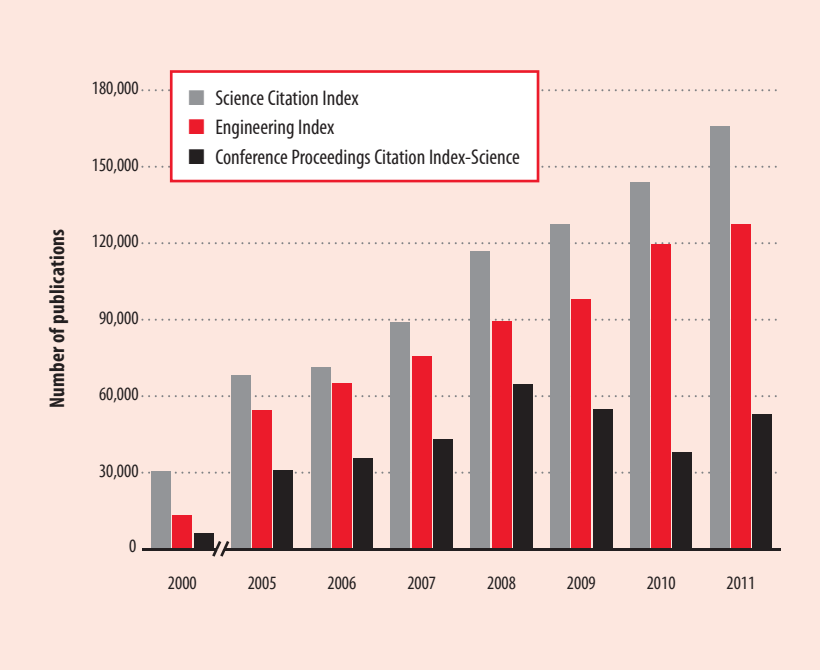
Science education

The successful development of science and technology in China cannot be separated from the development of education and the cultivation of a highly skilled workforce. The reform puts an intense emphasis on education and is making a huge attempt to develop top-quality education and to increase the ratio of high school graduates who are enrolled in colleges and universities. The number of college and university graduates in the sciences increased from 1,337,300 students in 2002 to 6,081,600 in 2012 (Figure 6)—an average annual increase rate of 16.4%. The number of Master and PhD graduates increased from 80,800 in 2002 to 486,500 in 2012, an average annual increase rate of 19.7%. The vast talent cultivated by the strong scientific education system continuously offers a highly skilled, educated workforce for the marketplace to support the rapid build-up of China's innovation system.

Cultivation of an R&D workforce

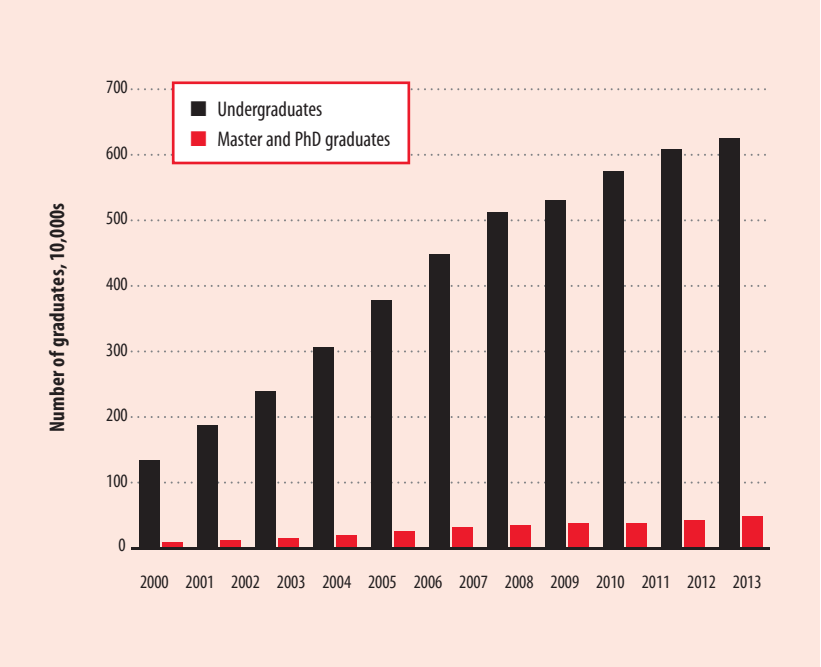
China's S&T policies place great value on S&T talent mobility. The Thousand Talents Program and a series of other talent programmes have greatly added to China's high-end talent pool, especially in the most competitive fields. A number of important breakthroughs can be attributed to those who have returned to China from abroad. China's focus on education has led to a rapid increase in the number of R&D personnel (the GII indicator for researchers in headcounts per million population increased from

Figure 5: Number of Chinese science and technology publications taken by three key international indexes, 2002–12



Source: National Bureau of Statistics of China, 2013b.

Figure 6: Graduates in science, 2002–12



Source: National Bureau of Statistics of China, 2013b.

1.1 million in 2009 to 1.5 million in 2012), as well as their quality and skill. Since 2004 China's R&D full-time equivalent personnel grew at a rate of 10% or higher, and by 2012 it had already reached a total of 3.3 million people.[12]

What other countries can learn from China

Since their beginning in the 1980s, China's evolving S&T policies and its economic reforms have had a profound effect on the outcome of innovation in the country, especially from 2002 to 2012. By considering the quantitative analysis made available by the GII, the following positive observations can be drawn: First, the shift from a bottom-up to a top-down approach has worked well for a developing economy that began with limited national resources.

Second, the increase in R&D investment went hand in hand with a large increase in GDP, as evidenced by China's improvement in the GII indicator on gross expenditure on R&D, which progressed from 25th place in 2012 to 21st in 2013, and finally to 19th in 2014. Most notably, following the launch of the 2006 National Plan, Chinese R&D investment clearly stepped up and the rate of local government investment in R&D surpassed the rate of investment made by the central government. Moreover, the positive market response encouraged the industrial sector to steadily increase R&D investment, as seen by the improvement in GII variable GERD financed by business, which grew from 73.9% in 2011 to 74.6% in 2014. However, investment in basic and applied research has not kept up with this pace, warranting serious concern.

The third observation is that the strategy of 'rejuvenating the nation's economy with science and education' has accelerated the development of China's top education system (evidenced by the GII variable QS university ranking, which improved from 36th in 2011 to 10th in 2014). The quantity of undergraduates and Master's graduates has clearly increased (seen by the GII variable on tertiary enrolment, which grew from 21.8% of gross enrolment in 2009 to 26.7% in 2012). Both the quality and quantity of researchers has greatly increased, and the rate at which researchers in basic sciences has increased has been comparatively higher than the rate of increase of researchers in other areas.

The fourth observation concerns the outputs of R&D research: the increase of patent applications in China and of utility patents has been rapid. This growth is demonstrated by the GII through its indicators domestic resident patent applications, which rose from 293,000 patents in 2010 to 704,000 patents in 2013; and domestic resident utility model applications, which rose from 407,000 applications in 2010 to 885,000 in 2013. In addition, science and technology publications by Chinese researchers have enjoyed a high intake worldwide by the SCI, the EI, and other international indices, although the percentage of top-quality papers remains low (seen in the GII through scientific and technical articles, ranked 40th in 2011 dropped to 56th in 2014; and citable documents H index, ranked 16th in 2014).

What China can learn from other countries

Although China has made remarkable achievements in R&D investment and S&T outputs, quite a large gap still exists between China and developed nations in terms of investments in basic research, high-value inventions, and high-impact research, which are all essential for entering the high-income category of nations. Indeed, the 2014 GII placed China 2nd in the Knowledge and technology outputs pillar, close to or even overtaking some high-income nations. However, Creative outputs (ranked 59th in 2014), Market sophistication (concerned with credit system and openness, ranked 54th in 2014), and Institutions (concerned with the regulatory and legal system, ranked 114th in 2014) are three pillars that have dragged down China's overall GII competiveness when compared with top-ranking countries. China has set a national target of becoming a leading innovative country by 2020. Achieving this target depends on continuing policy reform to further improve a balanced relationship between the government and market forces; to establish a more comprehensive innovation ecosystem; to nurture a legal and regulatory system that encourages investment in innovation and entrepreneurship by all sectors; and to foster open and fair competition among private, state-owned, and foreign enterprises.[13] To meet this goal, besides boosting investment in research and commercialization activities, China can look towards reforms undertaken by other countries at the same level of development to address issues in legal and regulatory systems, encourage market forces, and foster competition among all stakeholders.

The latest reforms

During the National Innovation Conference held in 2012, the Chinese government clearly acknowledged the need to improve the above-mentioned areas.[14] Since the transition of the present government during the 18th Communist Party Congress, China has begun yet another round

of policy reforms, five of which are noted here. First, an amendment to the National Act for Promoting Technology Transfer has been put forward; this may become China's own Bayh-Dole Act (also known as the US Patent and Trademark Law Amendments Act), giving universities and public institution's the autonomous right to license the patents generated from central government R&D funding. It further ensures that inventors will share in a greater percentage of the proceeds. A pilot programme to test this new law has already begun in 11 universities, and it is predicted that it will not be long before it is enacted by the next session of the Chinese People's Congress. Second, in January 2015 the Chinese government issued the 2014–2020 Action Plan on the Implementation of National Intellectual Property Strategy. The plan aims to ease market processes for transactions pertaining to intellectual properties, including declassifying classified patents for civilian use and providing funding support to seed companies that specialize in intellectual property transaction services. Third, to address efficiency in S&T funding, the Chinese government has overhauled the entire S&T funding process, which will be replaced by a new process with a greater accountability to the stakeholders. Fourth, China has launched a special stock market (the National Equity Exchange and Quotations) to allow technology start-up companies, which are not yet profitable, to have more avenues to raise development capital. Furthermore, rules and regulations are simplified to encourage mergers and acquisitions. And fifth, in March 2015 the Chinese government published *A Guideline for the Development of Public Incubation Space to Promote Grassroots Entrepreneurship.*[15] This guide encourages the participation of multilevel capital markets, including crowdfunding.

The new set of policies being implemented today should help to address many of the country's challenging issues in the coming decade and have a positive impact on China's ranking in future GIIs.

Notes

1 World Bank statistics show that since 1978, China's GDP growth rate is 9.83% on average (see the World Bank's World Development Indicators database, http://databank.shihang.org/data//reports.aspx?source=2&country=CHN&series=&period=).

2 China's GDP of China reached RMB 63.64 trillion (US$10.36 trillion) in 2014. The data can be found from the central government's work report of 2015, available at http://www.guancha.cn/politics/2015_03_17_312511.shtml (in Chinese).

3 Chinese officials have long been aware of the importance of S&T. Deng Xiaoping stated in 1988, when meeting with President Gustav Husak of Czechoslovakia, 'In my opinion, science and technology is the most important productive force.' Details of the speech can be found at http://news.xilu.com/2009/0903/news_112_13463.html (in Chinese).

4 For more information on Chinese State Key Laboratories, see https://en.wikipedia.org/wiki/State_Key_Laboratories.

5 Details about the National Natural Science Foundation of China are available at http://www.nsfc.gov.cn/publish/portal1/.

6 Details of the Spark Plan can be found at Cao, 2006, and at http://in.china-embassy.org/eng/szyss/jm/zhongguonongye/agriculturepplanning/t143140.htm, (at http://baike.baidu.com/view/57377.htm in Chinese); details of the 863 Program at https://en.wikipedia.org/wiki/863_Program (http://baike.baidu.com/view/4785616.htm in Chinese); of the Torch Plan at http://www.chinatorch.gov.cn/english/index.shtml; and of the Shenzhen Stock Exchange for small and medium-sized enterprises at http://baike.baidu.com/link?url=PpsCaaGhLeRFCF0JtxxJy3Xw1jqUugdN5Pv9vlQ1mwvJuGHe7Fr1QlCFoxel12x2qWi1LKqFsfHTQgEwktKF9_ (in Chinese).

7 For information on the Hundred Talents Program, see http://english.ucas.ac.cn/JoinUs/Pages/TheHundredTalentsProgram.aspx.

8 These plans succeed in helping Chinese colleges and universities attract many overseas talents, promoting the progress of Chinese higher education and levels of scientific research.

9 *The Reform and Opening Up of Chinese S&T in the Past 30 Years,* a book by the former minister of the S&T department, Wan Gang, gives a detailed description of these policies and their influence.

10 These data are from CNKI (China National Knowledge Infrastructure), the largest Chinese database, which contains abundant data for almost every field in science and social science. CNKI is available at http://www.cnki.net/ (in Chinese).

11 Chinese R&D investment includes two parts: industrial sector funding and government funding. Government funding can be further divided into central government funding and local government funding.

12 National Bureau of Statistics of China, 2013b.

13 More details are discussed in People's Publishing House, 2012.

14 See speeches by General Secretary Hu Jingtao, Prime Minister Wen Jiabao, and Deputy Prime Minister Liu Yandong in the 2012 National Innovation Conference. The full content of these is not available online, but a summary can be found at http://www.gov.cn/ldhd/2012-07/07/content_2178574.htm (in Chinese).

15 The Chinese government attaches great importance to entrepreneurship now. Prime Minister Li Keqiang has frequently granted interviews to representatives of successful entrepreneurs seeking to improve conditions for entrepreneurship in the country.

References

Cao, Y. 2006. *The Exploration and Practice of Spark Plan for Past 20 Years.* Beijing: China's Agricultural Science and Technology Press.

Lin, Y. 2014. *The Miracle of China.* Shanghai: Due Press.

National Bureau of Statistics of China. 2013a. *China Statistical Yearbook 2013.* Beijing: China Statistics Press. Available at http://www.stats.gov.cn/tjsj/ndsj/2013/indexeh.htm.

———. 2013b. *China Statistical Yearbook on Science and Technology.* Beijing: China Statistics Press.

People's Publishing House. 2012. *Speed Up the Construction of National Innovation System by Deepening the Reform of Science and Technology System.* Beijing: People's Publishing House.

The People's Republic of China. 2015. *A Guideline for the Development of Public Incubation Space to Promote Grassroots Entrepreneurship.* Official report.

The People's Republic of China, State Council. 2006. *National Outline for Medium and Long Term Science and Technology Development (2006–2020).* Official report.

Wan, G. 2008. *The Reform and Opening Up of Chinese S&T in the Past 30 Years.* Official report.

Radical Institutional Change: Enabling the Transformation of Georgia's Innovation System

Cristina Chaminade and **Maria Moskovko,** CIRCLE, Lund University

Georgia is a post-Soviet country in the south Caucasus region, strategically located on the crossroads of Eastern Europe and Western Asia. Occupying a territory of 69,700 square kilometres and with a population of 4.5 million people, Georgia belongs to the Global Innovation Index (GII) lower-middle-income economies group.

The 2015 GII report recognizes Georgia as an innovation achiever among other countries in the same income-group and region.[1] In the GII 2014 Georgia ranked 74th out of the 143 countries covered in the report. For the last four years, Georgia has been outperforming its lower-middle-income group peers in terms of Institutions (pillar 1), Human capital and research (pillar 2), Market sophistication (pillar 4), and Knowledge and technological outputs (pillar 6); it also has achieved noticeable improvements in the GII Innovation Efficiency Ratio. Overall, Georgia consistently scored better on the input side than on the output side.

This chapter discusses the key innovation policies and private-sector actions that are enabling Georgia to drive a rapid and positive change in its innovation performance. Since the early 2000s, the country has been labelled a top reformer according to the following indices: the World Bank's Ease of Doing Business, the Heritage Foundation's Index of Economic Freedom, and Transparency International's Corruption Perception Index. Georgia is a very good example of an economy that has successfully transitioned from an emerging innovation system by transforming its institutional framework. This pattern of development has been followed by other countries such as Kenya and Armenia (also highlighted as examples of outperformers in the current GII).

The first section of this chapter looks at the enablers of the radical institutional change in Georgia, stressing the role of the new West-educated elite and the diaspora in driving the processes of change as well as the influence of the accords with the European Union (EU). The following section reveals the existing challenges of the Georgian innovation system. The chapter argues that its future development may require complementing institutional change with efforts in other, less-developed aspects such as human capital and research capabilities, infrastructure, business sophistication, and creative outputs. The chapter concludes with some reflections on the future opportunities and challenges of Georgia.[2]

The chapter is based on primary and secondary data. Interviews were conducted in February 2015 with Georgian policy makers. Topics included identifying the organizations—both newly created and those inherited from the Soviet past—that support Georgia's science, technology, and innovation system; regulatory changes introduced since 2003 and societal perception of these reforms; and the impact of post-Soviet heritage and of international cooperation and linkages. Finally, the interviewers asked about the main challenges faced by Georgian policy makers and what lessons could be learned by other post-Soviet countries from Georgia's experience.

Institutional change: Enabling the transformation of Georgia's innovation system

Georgia's improved innovation performance during 2011–14 may be explained by the institutional changes that have taken place since the Rose Revolution—the first peaceful transfer of power in the Caucasus—in 2003. Institutions—in the context of this chapter defined as the 'rules of the game'[3]—have long been considered a key component of a national innovation system.[4] Institutions may be 'hard' formal ones such as laws and regulations, or they may be 'soft' informal ones, characterized by rules shaping social behaviour. The latter may exist in a society even when legally binding rules are not in place.

Georgia, as part of the former Soviet Union, experienced the first set of radical changes that came with the dissolution of the Soviet regime

Box 1: Reducing corruption in Georgia: The perspective of policy makers

Reducing corruption has become one of the cornerstones of institutional reform in Georgia, and officials are deeply concerned about controlling all aspects of it.

As one of the interviewees noted:

> Points of contact between citizens and government had to be taken to the minimum, in order to get rid of the widely spread corruption in services that the state is obliged to provide to the citizens. That was innovation in itself for us, which had an impact on everybody's life (Interview, 10 February 2015).

As another interviewee pointed out:

> … When the government is corrupt, people only care about getting their share of the 'profit'. When corruption and cumbersome bureaucracy are eradicated, people [in power] care only about the future of the country and decisions are made very fast (Interview, 10 February 2015).

in 1991. The shock of this collapse led the country to undertake major internal transformation and to develop new structures in state-building. As a result, older *formal* institutions were replaced by a set of new laws and Acts. However, the *soft* institutions, represented by social practices, needed longer to evolve. For example, the weak political structure, high rates of organized crime, and widespread corruption in the 1990s positioned Georgia as a failed state.

Following massive protests over the disputed nature of the fairness of the parliamentary elections, the 2003 democratic Rose Revolution in Georgia brought a change of political power and a second wave of changes. Under the new political elite of predominantly younger and West-educated individuals, Georgia adopted what the Organisation for Economic Co-operation and Development (OECD) has characterized as the 'Guillotine approach' to institutional reforms.[5] Instead of a gradual transformation of different institutions (of regulations and regimes), Georgia adopted a much more drastic approach to institutional change (similar to the approach taken by Kenya and Armenia). The new agenda put forward a rigorous anti-corruption campaign, which improved the economic situation. The new regulations (hard institutions) enabled a fundamental transformation of Georgia's institutional environment with simplified tax codes and improved tax administration, battled corruption, and put into place various mechanisms to make the country attractive to foreign direct investment (FDI).[6] Box 1 presents the views of some policy makers concerning the country's fight against corruption.

The role that the young West-educated elite and diaspora played in Georgia's institutional reform processes and in establishing transnational innovation networks is evident. But the changes were not limited to hard institutions alone. The role of the country's youth may also be reflected in the change of the social norms, which diffused into the societal practices by virtue of the country's commitment to reforms. Georgian anti-corruption efforts, introduced by the young West-educated elite, have spread widely in Georgian society and remain the most prominent example of successful changes in the country's soft institutions. For example, as some interviewees noted, the road traffic police (who used to be the most corrupt) were replaced entirely by newly selected and trained officers who are under more stringent control nowadays and do not take bribes. As a consequence, people stopped giving and receiving bribes in order to get any kind of licence or official document as had been customary earlier.

The 2008 military conflict with the Russian Federation, followed by a trade embargo on Georgian export produce, caused strained geopolitical conditions and a complex economic situation in the country. As a consequence, a series of new reforms were implemented with the purpose of diversifying the economy and improving the country's image for attracting foreign investors;[7] ultimately these provided a way to introduce technology in the country and modernize the industrial sector.

The modernization of the research system inherited from the Soviet Union (see Box 3) also began around this time. In 2010 the Shota Rustaveli National Science Foundation, merging the Georgia National Science Foundation and the Rustaveli Foundation for Georgian Studies, Humanities and Social Sciences, was established. The main mandate of the newly created foundation was to reform the humanities and social sciences in Georgia and introduce mechanisms to fund research through open competition and international research programmes. In 2008 the Ministry of Diaspora was created with the aim of providing incentives for the return of migrated Georgians, including around 500 researchers.

Probably one of the most important forces behind the most recent transformations of the socio-economic system in which the innovation system is embedded is Georgia's cooperation agreement with the EU; negotiations for this

Agreement started in 2010. The cooperation frameworks under the European Neighbourhood Policy Instrument, the Eastern Partnership initiative, and (since 2014) the Association Agreement—which includes integration to the Deep and Comprehensive Free Trade Area with the EU—have served simultaneously as motivators and tools for carving Georgia's domestic institutional reforms. Since the start of the negotiations in 2010, the EU requested the introduction of substantial reforms in technical regulations, sanitary and phytosanitary measures for agricultural products, strict intellectual property rights (IPR) regulations, and rigorous competition rules (Table 1).

The year 2012 brought yet another change of political elite in Georgia: The opposition party came to power. As their predecessors did, the new elite put continuous economic development on the agenda,[8] along with some clear steps in the direction of boosting innovation. Georgia's Innovation and Technology Agency (GITA) was established under the auspices of the Ministry of Economy and Sustainable Development in April 2014, with the aim of coordinating innovation and technology development at the national level. Additionally, the Research and Innovation Council, chaired by Georgia's prime minister, was established in January 2015. The Council's responsibility is the strategic development of coordination of the science, technology, and innovation policy; GITA acts as a secretariat for it.

This most recent effort in institution building in support of innovation activity may be seen as a positive development, but it is too early to predict its impact on the overall functioning of Georgia's innovation system. The next section discusses some of the challenges ahead in its continuous transformation.

Table 1: Political changes and changes in innovation system of Georgia

Year	Political change	Change in the innovation system
1991	• Dissolution of the Soviet regime	• Fragmentation of the innovation system • Brain drain
2003	• Rose revolution: New elite of West-educated individuals comes to power	• Guillotine approach to institutional reform • Strong focus on reducing corruption, simplifying tax regulations, and generally improving governance
2008	• Military conflict with the Russian Federation	• Diversification of the economy (economic reform) • Focus on attracting foreign direct investment to the country • The Ministry of Diaspora is established
2010	• Start of negotiations with the European Union (EU) for the EU-Georgia Association Agreement	• Georgia is required to introduce substantial reforms in: » Technical regulations » Sanitary and phytosanitary measures » Intellectual property rights legislation » Competition rules • The Shota Rustaveli National Science Foundation is established
2012	• Opposition party wins the elections – change of political elite; focus on economic development	
2013		• GITA (Georgia Innovation and Technology Agency) is created
2014	• Association Agreement with the EU is signed	• Access to the EU market
2015		• Research and Innovation Council is created

Georgia's innovation system: Strengths and challenges for the future

Georgia's strengths can be traced back to the aforementioned deep institutional transformation of the country, which aimed to increase transparency, eliminate corruption, attract FDI, and facilitate business.[9] As a consequence of the profound reforms that occurred in its hard institutions (laws, rules, and regulations), Georgia excels in labour market flexibility, captured by its ranking in the following indicators of the GII 2014: the cost of redundancy dismissal (ranked 1st), ease of starting a business (4th) and paying taxes (20th), ease of getting credit (3rd), and ease of protecting investors (16th), among others (Table 2).

On the other side of the coin, Georgia's major future challenges are mostly related to how the aforementioned laws, rules, and regulations are accepted by society (soft institutions), the immaturity of its business capabilities, and bottlenecks in its national education and research systems. These will be described in detail in the next section.

Transforming soft institutions

Although formal institutions may be established quickly, their effect on the soft institutions—on socially accepted norms and principles—may take a lot longer to diffuse. As pointed out by some Georgian policy makers, both the country's higher education system and its IPR system now substantially approximate the standards of the EU. Nevertheless, the soft institutions inherent in the Georgian environment are yet to come closer to EU values and norms. Two clear

Table 2: Georgia's GII 2014 strengths and weaknesses

Strength		
GII indicator	Indicator or sub-pillar title	Rank
1.2.3	Cost of redundancy dismissal, salary weeks	1st
1.3.1	Ease of starting a business*	4th
1.3.3	Ease of paying taxes*	20th
2.1.5	Pupil-teacher ratio, secondary	2nd
4.1.1	Ease of getting credit*	3rd
1.2.3	Cost of redundancy dismissal, salary weeks	1st
1.3.1	Ease of starting a business*	4th
1.3.3	Ease of paying taxes*	20th
2.1.5	Pupil-teacher ratio, secondary	2nd
4.1.1	Ease of getting credit*	3rd
4.1.3	Microfinance gross loans, % GDP	11th
4.2.1	Ease of protecting investors*	16th
4.3.1	Applied tariff rate, weighted mean, %	6th
6.2.1	Growth rate of PPP$ GDP/worker, %	3rd
7.2.4	Printing & publishing manufactures, %	13th

Weakness		
GII indicator	Indicator or sub-pillar title	Rank
2.1.1	Current expenditure on education, % GDP	129th
2.3.3	Average score top 3 universities*	70th
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	117th
4.2.2	Market capitalization, % GDP	99th
4.2.3	Total value of stocks traded, % GDP	105th
4.3.3	Intensity of local competition†	116th
5.1.2	Firms offering formal training, % firms	98th
5.2.1	University/industry research collaboration	126th
5.3.1	Royalty & license fees payments, % total trade	106th
7.1	Intangible assets	122nd
7.1.4	ICTs & organizational model creation†	114th

Source: GII, 2014.
Note: * indicates an index; † a survey question.

examples of the current challenges with soft institutions influencing research and innovation are the societal perception of the role of education and the importance of IPR (Box 2).

Bottlenecks in education and research systems

In 2014, Georgia outperformed its income group peers in terms of Human capital and research (pillar 2), but this is mainly the result of a very good performance in the pupil-teacher ratio in secondary education indicator, where it ranks 2nd. Georgia still scored low on government expenditure in education (129th) and R&D funds per researcher are 10 times less than the same indicator for the Russian Federation, Ukraine, the Baltic States, and Belarus,[10] and its score in the excellence of universities is also low (Georgia ranked 70th in the average score of the top 3 universities).

Weaknesses in the current system are deeply rooted in the research system inherited from the former Soviet Union as well as the large-scale brain drain that followed its collapse (Box 3).

Some of these weaknesses have been addressed in recent years. In 2015 the government increased the salaries for researchers up to 250% (which may seem to be a huge amount, but earlier remuneration was minimal). The Diaspora Ministry, established in 2008, has identified approximately 500 Georgian researchers worldwide and aims to provide incentives that will help reverse the brain drain that occurred after the collapse of the Soviet Union. The Ministry of Education and Science is currently undergoing extensive reforms to boost standards to the European level.

A positive sign that the research system is gaining momentum can be seen in changes to scientific output. Georgia is quickly catching up in terms of scientific publications with co-authors from the Western world, particularly from the United States of America and Germany,[11] in a context where international scientific collaboration outside the former Soviet Union was nonexistent.

Immature business capabilities

Georgia ranked low in the 2014 GII's Market sophistication and Business sophistication pillars in the following indicators: firms offering formal training (98th), royalty and license fees payments as a percentage of the total trade (106th), market capitalization (99th), intensity of local competition (116th), and total value of stocks traded (105th). Together these poor showings signal that the business sector still suffers from low capitalization, a lack of training, low levels of patenting activity, and low levels of knowledge-intensive industries, as reflected in the country's low levels of intangible assets and its use of information and communication technologies (ICTs) for new business models.

Related to and probably the consequence of the low level of capabilities in both the public research system and businesses, the linkages between university and industry are also weak (ranked 126th). As a result, the capacity of the public research system and the business sector to generate, absorb, and diffuse knowledge is still low.[12]

Increasing the innovative capabilities of the public and private sectors will take time, as we know from the leapfrogging experience of the Asian tigers (the Republic of Korea and Singapore are two such examples of small economies). Sustained and large investments in education, research, and innovative capabilities

Box 2: Challenges with soft institutions: Perception of education and intellectual property rights

Despite having all legislation in place, the enforcement of intellectual property rights (IPR) remains a challenge in Georgia as in many other countries. According to one policy maker interviewed for this chapter:

> Partially this relates to the post-Soviet heritage, where private property did not exist and intellectual property was not given quite the same attention. Apart from that, Georgian society at large is not even aware why illegal content should not be downloaded (Interview, 10 February 2015).

Raising awareness throughout society about the need for robust national IPR has thus been a priority assignment of Sakpatenti, the National Intellectual Property Centre of Georgia. Another challenge is partially posed by the:

> lack of interest from multinational corporations (MNCs) to enforce the IPR on the Georgian market and, generally, developing countries' markets. ... This could have been done by arguing the infringements in courts and lowering the licensing prices for developing markets, rather than following their general foreign market policy. If an MNC reduces the price, I can then persuade my society to purchase the legal content from them. Paying less would be better than not paying anything at all (Interview, 10 February 2015).

Even though the post-Soviet heritage left Georgia with the cultural understanding of the importance of possessing higher education and corruption in education is no longer present, there is:

> not too much quality, either. ... The notion of having a 'piece of paper'—a diploma—rather than knowledge is still essential for many people (Interview, 9 February 2015).

in firms are needed, although this is a major challenge for countries with very limited resources.

Steps ahead

The Association Agreement with the EU signed in 2014 may be a way to address some of the weaknesses of the business sector and the research system outlined above. The agreement is expected to have a positive impact on the competitiveness of the Georgian firms by providing them with access to the large European market. The agreement also mentions explicit support in the effort to align Georgia's legislation to EU norms and assistance in trade-related reforms.[13] The agreement covers a large array of sectors and policy areas, including education, research, and technological development.[14] A key sector of interest mentioned in the agreement is the development of ICTs, which may have an impact on the performance of Georgia in terms of outputs in the coming years.

For Georgia, as well as for other countries in the lower-middle-income group, some of the challenges ahead rest on their capacity to *continue strengthening their education and research systems*. Continued incremental steps that increase funding and raise the quality of education and research, as well as steps that build capability, are expected to build up the foundation upon which a sound innovation system may be constructed.

A cornerstone for the future development of Georgia's innovation system is to *continue utilizing the mechanisms of cooperation with the EU* throughout the next stage

Box 3. The Georgian research system: An inherited past

In the former Soviet Union, the Academy of Sciences was organized centrally. The academies of the republics—including Georgia's—specialized in specific lines of research that were set by the All-Union Academy of Sciences. This resulted in a severe fragmentation of the innovation system after the collapse of the Soviet Union, with dramatic differences between the new independent countries in terms of capacity and specialization.[1] Georgia was left with a strong cybernetic institute and a biotechnology centre that had been devoted to the development of biological weapons for military use as well as a number of other research areas. The nearly 100 R&D organizations (mostly belonging to the Georgian Academy of Sciences) became independent entities with limited basic funding, which implied the need to compete for grants.[2] As a consequence, many institutions merged together, integrated with universities, or closed down entirely. The result is that approximately 50 research centres are operating today, with highly heterogeneous performance.[3] The severe lack of funds for education and research that occurred during the first years after the collapse of the Soviet Union forced many researchers to leave the country, further weakening Georgia's research system.

Notes

1 According to Gzoyan et al., almost '58% of R&D institutions, 66.7% of scientific personnel and over 72% of the total R&D expenditure in the USSR were concentrated in Soviet Russia'. Gzoyan et al., 2015, p. 198.

2 Gzoyan et al., 2015.

3 Interviews with policy makers, 9 February 2015.

of the Deep and Comprehensive Free Trade Area (DCFTA) implementation process. Particularly important will be approximating the functioning of SMEs in Georgia to EU standards, both in terms of regulative measures and in practice. These higher standards may lead to boosting the intensity of local competition, which is one of Georgia's current weaknesses.

The reform of institutions has been a crucial component of Georgia's current achievements in terms of innovation. It is important to *focus on the well-functioning aspects of reformed institutions and use these as a basis from which to tackle current challenges*. Eradication of petty corruption and effectiveness of state bureaucracy have been the highlights of Georgia's reform pursuits. Incorporation of the methods that worked in the past is expected to prove effective for tackling the current shortcomings in areas such as IPR enforcement.

Georgia's agriculture has been one of the country's competitive advantages. Continued attraction of FDI in agriculture, along with the simultaneous development of agricultural sciences and strengthening its absorptive capacity, are expected to facilitate innovation outcomes. Links to multinational corporations (MNCs), when strong, are usually very valuable, but these links need time and the absorptive capacity of indigenous firms to develop. Intermediate organizations such as non-governmental organizations or measuring and testing centres can play a crucial role in translating the knowledge of MNCs to local actors, as the experience in other innovation systems in transition has shown.[15]

The diaspora plays a significant role in Georgia's development, and the established Diaspora Ministry has identified more than 500 scholars with a Georgian background. If successful in bringing them back to the country, these individuals may be able to facilitate the future development of public and private research in Georgia, as well as strengthen the country's ties with scientific collaboration worldwide, as previous diaspora experiences in other economies have done.

Finally, the current unstable situation in Eastern Europe and other external factors may shift the priorities of Georgian policy makers when it comes to decision making on particular issues. However, it is essential for Georgia's continued development that the country stay on course on the innovation policy front. Utilizing the well-functioning aspects of reformed institutions may serve as a solid basis on which Georgia can stand on in these turbulent times when dealing with the contemporary challenges of its innovation system.

Conclusions and lessons to learn

Georgia has demonstrated its commitment to the steps of transition from an emerging innovation system through a deep transformation of its institutional framework. Georgia's experience may serve as a good example to follow for other developing economies that struggle with the quality of their core institutions. Other former post-Soviet countries, by following Georgia's steps in drastic institutional transformations, may also find that the successful outcomes of reforms in one area may easily spill over into other policy areas. For example, a simplified bureaucracy and rigorous tax reforms have improved the existing business climate in Georgia. Moreover, a battle against petty corruption in Georgia's public sector increased the trust of foreign investors, resulting in a significant increase of FDI inflows.

Appreciation of the role of diaspora and empowerment of West-educated elite as a means for radical institutional transformation is another lesson that might be useful for other countries. Georgia has demonstrated that its younger generation is capable of making bold decisions when it comes to drastic institutional changes. It has also signalled its appreciation of Georgians living abroad by establishing ties and cooperation with the diaspora.

Together, the institutional reforms already implemented have put Georgia solidly on a path towards greater innovation and a more robust economy. Although a lot of work remains to be done, such steps lay a foundation upon which a solid innovation system may gradually be built.

Notes

1 An 'innovation achiever' is an economy that has a GII score relative to its GDP that is significantly higher than that of other economies in its category for four or more recent years, including 2013 and 2014.

2 This chapter is based on the analysis of secondary information as well as face-to-face in-depth interviews with key informants in Georgia conducted between 9 and 10 February 2015.

3 North, 1991.

4 Johnson, 1992.

5 World Bank, 2010.

6 Çelikpala, 2004.

7 Moskovko, 2012.

8 Government of Georgia, 2014.

9 'Strengths' in the GII 2014 are defined as those GII indicators scored with percent ranks greater than the 10th largest percent rank among the 81 indicators of that economy.

10 Gogodze and Uridia, 2010.

11 Gzoyan et al., 2015.

12 Gogodze, 2013.

13 European Commission, 2013.

14 Fields covered in the Agreement include economic dialogue; management of public finances and financial control; taxation; statistics; transport; energy cooperation; environment; climate action; industrial and enterprise policy and mining; company law, accounting and auditing and corporate governance; financial services; cooperation in the field of information society; tourism; agriculture and rural development; fisheries and maritime governance; cooperation in research, technological development and demonstration; consumer policy; employment, social policy and equal opportunities; public health; education, training and youth; cooperation in the cultural field; cooperation in the audiovisual and media fields; cooperation in the field of sport and physical activity; civil society cooperation; regional development, cross-border and regional level cooperation; civil protection based on gradual approximation with the EU acquis, and also—where relevant—with international norms and standards.

15 Lall and Pietrobelli, 2005; Lundvall et al., 2009.

References

Çelikpala, M. 2004. 'From a Failed State to a Weak One? Georgia and Turkish-Georgian Relations'. *Development* 24: 75–86.

European Commission. 2013. 'EU-Georgia Association Agreement: "What Does the Agreement Offer?" '. European Union External Action. Available at http://eeas.europa.eu/georgia/pdf/quick_guide_eu_ge_aa_en.pdf.

Gogodze, J. 2013. 'Composite Indicator ECAICI and Positioning of Georgia's Innovative Capacities in Europe-Central Asia Region'. *MPRA Paper* No. 43921, posted 21 January. Available at http://mpra.ub.uni-muenchen.de/43921/.

Gogodze, J. and M. Uridia. 2010. 'Georgian Research and Development System in 1996–2005'. *MPRA Paper* No. 26333, posted 3 November. Available at http://mpra.ub.uni-muenchen.de/26333/.

Government of Georgia. 2014. Government Program for Strong, Democratic, United Georgia. Available at http://gov.ge/files/41_44526_228228_Governmentprogram.pdf.

Gzoyan, E. G., L. A. Hovhannisyan, S. A. Aleksanyan, N. A. Ghazaryan, S. R. Hunanyan, A. Bourghida, and S. A. Sargsyan. 2015. 'Comparative Analysis of the Scientific Output of Armenia, Azerbaijan and Georgia'. *Scientometrics* 102: 195–212.

Johnson, B. 1992. 'Institutional Learning'. In *National Systems of Innovation: Toward a Theory of Innovation and Interactive Learning,* ed. B.-Å. Lundvall. London: Anthem Press. 23–44.

Lall, S. and C. Pietrobelli. 2005. 'National Technology Systems in Sub-Saharan Africa'. *Int. J. Technology and Globalisation* 1 (3/4): 313–42.

Lundvall, B. Å., K. J. Joseph, C. Chaminade, and J. Vang. 2009. *Handbook of Innovation Systems and Developing Countries.* Chentelham: Edward Elgar.

Moskovko, M. 2012. 'Diffusion of European Norms: Adoption of the European Principle of Rule of Law by Georgia and Ukraine'. STVM 23. Lund: Lund University, Department of Political Science.

North, D. C. 1991. 'Towards a Theory of Institutional Change'. *Quarterly Review of Economics and Business* 31: 3–11.

World Bank. 2010. *Innovation Policy: A Guide for Developing Countries.* Washington, DC: World Bank.

Policies to Drive Innovation in India

Senapathy Krisí Gopalakrishnan and Jibak Dasgupta, Confederation of Indian Industry

India is a lower-middle-income economy in Central and Southern Asia with more than 1.2 billion people and an economy of $1.8 trillion GDP in absolute terms for 2014, and according to Global Innovation Index (GII) ranking for last four consecutive years, has been an outperformer in its peer group in terms of its innovation capacity. The other economies in India's peer group include Bhutan, Sri Lanka, Uzbekistan, and Pakistan.

The evolving policy landscape and research and development growth

In terms of the size of the economy and the volume and diversity of its population, India has an advantage over its peers, but its dominance in innovation capacity has not been mere coincidence. It is a result of the gradually increasing focus of its policy regime, a focus that has moved from science to technology and on to innovation and entrepreneurship, and has been supported by years of planning and implementation. After independence, policy makers in India targeted economic growth through industrialization and the development of science. Initially, industrial development was planned around setting up and empowering public-sector undertakings. The scientific policy focused on the acquisition, dissemination, and discovery of scientific knowledge, and stressed exclusively the cultivation of science and scientific research with a suboptimal focus on technology development.

The Industrial Policy Resolution of 1956 lay down policies that gave a state monopoly to all heavy industries. The Industrial Policy Statement of 1977 emphasized decentralization, and the Industrial Policy Statement of 1980 stressed the need to promote competition in the domestic market coupled with technological upgrading.[1] The Technology Policy Statement of 1983 stressed technology development in the country, shifting from the earlier focus on scientific development. The objective of the 1983 statement was to enable development of indigenous technology and the efficient absorption and adaptation of imported technology that could cater to national priorities. During the early 1980s, the private sector expanded gradually and the performance of Indian public-sector undertakings declined. With these policy measures in place, the GDP growth rate remained sluggish (at around 3.5%),[2] under an inward-looking and protectionist industrial policy regime.

During the 1990s, policy making in the science and technology sector started aligning with the country's overall economic policy framework, which favoured industrial research and development (R&D), the identification of technology needs, and technology development. Gradually the focus shifted towards collaboration between public and private institutions, identifying priority sectors and social needs, enhancing international collaborations, and strengthening human capital. In 1991 in a historic moment, with the help of a reformist budget, the Indian economy opened up by loosening its protectionist policies.

With a more open economy and the gradual shift in R&D and industrialization policy goals, scientific departments such as the Department of Science and Technology and the Department of Scientific and Industrial Research became proactive in collaborating with industry in public-private partnerships. This approach incentivized the private industry towards R&D by providing shared costs and rewards, and it provided a buffer against the high-risk basic research component of R&D. This collaboration was advantageous for industry. Research projects initiated at the institutes were now jointly funded by the government and industry; formerly, they would have been funded by industry alone.

According to the latest data (updated through 2009–10 and projected for two subsequent years) released by the Ministry of Science and Technology, gross expenditure on R&D (GERD) in the country has been consistently increasing over the years. From 24,117.24 crore Indian rupees (₹) in 2004–05, it has reached ₹53,041.30 crore in 2009–10, an increase of around 45%. The R&D

and GDP ratio increased significantly from 0.81% in 2004–05 to 0.87% in 2009–10. These data alluded to the strong growth in R&D in India that has occurred over the last decade compared with its closest peers, such as Pakistan (0.68% in 2007) and Sri Lanka (0.11% in 2008).[3] GERD as a percentage of GDP from 2011 to 2014 also ranks India consistently below 50, making Pakistan second in the peer group.

With this overview of India's growth in its innovation capacity, driven by its industrial and science and technology policy regime vis-à-vis its peers, the next section reviews India's innovation ranking in the GII. Subsequent sections will highlight what India has done to score higher than its peers in the lower-middle-income countries, the innovation policies that appear to have fostered innovation, and areas in policy that may need improvement. The chapter concludes with lessons to learn from India's experience and that of other countries, and, finally, a proposal for policy mixes that would enable India and similar countries improve in their innovation ranking.

Review of GII findings and pillars and their impact on India's ranking

As noted in the previous section, over the years the policy regime in India has evolved to become favourable in terms of innovation, but since the economic slowdown in 2008—specifically after 2010—the performance of the Indian economy has remained somewhat unstable. Over the last four years India has witnessed a reduction in its overall GII ranking, which dropped from 62th place in 2011 to 76th in 2014. This change in ranking can be primarily attributed to two major factors. The first concerns the changing dynamics of the country's political, educational, and business environment, and the second concerns the structural change GII has undergone to improve itself as an assessment tool over the years.

According to GII data, the input parameters in which India has consistently performed poorly during the last four years are political stability, ease of starting a business, tertiary inbound mobility, and environmental performance. These findings also resonate with the general public's perception that the government has been relatively inactive during this period in terms of making policy decisions. Among the reasons for this inactivity is the slowdown experienced in the overall economy, the country's high inflation, and clamour over severe corruption charges against the incumbent government. Weaknesses that are underscored in the GII occur in the area of ease of starting a business—a persistent matter of contention in India, which presents regulatory hurdles to entrepreneurs through a highly complex compliance regime and heavy bureaucratic interference. Such government interference discourages entrepreneurs from effectively starting and running businesses. The tertiary inbound mobility indicator concerns the number of foreign students studying in Indian institutions. Although India's higher education sector ranks better than many other developed economies in terms of the quality of its students, because of a lack of adequate infrastructure and student support system it loses out on the opportunity to attract foreign students. Finally, as a developing nation, India still holds a debate between the procurement of expensive, eco-friendly technology and the use of traditional, low-cost technologies that have a high carbon footprint. India's dismal ranking (155th out of 176) in the 2014 Environmental Performance Index is evidence of the fact that the country has lacked efficient policy measures to tackle this issue.[4]

Also influencing the decline in India's GII ranking are the structural changes of the index. The GII model is continually updated to reflect the improved availability of statistics and a better understanding of the meaning and implications of innovation. *Updates to indicators* have prompted India's drop in ranking in six of the indicators that have changed. Over the years the GII has used *new indicators* to better capture the different elements of the model. For example, adding indicators on global entertainment and media output and using patent applications instead of patent registrations were a feature of the 2014 GII. *Changes in absolute data values* have been another factor. These include the decrease in variables such as total value of stocks traded, market capitalization, and market access for *non-agricultural exports* over the 2011–14 period. Also affecting India's ranking is *low data availability* in instances where some indicators for India were not available for a more recent year, revised at the source, or simply not reported. Finally, a *variation in relative performance* (i.e., better performance by other economies in specific indicators) has also been responsible for India's overall change in ranking.

Because India's rank in the GII has gradually declined over years, it may be misconstrued by many that India has performed poorly in terms of its innovation capacity building, but this would probably be a wrong analysis. The GII states that there are certain areas where data could not be captured because of the non-availability of standard international indicators, and even if some of these areas have produced good innovation advantage for a country like India, it

does not translate into ranking. The following section illustrates some of the key areas driven by its evolving policy landscape that have worked well for India, and other areas that need further improvement.

Areas that have worked well and areas that need further improvement

The GII for the last seven years has been consistently publishing the ranking of countries on their innovation capacity and analysing the innovation input and output parameters that affect the relative strengths and weaknesses of nations. In this process, the GII has identified several key factors that have been responsible for better performance for some nations compared with their peers in a specific economic and geographical category. India has been identified as one such innovation achiever in its peer group of lower-middle-income economies in the Central and Southern Asia region. Following are some of the key areas identified by the GII as responsible for relative strengths and weaknesses of India's innovation prowess vis-à-vis its peers.

Areas of strength

This section presents some key areas where India has outperformed its peers in terms of building its innovation capacity guided by an effective policy regime. Some of these—such as information technology and mobile penetration—have been a great success; in these areas, India has performed on par with the best in the world.

Top Indian universities

Over the years, India has developed a stable foundation for scientific, technological, and business education by setting up centres of excellence such as the Indian Institutes of Science (IISC), the Indian Institutes of Technology (IITs), and the Indian Institutes of Management (IIMs). These premier institutions have prospered over time and produced some of the most brilliant minds on the world stage. Admission to these premier Indian institutions has, consistently, been competitive with a '1 out of 50' student admission ratio for IITs,[5] and a '1 out of 150' student success ratio for IIMs; this trend has grown over years. This competition for admission is even fiercer than the competition for admission in the top US schools such as the Massachusetts Institute of Technology (MIT), where the ratio stands at around 1 out of 10 who apply.[6] This competitive landscape and the influx of meritorious students have provided a natural advantage for India, which positions its top institutions as some of the best in the world. Despite many challenges, average scores at top universities in India has been a strong point for its superior innovation ranking, not only among its peers but also among all nations.

Citation of publications

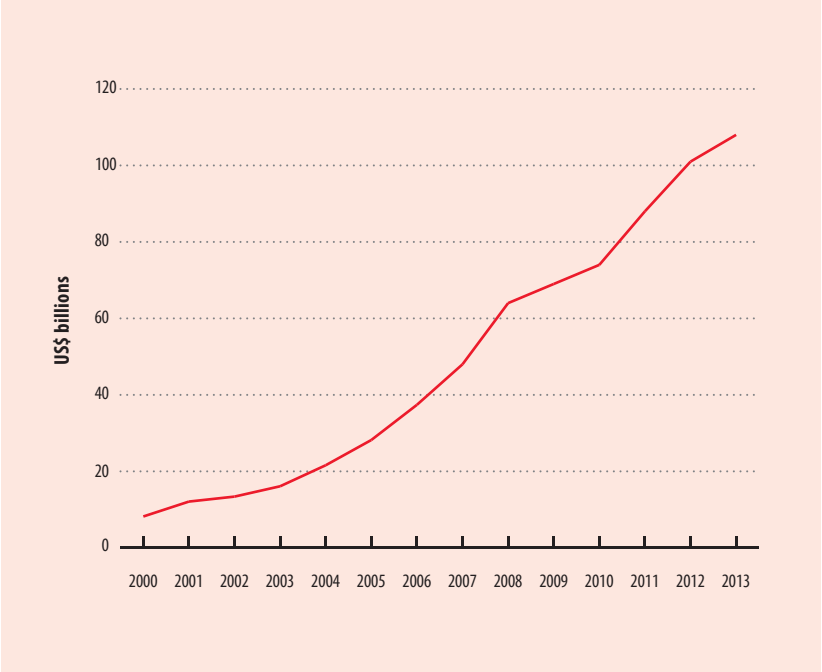
Allied to higher education, the strength of scholarly publications from India has been a key proponent for driving innovation capacity. The higher education sector in India has contributed to the 66% average growth rate in the output of scientific publications as assessed over a five-year period (2006–10). Among all disciplines, engineering research has made the most significant progress, and Indian scientific papers have nearly quadrupled their presence in the top-ranked 1% of journals worldwide. In addition, the improvement of the citation rate (and therefore their impact) in engineering disciplines has been significant, and this level of impact has grown steadily since the 1993–97 period. A government study also indicates that the citation impact of Indian publications has increased from 0.35 in 1981–85 to about 0.68 in 2006–10,[7] which helped India to lead the citation index among its peers.

Mobile networks, information technology, and broadband

The other important segment in which India has leapfrogged, leaving others in its category behind, is its mobile networks, information technology, and broadband. When the first National Telecom Policy was launched in 1994, the telephone density in India was about 0.8 per hundred persons; the world average was 10.0 per hundred persons. This density was even lower than that of other developing countries such as China (1.7 per hundred persons), Pakistan (2.0), and Malaysia (13.0).[8] By 1999 India had achieved some of the targets laid down in the 1994 policy, such as the penetration of one public call office per 522 urban population against the target of one public call office per 500,[9] and establishing 8.7 million telephone lines—even more than the planned target of 7.5 million. In addition, targets were set to achieve a teledensity of 7% and 15% by 2005 and 2010, respectively, and to increase rural teledensity from 0.4% to 4% by 2010. Online electronic commerce was encouraged to pass on information seamlessly with the addition of 10 gigabytes of bandwidth on national routes (expandable up to terabytes in some special cases).[10]

With a penetration of broadband and Internet in the country standing at around 0.02% and 0.40%, respectively, in 2004, the government announced an exclusive policy on broadband.[11] With all these policies in place, the growth of telecommunications connectivity through mobile telephones rapidly expanded

Figure 1: Yearly revenue growth in IT, US$ billions (2000–13)



Sources: Authors' calculations, based on IBEF, 2014; NASSCOM, 2008; and OECD, 2010.

in the next decade. The number of telephone connections surged from 41 million in December 2001 to a staggering 943 million by February 2012, out of which 911 million alone were added via the cellular segment (mobile phones). The increasing teledensity and sharply declining tariffs in a competitive market made India the fastest-growing telecommunications market in the world and placed it far ahead of its peers in the Central and Southern Asian regions. The sector was responsible for almost 3% of country's GDP. The National Telecom Policy 2012 was conceived in this context, with the aim of transforming India into an empowered and inclusive knowledge-based society.[12]

Information technology (IT) in India was a fledgling industry during the 1970s, and few players were active in the market. Over the years the pace of growth in this sector remained faster than in other segments because it did not require much capital to set up a business, and it also provided relatively short lead times to generate revenue. The development of new Indian organizations in this space has grown exponentially in the last two decades, with revenue growth from US$5 billion in 1997 to around US$64 billion in 2007,[13] and to US$108 billion in 2013.[14] The yearly growth in IT revenue from 2000 to 2013 is illustrated in Figure 1.

Recognizing the growing potential of the IT sector in the 1980s, the government opened the sector up to external competition. In the 1990s policies were directed towards developing required infrastructure in telecommunications to support IT growth. As a result, during the period 2000–13, the IT-business process management sector expanded at a compound annual growth rate (CAGR) of 25%, which is three to four times higher than the global average. The IT policy of 2012, by looking at this trend, has put forth the ambitious target of increasing revenue to US$300 billion by 2020. It is also envisaged that this policy will help to scale up innovation and R&D in cutting-edge technologies, provide benefits to small- and medium-sized enterprises (SMEs) and start-ups, create a pool of 10 million skilled workers, and make at least one individual in every household e-literate.[15] With the growth of IT, coupled with the advancement of broadband technologies, access to the Internet grew multifold from 2000 to 2013, at a CAGR of around 32.5%. Annual Internet penetration in India is illustrated in Figure 2.

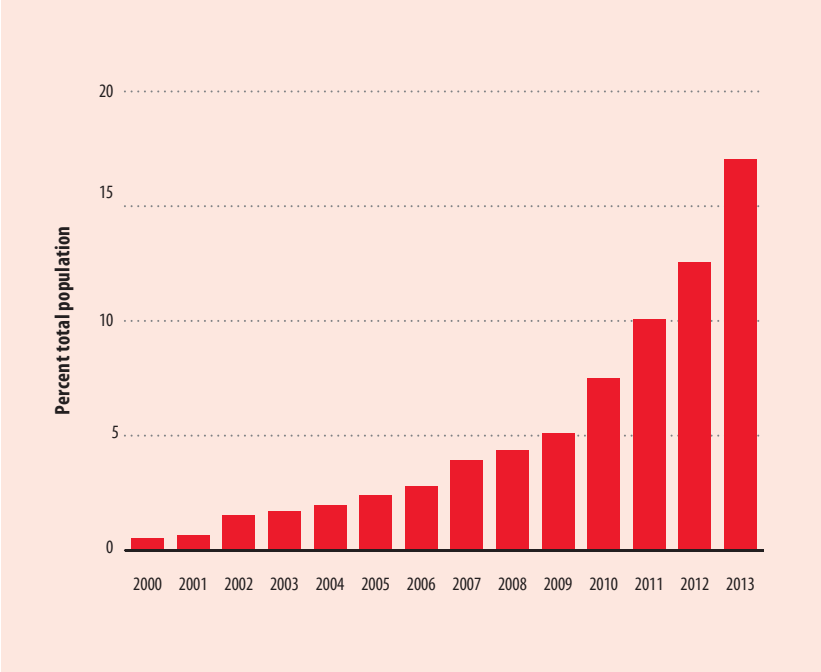
This revolution in communications has affected a pace of knowledge creation and dissemination in the economy that is unprecedented in Indian history. It has helped to transform innovation-driven entrepreneurship from the point of aspiration to the point of reality for the people of India.

Gross capital formation and market capitalization

India, as one of the fastest-growing economies in the world, has demonstrated strengths in factors such as gross capital formation, market capitalization, and total value of stocks traded. India's high GDP growth rate has complemented a strong gross capital formation that consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. After the country's economic liberalization in 1991, Indian industry also posted a high growth trajectory with more and more firms getting listed in the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE),[16] which in turn increased the country's market capitalization over the years. As the volume of the stock

market grew, so did the total value of traded stock. The BSE Sensex, also known as 'BSE 30', is the most commonly used term for referring to the trading volume in India. When compared with the NSE, the BSC has statistics that are similar in terms of total market capitalization, but in terms of share volume, the NSE is almost twice as large as the BSE.[17] The equity market capitalization for BSE from 2011–12 to 2014–15 has risen from US$1,235.05 billion to US$1,626.68 billion, respectively.[18] The other factor that has played a major role in this success is the clear policy guidelines laid down by the Securities and Exchange Board of India for regulating the financial market.

Figure 2: Annual penetration: Percent of population with access to the Internet



Source: Authors' calculations, based on data available in http://www.internetlivestats.com, accessed 30 April 2015.

Areas of weakness

Although India exhibits areas in which it has performed very well and areas that have allowed it to be a successful outperformer in its peer group per the GII classification, the country also has many areas of weaknesses. In this section we will consider three of these weak areas: SMEs, intellectual property rights, and higher education. In all of these areas a much better innovation policy will be indispensable.

Small- and medium-sized enterprises

In India, the SME sector is responsible for 45% of total manufacturing output and employs around 70 million people. The potential of this sector makes it important for realizing the policy target of achieving manufacturing output equal to a 25% share of GDP, an increase from its current level of 16%. Although the SME sector has a high growth potential, its sub-optimal development could be attributed to a lack of adequate cash flow caused by low credit availability in the form of equity as well as debt.[19] This concern is amplified because SMEs have a large number of unregistered units under their purview for which credit is much harder to come.[20] Cluster development in India has traditionally been spearheaded by the Ministry of Micro, Small & Medium Enterprises. The ministry runs an initiative—the Micro & Small Enterprises Cluster Development Programme (MSE-CDP)—that looks at the development of industrial clusters encompassing marketing, exports, skill development, and the setting up of common facility centres; the initiative includes upgrading the technology of enterprises.[21] According to a study released by UNIDO in 2003, around 388 SME clusters across India have been affected by this initiative.[22] Although this has provided a good platform from which Indian SME clusters could grow, it has not been enough to bring a rapid improvement in the sector in terms of fostering R&D-driven innovation. Recognizing this lack of competitiveness in the SME sector as a major impediment, in 2005–06 the government announced the formulation of a National Manufacturing Competitiveness Programme (NMCP) to address firm-level competitiveness. Since this development, the yearly growth of the SMEs has improved marginally. Also in 2011 the National Innovation Council of the Government of India launched a flagship initiative on innovation clusters, at a pilot stage. The innovation cluster programme has thus far successfully piloted only five clusters across India.[23] The overall situation of SME cluster growth in India has remained sub-optimal.

Intellectual property rights

Intellectual property is one of the key indicators of the innovation output of an economy. In India, a persistent contradiction exists between protecting intellectual rights for

commercialization and profitmaking and catering to the social needs and obligations to the poor. Owing to this contradiction, policy and patent laws have been crafted to strike a balance between these two considerations. This has resulted in a relatively weaker intellectual property rights (IPR) regime than those of other developed nations. Figure 3a compares patents filed against patents granted (for Indian, foreign, and total) over a 10-year period. Figure 3b concerns the percentage of patents granted by the Indian patent office and indicates that this percentage has significantly declined over the years, particularly since 2008–09. Figure 3c compares the rate of foreign and Indian patent grants and indicates that, over years, the foreign patent grant percentage is significantly higher than the patent grant percentage in India. Figure 3d contrasts international and domestic patent filings by Indians and shows that the share of international patents filed by Indians is minuscule compared with patents filed in India. This is a worrying situation for an economy like India's, which is striving to grow multifold in the near future and aspiring to become a knowledge-driven economy.

Higher education

Although India's top educational institutions have done relatively well over the years, India is still grappling with some pressing issues in higher education that need immediate attention. With a population of more than 1.2 billion, and with 50% of that population under the age of 25, there is a huge demand for higher education in India. This has resulted in an enormous supply-demand gap, with an enrolment rate of only an 18% in higher education institutions, leaving a large section of the population deprived of educational opportunities after high school. The government is aiming to increase the enrolment rate to 30% by 2020. Other issues that the higher education sector is currently confronted by are poor teacher quality, constraints in research capacity and innovation (owing to low enrolment in PhD programmes, few opportunities for interdisciplinary working, a weak innovation ecosystem in academia, and low industry-university collaboration), and a large socioeconomic disparity.

Conclusions and the way forward

The preceding sections have outlined how India's economic growth has been influenced by its policy regime over a period of time. This section reiterates some of the stronger as well as weaker areas in the economy where India and other nations can learn and benefit from each other. The section also lists key areas that need immediate and sustained policy interventions, and notes some of the recent initiatives undertaken by the government and other stakeholders to improve the country's innovation capacity.

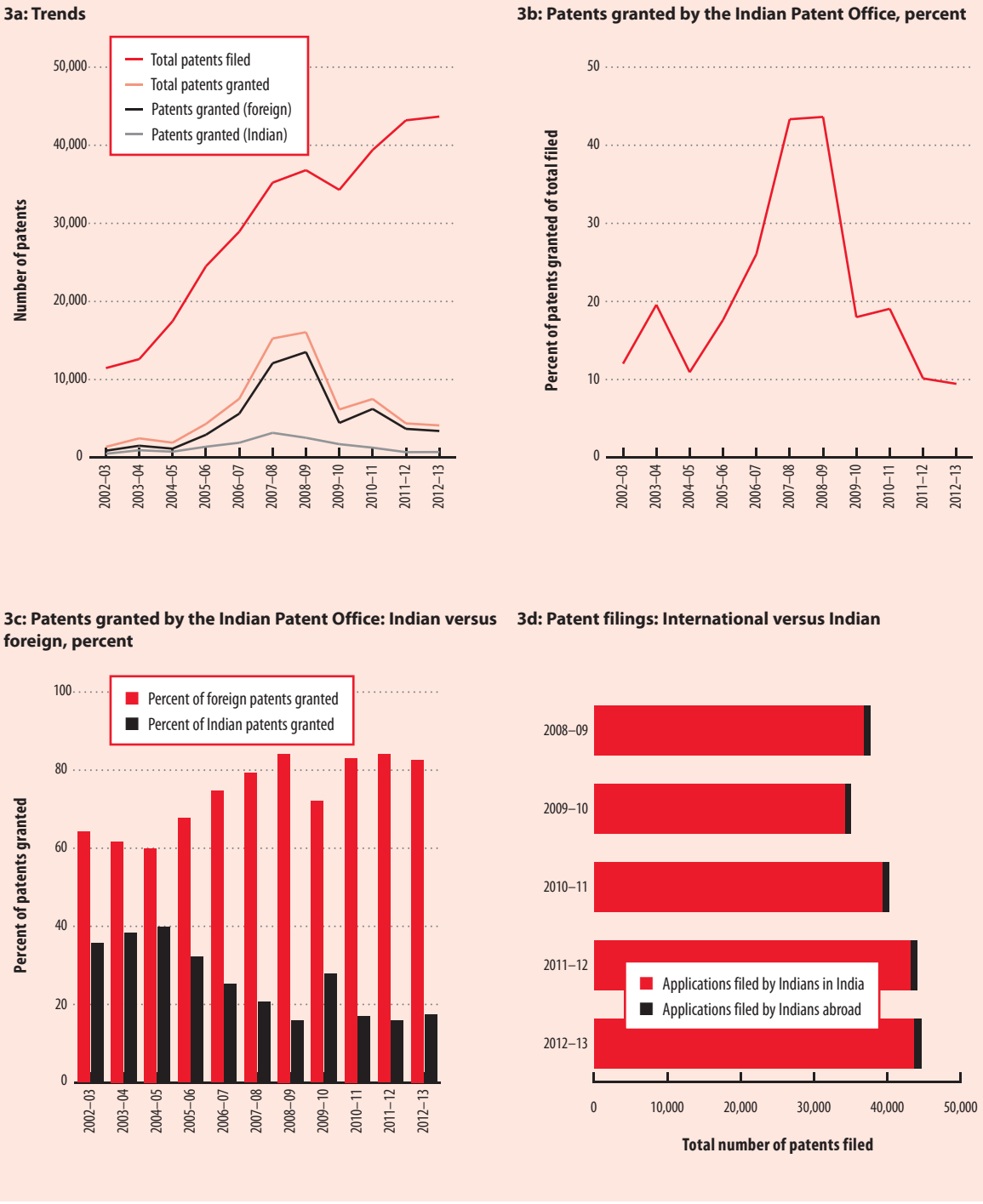
The main areas where India provides an example for rest of the world are in the growth of its ICT regime (mostly mobile penetration) and in its IT and IT-enabled services (ITeS) sector. Previous sections have discussed how, with the implementation of progressive policy measures, these two sectors have emerged to be trendsetters in a span of just two decades. For countries with similar economic and demographic conditions, the India story could be a very useful case study to consider. Many of the lessons India has learned can be adopted to emulate a similar growth experience in a short span of time.

Although ICTs and IT have together comprised a vital differentiating component that increases the pace of the innovation and knowledge development in the economy, their benefit can truly be realized when areas such as higher education, IPR, the regulatory and business environment (which affect the ease of doing business), physical infrastructure (such as railways, roadways, freight transport, etc.), and institutional reforms get appropriate attention and sufficient support from the government. In these key areas India can learn from developed economies about how policy can play a major role for improvement and provide a long-term dividend. The other most important step would be to create entrepreneurship policy at the national and state levels to leverage existing resources effectively.

In light of the above observations, the following are suggested as the primary areas in which government needs to carefully and deliberately formulate robust policy measures to achieve economic growth driven by innovation:

- **Higher education.** As noted earlier, India lacks an adequate number of higher education institutions to cater to its growing number of aspiring students. The level of university-industry collaboration in India is also minuscule compared with that of other developed nations, and there is dearth of high-quality teachers in the education system. The government needs to look into all these aspects carefully while devising a suitable policy for the higher education sector.
- **Industrial innovation.** SMEs are the future growth engines of any economy; an economy is as innovative as its SMEs. In order

Figure 3: Trends in Indian patents



Sources: Authors' calculations based on the Ministry of Commerce & Industry (India), 2013; Statistical Country Profile: India, WIPO database, http://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=IN.

to infuse a culture of innovation and R&D into Indian SMEs, proper fiscal and tax guidelines must be set by the government so that more and more SMEs see benefit in R&D and adopt this as their future business strategy.

- **Entrepreneurship.** As the world economy becomes more volatile and India faces the adverse effects of this economic instability, it is essential for the government to stimulate job creation in the economy far more than usual by devising new methods. This goal can be achieved through building a strong entrepreneurial ecosystem and incentivizing innovation-driven start-ups. Policy concerning entrepreneurship at the national and provincial level needs to be formulated to stimulate this process, which is currently nonexistent.
- **Easing the business environment.** India ranks poorly in terms of its ease of doing business parameters. This will remain a major obstacle that India must address if it is to hasten its economic growth (in terms of its GDP) from its current level of 5–7% to 10% and above. Providing simple regulatory guidelines, moving all processes online, and ensuring less paperwork and less bureaucratic interference will be the key. This can be achieved only through policy-level amendments.
- **Infrastructure development.** Although IT infrastructure in the country has improved by leaps and bounds over the years, the scenario in the physical infrastructure development remains grim. Unless India gears up its infrastructure development—that is, unless it builds good roads and efficient railways (passenger and freight corridors) and modernizes its ports—it will be hard to develop industrial corridors and attract foreign investments. Clear policy guidelines and investment in these sectors will boost the economy and trigger new innovative solutions for existing bottlenecks.
- **Intellectual property rights.** The existing IPR regime in India has traditionally been weak when compared with that of developed economies in terms of protecting new technologies and innovations. The merit of strong, enforced IPR in certain sectors, such as pharmaceutical and biotechology, may be largely debatable when weighing the needs of the business community to protect intellectual property for commercialization and to make a profit with the obligations and needs of the country's large poor population. But India (including its poor) cannot afford to allow a weak IPR regime to remain a long-term barrier for its new entrepreneurs if it intends to fulfil its aspirations of becoming an innovation-driven economy. The government must find ways to study and address this important driver of innovation while restructuring its existing laws and its enforcements.

In 2014 the newly elected Indian government, as one of its first moves, established an aligned Ministry for Skill Development and Entrepreneurship. This is a step forward. With the intervention of the government and the private sector, the level of innovation in Indian industry is also growing and more and more Indian SMEs are coming forward to invest in collaborative R&D. For example, public-private partnership platforms such as the Global Innovation and Technology Alliance, a not–for–profit organization, are opening up opportunities for Indian companies to join with their foreign counterparts and develop products and technology through joint R&D programmes.

To enhance PhD education in the country, in 2013 the prime minister's office launched the Prime Minister's Fellowship Scheme for Doctoral Research, which is unique in its promotion of industrial research. According to this scheme, the government provides 50% of the total cost of a fellowship to students for performing research in a real-time industry environment. Industry provides the rest, and any IPR once created is owned jointly by the student and the industry concerned.[24]

In India's most recent Union (central) budget presented in February 2015,[25] the government placed considerable emphasis on rapid development in the SME sector by addressing the funding issue. It has created a fund of ₹20,000 crore with a credit guarantee of ₹3,000 crore for entrepreneurs in this sector.[26] In addition, it set aside ₹1,000 crore for a Techno-Financial, Incubation and Facilitation Programme to support all aspects of start-up businesses, and other self-employment activities, particularly in technology-driven areas.[27] The Ministry of Micro, Small & Medium Enterprises has launched Intellectual Property Facilitation Centres in different parts of the country with the aim of creating an intellectual property culture within SMEs by looking at protection, capacity building, information services, and counselling and advisory services regarding IPR.

The government is also looking to boost the development of sectors such as infrastructure, transport, smart cities, manufacturing, and

IT to supplement growth. Recently launched schemes such as Make in India and Digital India are steps in this direction. Furthermore, reforms in India's credit delivery mechanism to its poor have been addressed by credit transfer schemes such as Pradhan Mantri Jan-Dhan Yojana, which aims to increase disposable income for India's poor.

Given the unique challenges that India faces, achieving even 40 to 50% of their targets by some of these initiatives will amount to an economic revolution. The momentum is building positively and the time is favourable for India to change gears and get its innovation journey onto the fast track.

Notes

1 The Press Information Bureau, Government of India, released a series of press notes concerning Industrial Policy Highlights. These can be found online at http://eaindustry.nic.in/handbk/chap001.pdf; subsequent versions can be found by adjusting the chapter number in the link.

2 Mohan, 2008.

3 For growth in Pakistan, see Kahn and Khattak, 2014; for growth in Sri Lanka, see Weerasinghe, 2013.

4 EPI, 2014.

5 Basu, 2014.

6 PwC, 2012.

7 Department of Science and Technology, Government of India, 2012.

8 Ministry of Communications & Information Technology, Department of Telecommunications (India), 1994.

9 A public call office (PCO) is a telephone facility located in a public place in India.

10 Ministry of Communications & Information Technology, Department of Telecommunications (India), 1999.

11 Ministry of Communications & Information Technology, Department of Telecommunications (India), 2004.

12 Ministry of Communications & IT, Department of Telecommunications (India), 2012.

13 Gupta, 2010.

14 IBEF, 2014.

15 Ministry of Communications & IT, Department of Electronics & Information Technology (DeitY), 2012.

16 The Bombay Stock Exchange is available at http://www.bseindia.com/; the National Stock Exchange is available at http://www.nse-india.com/.

17 See S&P BSE Equity Market Capitalisation, available at http://www.bseindia.com/markets/keystatics/Keystat_maktcap.aspx?expandable=0'.

18 See http://www.bseindia.com/markets/keystatics/Keystat_maktcap.aspx?expandable=0, accessed 30 April 2015.

19 In India the availability and access to equity and debt for micro business is relatively low compared with that of other developed nations. The entrepreneurial sector is slowly building and gradually policies are being framed that allow creation and access to more such funds by micro businesses and start-ups. See 'Private sector investment for MSME' under 'Financial Resources' Working Group for the Twelfth Five Year Plan (2012–2017) of India's Planning Commission, available at http://planningcommission.gov.in/aboutus/committee/index.php?about=12strindx.htm.

20 For the purpose of collecting data relating to manufacturing activities through a sample survey, all manufacturing units in the country are classified into two broad sectors: registered and unregistered sectors or organized and unorganized sectors (the terms are often used interchangeably). Although the registered manufacturing sector covers the manufacturing units registered under sections 2m (i) and 2m (ii) of the Factories Act of 1948 or under the Bidi & Cigar Workers (Condition of Employment) Act of 1966—that is, the units employing 10 or more workers and using power or 20 or more workers but not using power—the unregistered manufacturing sector covers all +residual manufacturing units. See Section 5, 'Industrial Statistics', from the Ministry of Statistics, available at http://mospi.nic.in/nscr/is.htm.

21 Ittyerah, 2009.

22 UNIDO, 2003; data are taken from http://www.dcmsme.gov.in/clusters/clus/smelist.htm#clus.

23 National Innovation Council, 2013, pp. 19–20.

24 CII, 2014 and 2015.

25 Jaitley, 2015.

26 For details about MUDRA, see http://www.mudra.org.in/faq.php.

27 Ministry of Finance (India), Press Information Bureau, 2015.

References

Basu, S. D. 2014. 'Race to IITs Just Got Tougher; Number of Candidates Who Qualified in JEE Advanced 6,360 More than Last Year'. *The Economic Times,* 20 June. Available at http://articles.economictimes.indiatimes.com/2014-06-20/news/50739176_1_1-26-lakh-students-joint-entrance-exam-iit-seat.

CII (Confederation of Indian Industry). 2014 and 2015. 'Prime Minister's Fellowship Scheme for Doctoral Research'. Available at http://primeministerfellowshipscheme.in/Home.aspx.

Department of Science and Technology, Government of India. 2012. *Bibliometric Study of India's Scientific Publication Outputs During 2001–10: Evidence for Changing Trends.* New Delhi: Government of India. Available at http://dst.gov.in/whats_new/whats_new12/report.pdf.

EPI (Environmental Performance Index). 2014. 'India Ranks 155th on the 2014 Environmental Performance Index'. Press release. Available at http://epi.yale.edu/files/2014_epi_press_release_-_india_.pdf.

Gupta, D. 2010. 'Information Technology Industry in India Growth Structure and Performance'. In *Human Resource Development Practices in Information Technology Industry in India.* PhD thesis, Punjab School of Economics. 138–56.

IBEF (India Brand Equity Foundation). 2014. Indian IT and ITeS Industry Analysis, 31 August. Available at http://www.ibef.org/pages/36252.

Ittyerah, A. C. 2009. *Evaluation Study of Micro & Small Enterprises Cluster Development Programme.* New Delhi: IIPA (Indian Institute of Public Administration). Available at http://www.dcmsme.gov.in/schemes/evaluation_study(MSME)_cluster.pdf.

Jaitley, A. 2015. Budget 2015–2016, speech of Arun Jaitley, Minister of Finance. Available at http://indiabudget.nic.in/bspeecha.asp.

Kahn, J. and N. U. R. Kattak. 2014. 'The Significance of Research and Development for Economic Growth: The Case of Pakistan'. *MPRA Paper* No. 56006, posted 21 May. Available at http://mpra.ub.uni-muenchen.de/56005/1/MPRA_paper_56005.pdf.

Ministry of Commerce & Industry, Department of Industrial Policy and Promotion (India). 2013. *Intellectual Property India: Annual Report 2012–2013.* Office of the Controller General of Patents, Designs, Trade Marks and Geographical Indication. Available at http://ipindia.gov.in/cgpdtm/AnnualReport_English_2012_2013.pdf.

Ministry of Communications & IT, Department of Electronics & Information Technology (DeitY). 2012. *National Information Technology Policy 2012.* Available at http://deity.gov.in/content/national-information-technology-policy-2012.

Ministry of Communications & IT, Department of Telecommunications (India). 1994. *National Telecom Policy, 1994.* Available at http://www.dot.gov.in/telecom-polices/national-telecom-policy-1994.

———. 1999. *National Telecom Policy, 1999.* Available at http://www.dot.gov.in/telecom-polices/new-telecom-policy-1999.

———. 2004. *Broadband Policy, 2004.* Available at http://www.dot.gov.in/telecom-polices/broadband-policy-2004.

———. 2012. *National Telecom Policy, 2012.* Available at http://www.dot.gov.in/sites/default/files/NTP-06.06.2012-final.pdf.

Ministry of Finance (India), Press Information Bureau. 2015. 'Self-Employment and Talent Utilisation (SETU) to be Established'. Press release, 28 February. Available at http://pib.nic.in/newsite/PrintRelease.aspx?relid=116187.

Mohan, R. 2008. 'The Growth Record of the Indian Economy, 1950–2008: A Story of Sustained Savings and Investment'. *RBI Bulletin* March: 373–97.

NASSCOM. 2008. Indian IT-BPO Industry: NASSCOM Analysis Factsheet. Available at http://www.almamate.in/pdf/IT_Industry_Factsheet_2008.pdf.

National Innovation Council (India). 2013. *Report to the People: Third Year.* New Delhi: National Innovation Council. Available at http://innovationcouncilarchive.nic.in/images/stories/report/rtp2013/Report%20to%20the%20People%202013%20-%20National%20Innovation%20Council%20(English).pdf.

OECD (Organisation for Economic Co-operation and Development). 2010. *The Information and Communication Technology Sector in India: Performance, Growth and Key Challenges.* Unclassified Document JT03286352. Available at http://www.oecd.org/sti/ieconomy/45576760.pdf.

PwC (PricewaterhouseCoopers). 2012. *India - Higher Education Sector: Opportunities for Private Participation.* Available at https://www.pwc.in/en_IN/in/assets/pdfs/industries/education-services.pdf.

UNIDO (United Nations Industrial Development Organization). 2003. 'Methodology and the Action Plan for Updation on SME Industrial Clusters.' Compiled by UNIDO Focal Point, CDP UNIDO, 14 November. Available at http://www.dcmsme.gov.in/clusters/unido/methcludata.htm#basic.

Weerasinhghe, M. C. 2013. 'R&D Country Profile: Sri Lanka'. Presentation for the Consultative Expert Working Group on Research and Development: Financing and Coordination. Bangkok, Thailand, 25–26 July 2013. Available at http://www.searo.who.int/entity/intellectual_property/about/strategy/23bDrManujandDrAnton.pdf?ua=1.

Effective Innovation Policies for Development: The Case of Kenya

Bitange Ndemo, University of Nairobi

Over the past 10 years Kenya has made a stunning innovation journey in which the country's youths have played an important role. The government has responded to the clear desire of Kenya's youth to engage in innovation with new policies and increased funding for research and development (R&D) as a strategy for creating jobs and supporting innovation.

Pressure from a rapidly growing population, scarce resources, and soaring unemployment are driving the government to seek new avenues of job creation. Kenya's Vision 2030,[1] a long-term blueprint for development, estimated that the economy would need to grow at a rate of 10 percent for 20 years in order to effectively mitigate social, economic, and political problems. The country's economic growth rate has, however, been slowed by political instability and a host of international factors such as high oil prices and declining tourism.

This chapter focuses on recent innovation policies and systems in Kenya intended to address these issues, paying special attention to what has worked and what has not in relation to the Global Innovation Index (GII). The chapter begins by explaining Kenya's focus on innovation, followed by a review of innovation policies in the country. It reviews Kenya's position in the GII rankings and examines which policies have been effective, and which have not. Challenges at both the policy and operational levels are evaluated and used to inform a review of educational reforms in the country. To reinforce the conclusions presented, lessons are drawn from the United States of America (USA) and the Republic of Korea, and Kenya's own strengths in innovation are highlighted.

Kenya's path to recovery

In spite of Kenya's many challenges, there are some indications that the economy may be on a recovery path towards its 10 percent target growth rate. The 2015 World Bank's *Global Economic Prospects* report raised Kenya's economic growth forecast to 6 percent in 2015 and 6.6 percent in 2016, up from previous projections of 4.6 percent and 5 percent, respectively.[2] These projections are higher than Sub-Saharan Africa's average projected growth rate of 5.1 percent. The World Bank report indicates that higher spending on infrastructure, recovery of the agricultural sector, and falling oil prices are key to Kenya's economic expansion. The economy will remain strong in the near term as a result of the country's strong private sector and market-friendly policies.

On the socio-political front, a constitutional dispensation implemented in 2010 has brought several important reforms.[3] The new constitution provides Kenyans with a bill of rights guaranteeing fundamental freedoms and equal opportunity for all—including women, who had previously experienced diminished legal status. The country is improving access to social services—such as education and healthcare—for both urban and rural populations, as a way of combating inequality. With devolved governance and a fairly stable political environment compared with many other African countries, Kenya is in a better position to leverage innovation.

Unemployment is perhaps the country's greatest threat to stability, especially with the recruitment of idle youth into terror groups such as Al Shabaab. But, ironically, the need for jobs is precipitating innovation. *The Guardian* reports on an innovative project called 'LivelyHoods' that began in Nairobi's Kawangware slum. The project creates employment opportunities by training youths to sell products tailored to the needs of their communities. The scheme's iSmart brands include fuel-efficient cookstoves (more than 3,233 of which had been sold by 2014), as well as solar lamps and reusable sanitary products for women. All the products are vetted for their suitability by LivelyHoods representatives and potential customers.[4]

Similar innovative products are being developed in other sectors, including the quickly expanding information and communication technology (ICT) field. Kenya is

becoming a leader in ICT innovations in Africa.[5] For example, the successful commercialization of mobile money in Kenya such as M-PESA has led to increased understanding of the potential for innovation to deal with local problems. Many youths have sought to duplicate the success of mobile money products and platforms. This large, educated, tech-savvy but unemployed youth population has attracted global multinational corporations to Kenya. A number of these multinational firms have set up research facilities in the country, which will continue to drive innovation.

Innovations, especially in the agricultural sector, have also led to greater productivity and contributed to the country's growth. For example, applications such as iCow (an agricultural information service) and M-Farm (a market information service) have greatly improved productivity in the livestock and agricultural sectors, respectively.[6] A recent rebasing of the economy established that the size of Kenya's economy was 25 percent larger than previously believed, making it the 5th largest economy in Sub-Saharan Africa—behind only Nigeria, South Africa, Angola, and Sudan. Some studies attribute Kenya's growing economy largely to ICTs.[7]

Innovation policies in Kenya

Kenya's first innovation policy was launched in 2006 with the implementation of the Vision 2030 initiative. The policy declared that Kenya would break from the past and start doing things differently. The Vision 2030 discourse centred on institutional reforms, human resource development, and enhanced R&D as well as improved science and technology infrastructure. An emphasis was also placed on pursuing more and better collaborations and partnerships. The Ministry of Education, Science and Technology was created to spearhead capacity building and innovation.

The creation of this ministry led to the development of several institutions that support innovation, including the National Commission for Science, Technology and Innovation; the Kenya National Innovation Agency; and the National Research Fund. Another key institution within the innovation ecosystem is the Kenya Education Network, which facilitates the sharing of educational and research resources through a government-subsidized national broadband network; it also serves as the National Research and Education Network.

In 2009, a comprehensive policy on Science, Technology, Innovation Policy and Strategy (STIPS) was developed. STIPS sought to mainstream the application of science, technology, and innovation in all sectors and processes of the economy to ensure that Kenyans benefit from all available capacities and capabilities in order to achieve the objectives of Vision 2030. STIPS prioritized several areas for intervention, including agriculture and rural development; health and life sciences; trade and industry; human resource development; physical infrastructure; energy, environment, and natural resource management; and ICTs.

The 2010 constitution also recognizes the role of indigenous innovations in development. Article 11, Section 2b and c of the constitution reads: '… recognise the role of science and indigenous technologies in the development of the nation; and promote the intellectual property rights of the people of Kenya.'[8] To operationalize the constitutional requirement for the recognition of indigenous knowledge, a sessional paper on science and technology was published and, in 2012, the Science, Technology and Innovation Act was enacted.[9]

Since the progress that has been made in both policy and institutions, research and innovation have begun to advance in Kenya. Universities are competing to set up software and hardware incubation centres that would link them to industry. The University of Nairobi and Strathmore University have track records of successful incubation programmes that have led to the commercialization of their research outputs. And, for the first time, corporate Kenya has begun investing in some of these incubation programmes.

After success with Ushahidi, an open source software developed in Kenya for information collection, visualization, and interactive mapping,[10] the premier innovation hub I-Hub has branched off from software to hardware and is coming up with their first product, a connectivity device called 'BRCK'. BRCK was designed and prototyped in Nairobi. It was meant to solve local problems of erratic electricity and Internet in both rural and urban areas, but it has also found its way to new markets in much the same way that the mobile money transfer innovation M-PESA has found its way into markets beyond its original target. The success of BRCK has led to the establishment of a prototyping technology shop in Nairobi, the first of its kind in Kenya. This will help small and medium-sized enterprises (SMEs) create new products and introduce them to the market.

The most innovative products in different sectors are being facilitated by ICTs, with examples in agriculture, manufacturing, health, and financial services. Most of these products seek to improve productivity. For example, the service iCow,

which provides livestock farmers with information, aimed to—and succeeded in—greatly improving dairy production in Kenya. Whereas in the past it was difficult to even explain terms such as 'productivity' to farmers, these new applications have made it possible to do so.

Perhaps the most important development in research and innovation is the fact that all universities now have a senior staff member, at the level of deputy vice-chancellor, who is in charge of research. This has resulted in the development of supporting infrastructure. For example, Jomo Kenyatta University of Agriculture and Technology has put up an Industrial Technology Park for research output. Kenyatta University has its Manu Chandaria Incubation Centre; the University of Nairobi started C4DLab (a software incubation centre) and will soon start its own science park, which will focus more on its fab lab, in conjunction with the Massachusetts Institute of Technology (MIT). Konza City Technology Park is also underway and will harmonize university research activity with industry and government.[11] Most universities are collaborating with international partners to enhance knowledge transfer while, at the same time, providing new solutions.

Multinational corporations are also setting up research labs in Kenya to expand their own research reach, while getting closer to the source of unique problems. For example, IBM is collaborating with the Kenyan government to create innovations around big data and the next generation of government.

Kenya in the Global Innovation Index

Kenya climbed up the rankings in the GII, rising from 99th position in 2013 to 85th in 2014. The country's efficiency levels also greatly improved, leaping from 71st position in 2013 to 26th in 2014. These improvements can be attributed to innovative applications of ICTs in various sectors. The financial sector is about to experience a tremendous transformation as a result of the 2015 partnership between Kenya Commercial Bank (KCB), the largest bank in the country, and Safaricom, the largest mobile network operator and the owner M-PESA. These partnerships will enable mobile customers to access credit of up to 1,000,000 Kenyan shillings (US$11,000) without actually having to go to the bank or provide security. Equity Bank, another large bank, has also acquired a mobile virtual network operator license to compete with the Safaricom/KCB partnership. Such initiatives contribute to Kenya's stellar performance within its region in the GII, especially in market and business sophistication, which is measured in credit availability, investments, trade, and competition.

The GII 2014 ranks Kenya 1st among the 17 low-income Sub-Saharan economies at different levels of development included in the sample. Table 1 shows that what Kenya spends on R&D (as a percentage of GDP) is higher than all other Sub-Saharan Africa countries. In terms of absolute expenditure, it ranks 3rd after South Africa and Egypt.

The last few editions of the GII have shown the great progress that Kenya has made in using innovation to boost its potential. To take advantage of the progress it has already made, Kenya—as well as other African countries—need to improve institutions, build human capital, invest more in innovation infrastructure, create an enabling environment for knowledge and technical and creative output, and continue to embrace a free market economy to encourage greater market and business sophistication.

Table 1: Gross domestic expenditure on research and development (GERD), 2010

Country	Survey year	GERD (PPP$ millions)	GERD (% of GDP)	GERD per capita (PPP$)
Burkina Faso *	2009	38.10	0.20	2.38
Egypt *,†	2011	2,223.35	0.43	26.94
Ethiopia †	2010	208.74	0.24	2.51
Ghana	2010	150.20	0.38	6.16
Kenya	2010	652.00	0.98	16.09
Senegal	2010	130.50	0.54	10.50
South Africa	2010	4,021.3	0.76	80.21
Uganda	2010	237.80	0.50	7.11

Source: Adapted from NPCA, 2014; data from ASTII R&D surveys 2010 or latest year available; GDP, PPP, and population data sourced from the African Development Bank.

* Data not disaggregated by sector; † GERD does not include private non-profit R&D expenditure.

What has worked and what has not?

The innovation witnessed in Kenya has largely taken place outside official innovation policy, which was crafted after some sectors had already begun considerable innovation efforts. In many ways, the policy framework is catching up to what is already a work in progress.

The agricultural and health sectors in Kenya have a long history

of R&D as well as of creating new products. The ICT sector came late to innovation, but it has had a greater impact than other sectors. Innovation in Kenya is driven by pockets of institutions that either have a history of R&D or are led by individual risk takers. Institutions such as the Kenya Agricultural Research Institute, the Kenya Industrial Research and Development Institute, and the Kenya Medical Research Institute, as well as research into tea and coffee development, all have great traditions of research and innovation.

The emerging ICT innovation hubs, however, are driven by a few individual risk takers, both in government and industry. The success of the crisis-mapping software Ushahidi and the mobile money platform M-PESA, for example, has attracted other innovators. A group of young developers going by the name 'skunkworks' began to organize BarCamps around Nairobi to share their innovations; this eventually led to the creation of development hubs. Later, corporations joined in by financing the development of some applications for the mobile platform. Aid agencies also began to fund Hackathons, which attracted large numbers of youths keen on showcasing their innovations. But these rapid innovations, encouraged by greater capacity for technology diffusion, occurred before the country had a relevant policy framework in place, and in fact, the emerging innovation community did not pay attention to these developments when they did finally happen. Although it was a policy framework intended for all sectors, awareness of it has largely remained within the Ministry of Science and Technology and a few research institutions.

The ICT sector did benefit from the government's launch of the Kenya Open Data initiative and the willingness of the Ministry of Information and Communication (MOIC) to work closely with the developer community. These relationships have produced various innovation hubs—including I-Hub, I-Lab, and A-Lab—from which flowed innovations beneficial to a cross-section of economic sectors. Through their mentoring programmes, events, and training, and by providing Internet access and office equipment, the hubs are supporting innovative local developments not only in the ICT and creative industries, but also in other sectors such as renewable energy (for example, with Negawatt Challenge, a competition aimed at finding new energy solutions) and agriculture (with market information applications such as M-Farm, noted earlier).[12]

The MOIC also adopted public-private partnerships as a strategy to ensure knowledge transfer and modernize Kenya's industrial sector. Consequently, multinational companies such as IBM have set up research labs in Kenya to exploit big data and develop new applications that would run the next generation of government. Through the Vision 2030 objectives, the MOIC started to encourage start-ups and accelerator programmes through incubation at various institutions of higher learning. This approach has already borne fruit: it was through this incubation programme that the idea of the Konza City Technology Park, discussed earlier, was conceived.

Through its Ministry of Industrialization and Enterprise Development (MOIED), the government has set up a Micro and Small Enterprise Authority (MSEA) aimed at restructuring the sector by mainstreaming small businesses and encouraging entrepreneurship. The MSEA began operating in 2013, but has yet to have its desired impact. The MOIED is critical, as it is responsible for facilitating tax incentives at technology parks. Volunteer academics encourage entrepreneurship in the innovation hubs, helping start-ups to move their ideas to the market.

In 2013 the Government of Kenya, through the Ministry of Labour, Social Security and Services came up with a policy document (Sessional Paper No. 3) to operationalize productivity improvement programmes initiated by the government in order to achieve Vision 2030.[13] This policy document contains specific and targeted interventions. Key proposals include the establishment of a National Productivity Council to facilitate inter-sectoral coordination of policy and programmes, initiatives of the public and private sectors, and enactment and implementation of a Productivity Management Act to guide productivity management efforts in the country.

Challenges

Key challenges to the Kenyan innovation system appear on two levels: policy and operational. This section evaluates these challenges and then uses this evaluation to inform a review of Kenya's educational reforms.

Policy level

Despite the existence of a policy framework, challenges hindering adoption of innovation as a key driver for economic growth still exist. In the period 2007–12, resource allocation to R&D was prioritized as a basis for achieving Vision 2030. However, that momentum has since dissipated as a result of the lack of a national commitment to leverage innovation for greater economic expansion. Resource allocation to

R&D is often not guaranteed, and the little that is allocated to research institutions is spent on recurrent expenditures.

Serious coordination gaps continue to undermine innovation. These include a lack both of central coordination of R&D and of advocacy for multidisciplinary research. Even within the government, research is undertaken largely in silos, leading to capacity underutilization. This lack of coordination means that SMEs do not have the R&D support necessary to bring new products to market. The situation is further complicated by the fact that technical, industrial, and vocational education training institutions (TIVETs) are declining, as some have been converted into universities. There is now, however, a policy initiative to create a TIVET Authority and build new institutions.[14]

A report on the Kenya National Systems of Innovations (KNSI) by the United Nations Industrial Development Organization (UNIDO) confirmed these challenges and arrived at the following conclusions:

- connectivity between the core actors of the KNSI is fragile;
- the KNSI has an asymmetric distribution of actor links;
- certain imbalances are present in the directionality of actor relationships;
- significant latent barriers to innovation are uncertainty avoidance, risk, unsophisticated markets, and skills capacity; and
- extant policy instruments face limitations in overcoming the constraints of the barriers to innovation.[15]

UNIDO's conclusions are not new, but Kenya is beginning to have the capacity to address them, as can be seen in the country's rise in the GII rankings.

Operational level

At the operational level, the disconnect between industry and research institutions undermines innovation. While industry complains that graduates from local universities are not ready for industry, universities complain that they are not getting enough feedback from industry. Some leading firms, especially in the ICT sector, are filling the ICT skills gap of workers by providing bridging courses and offering internships. Some universities have also begun incubation centres to nurture emerging entrepreneurs.

Often the main challenge for incubation hubs is determining ways to make potential beneficiaries aware of the opportunity and how to take advantage of it.[16] This requires specialized skills and experience in order to understand the demand patterns, business models, and market intelligence. Unfortunately, those in Kenya with this skill set are older-generation Kenyans who tend to dislike the tech-savvy youths. But for these hubs to succeed, both groups must find a way to work together. Having been in the midst of the creation of incubation centres, I have observed this first-hand.

Educational reforms

Over the past 20 years, tertiary education in Kenya has been reduced to almost nothing. Most TIVET colleges were converted to universities without building new institutions. The education system needs to place more emphasis on science, technology, engineering, and mathematics (STEM) disciplines and to build a network for manufacturing innovations similar to the USA's Educate to Innovate programme.

In Kenya the policy framework of 2009 has created a Technical Education and Vocational Training Authority to coordinate tertiary education in the country. A National Observatory for science, technology, and innovation is to be created to enhance sharing of knowledge, policy formulation and policy implementation. Unfortunately, this multiplicity of new institutions may, in the end, be Kenya's greatest barrier to innovation: other countries have tried this model and failed.

Lessons from Kenya and beyond

This section draws lessons from the USA and the Republic of Korea, and concludes by highlighting Kenya's own strengths in innovation. The USA provides great lessons because partnerships already exist between US universities such as MIT and local universities for developing new products using the fab lab technologies. The Republic of Korea too has had a very close technical relationship with Kenya; many Kenyans have gone through the Korean Institute of Science and Technology, which has played a key role in the country's development.

The United States of America

Kenya can learn a lot from the USA's TechShop concept. This new approach to building a community of innovators is increasingly becoming the playground for innovation in the USA. TechShop centres, sometimes referred to as 'hackerspace' or 'learning centres', provide tools and space for fabrication and prototyping, as well as classes. They are equipped with comprehensive tools and software and participants can make virtually anything.

Dickel et al., in their 2014 study of TechShops, concluded that:

> … by applying the concept of real-life laboratories to the analysis of shared machine shops and the developments that emerge in this context, this article considers the subject of this special issue as a promising example that embodies significant properties of a reflexive innovation society. It provides evidence for novel modes of innovative and creative action that is based on hybrid forms of collaboration, the bottom-up coordination of collective action and a strong notion of accessibility and openness.[17]

I-Hub has begun to test the TechShop concept to enhance innovation capabilities in the realm of hardware, which has not yet been exploited in Kenya. The University of Nairobi's collaboration with MIT and other similar arrangements provides the best chance for Kenya to successfully transfer knowledge from the USA. Kenya is poised to apply this new and innovative concept.

The Republic of Korea

The Organisation for Economic Co-operation and Development (OECD), in its 2014 evaluation of industry and technology policies in the Republic of Korea, noted that the country has one of the best and more comprehensive R&D programmes in the world. The programme itself enables the government to accept greater risk in publicly supported R&D, and the country's higher tolerance for risk continues to pay off.

As in Kenya, Korean SMEs and research institutions tend to shy away from intense collaborations with academic institutions. To overcome this problem and enhance the commercialization of research, the Republic of Korea is establishing a more business-friendly education system that addresses cultural and other barriers to start-ups. The education system also aims to address issues of collaboration between businesses and research institutions, giving systematic support for public-private innovation partnerships and inspiring the development of highly trained students to support industrial innovation and to encourage students to join innovation-oriented companies, SMEs in particular. Furthermore, the Republic of Korea is encouraging more start-up creation and SME growth through tax credits to enhance radical innovation.

As Kenya considers reforms to its education system, it might look at the example of the changes made to the Korean education system coupled with their military service perhaps fosters a culture of risk taking and innovation. There is need for Kenya to emulate Korea and more importantly R&D and encourage innovation.

Kenya

Although the country is just beginning its innovation journey, other emerging economies can still learn something from Kenya, including the benefits of using deliberate policy interventions; of leadership in government with an appetite for risk taking; of the construction of collaborations and partnerships with the private sector including multinational corporations; of increasing funding research; and of the development of incubation centres across universities to foster innovation. Relative to other African countries, some of Kenya's strengths lie in its current expenditure on education, relatively easy access to credit for individuals, increasing R&D spending, and intensity of local competition (Kenya is a free market economy where competition is encouraged). These variables positively influence innovative capacity.

Research by Koria et al. shows a comparative analysis of determinants of the effectiveness and efficiency of the Ghana National System of Innovation (GNSI) and the Kenya National System of Innovation (KNSI).[18] Two regression analyses were performed of the innovativeness of business enterprises and of the strength of linkages between research institutes and the production system with respect to an array of independent variables of the countries' national systems of innovation. The research established that actor linkages and ICT affect the GNSI positively, while they affect the KNSI negatively. Ghana presents a good case study of the impact of these linkages.

Conclusions

Relative to other countries in Africa, Kenya is making solid progress in innovation—but a great deal more needs to be done. It has developed a comprehensive innovation policy framework, but the relationships between research institutions and industry remain disjointed. The government has played an important role in creating an effective triple helix that will eventually harmonize innovation programmes for greater economic growth, but the communication of policy to innovation actors must be enhanced. Kenya should also learn from countries such as the USA, where the concept of the TechShop is helping to develop communities of innovation, and the Republic of Korea, where R&D activities are supported by the government to enhance greater risk taking, producing great benefits.

Furthermore, extending tax credits to research activities by the private sector would facilitate greater innovative capabilities. There is also a need to review the education system, to encourage the establishment of more TIVETs and business-friendly educational programmes, and to

foster greater collaboration between industry (specifically SMEs) and research institutions.

Notes

1 Government of Kenya, 2007. For details about Kenya's Vision 2030, see http://www.vision2030.go.ke/.

2 World Bank, 2015.

3 Sihanya, 2012.

4 Roopanarne, 2014.

5 Saine innovation network, 2013; World Bank, 2010.

6 For details about iCow, see http://icow.co.ke/; for information about M-Farm, see http://www.mfarm.co.ke/.

7 For example, see World Bank, 2010.

8 Government of Kenya, 2010.

9 Government of Kenya, 2013a.

10 For more information about Ushahidi, see http://www.ushahidi.com/product/ushahidi/.

11 Information about these industrial and incubation centers can be found at the following websites: http://www.c4dlab.ac.ke/; http://www.ku.ac.ke/chandaria-biic/; https://www.fablabs.io/universityofnairobi; http://media01.24hrstech.com/PDFs/10A-Review_of_UoN_Science_and_Tech_Park.pdf; http://www.jkuat.ac.ke/industrial-park-to-foster-industrialization/; and http://www.konzacity.go.ke/.

12 Information about Negawatt is available at http://www.negawattchallenge.com/about/; information about M-Farm is available at http://www.mfarm.co.ke/.

13 Government of Kenya, 2013c.

14 Government of Kenya, 2013b.

15 UNIDO, 2014.

16 Having been in the midst of the creation of incubation centres, I have observed this first-hand.

17 Dickel et al., 2014, p. 16.

18 Koria et al., 2014.

References

Dickel, S., J. Ferdinand, and U. Petschow. 2014. 'Shared Machine Shops as Real-Life Laboratories'. *Journal of Peer Production Issue 5: Shared Machine Shops.* October. Available at http://peerproduction.net/issues/issue-5-shared-machine-shops/.

Government of Kenya. 2007. *Kenya Vision 2030: The Popular Version.* Nairobi: Government of Kenya.

Government of Kenya. 2010. *Constitution of Kenya, Revised Edition 2010.* Nairobi: National Council for Law Reporting with the Authority of the Attorney General. Available at https://www.kenyaembassy.com/pdfs/The%20Constitution%20of%20Kenya.pdf.

Government of Kenya. 2013a. *Kenya Gazette Supplement No. 43 (Acts No. 28). The Science Technology and Innovation Act, 2013.* Nairobi: Government of Kenya.

Government of Kenya. 2013b. *Kenya Gazette Supplement No. 44 (Acts No. 29). The Technical and Vocational Education and Training Act, 2013.* Nairobi: Government of Kenya.

Government of Kenya. 2013c. *Sessional Paper No. 3 of 2013 on National Productivity Policy. Ministry of Labour, Social Security and Services.* Nairobi: Government of Kenya.

Koria R., F. Bartels, L., Andriano, and S. Koeszegi. 2014. 'Effectiveness and Efficiency of National Systems of Innovation: The Importance of ICT: The Cases of Ghana and Kenya'. *IST-Africa Conference Proceedings*, Le Meridien Ile Maurice, 7–9 May, 2014.

NPCA (NEPAD Planning and Coordinating Agency). 2014. *African Innovation Outlook 2014.* Pretoria: NPCA.

OECD (Organisation for Economic Co-operation and Development). 2014. *OECD Reviews of Innovation Policy: Industry and Technology Policies in Korea.* Paris: OECD Publishing.

Roopanarne, L. 2014. 'Kenya's Unemployed Youth Find Fresh Hope in the Form of LivelyHoods'. *The Guardian, Poverty matters blog,* 5 January. Available at http://www.theguardian.com/global-development/poverty-matters/2014/jan/05/kenya-unemployed-youth-fresh-hope-livelyhoods.

Saine innovation network. 2013. 'Kenya and South Africa Leading Innovation in the African Continent'. Saine post. Available at http://www.saine.co.za/wordpress/kenya-and-south-africa-leading-innovation-in-the-african-continent/.

Sihanya, B. 2012. 'Constitutional Implementation in Kenya, 2010–2015: Challenges and Prospects'. *FES Kenya Occasional Paper* No. 5. Nairobi, Kenya: Friedrich-Ebert-Stiftung.

UNIDO (United Nations Industrial Development Organization). 2014. Progress Report of the Kenya National System of Innovation.

World Bank. 2010. 'At the Tipping Point? The Implications of Kenya's ICT Revolution with a Special Focus on Mobile Money'. *Kenya Economic Update* December, Edition 3. Nairobi: Poverty Reduction and Economic Management Unit Africa Region, World Bank.

World Bank. 2015. *Global Economic Prospects: Having Fiscal Space and Using It.* Washington, DC: World Bank Group.

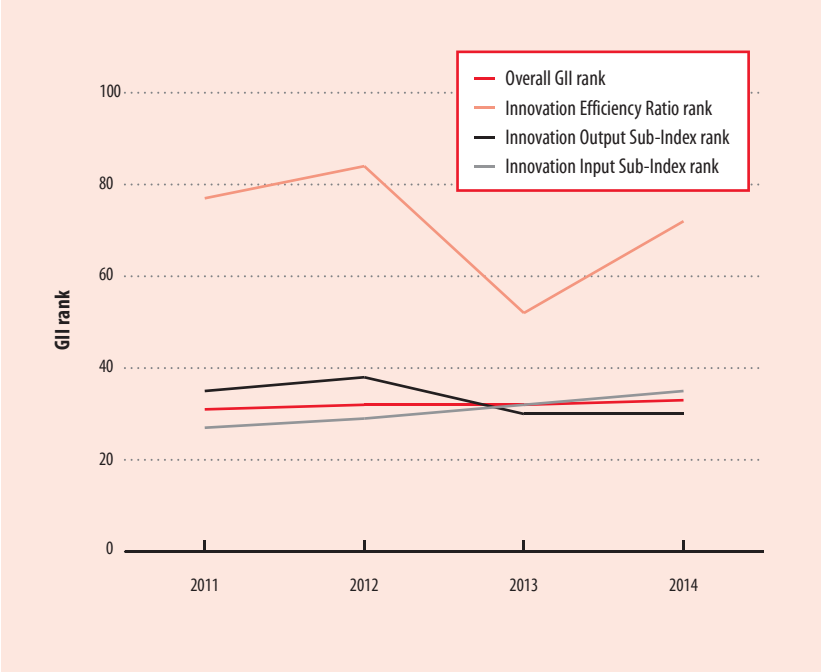
Innovation Performance of the Malaysian Economy

Rajah Rasiah and **Xiao-Shan Yap**, University of Malaya

On the back of political stability, inflows of foreign direct investment, and export-oriented industrialization, Malaysia has successfully transformed itself into an upper-middle-income country. It had a population of 29.2 million and purchasing power parity–based GDP per capita of US$17,748 in 2014. Malaysia has been an innovation achiever over the period 2011–2014, as seen in improvements to its Global Innovation Index (GII) score relative to its GDP. Furthermore, Malaysia's remarkable innovation performance led it to record the highest GII rank among the middle-income countries in 2014.

Malaysia has remained an upper-middle-income country since the 1980s. Because the government is seeking to advance the country to the high-income group by 2020, it is attempting to determine the causes of this long stagnation so that it can intervene effectively. The slow pace of GDP growth since 1997 is largely a consequence of poor performance on the efficiency ratio of innovation inputs and outputs. Despite achieving an innovation efficiency score of 0.8, Malaysia ranked 72nd in the world in 2014. Indeed, this is a major concern of the government, which has attempted to raise the performance of innovation expenditure in the country by emphasizing commercialization and training programmes.

Figure 1: Global Innovation Index: GII and sub-index rankings: Malaysia, 2011–14



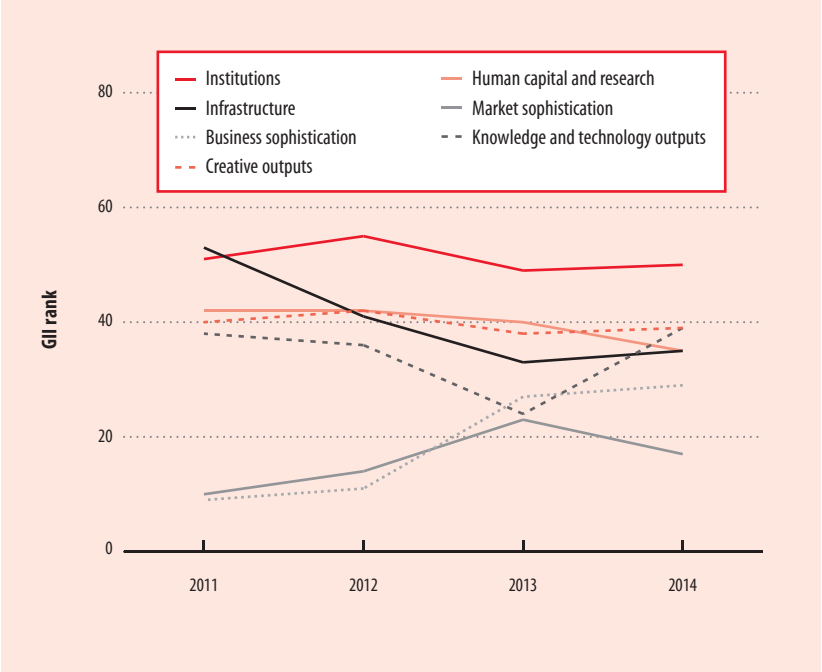
Source: GII, 2011–2014.

As an innovation outperformer, Malaysia offers an excellent example of an upper-middle-income country that has done well in areas such as business financing of innovation and commercialization, as well as Market and Business sophistication. At the same time, however, considerable improvement in areas such as knowledge-based activities and technological dependence are still needed. This chapter seeks to analyze the reasons behind Malaysia's achievements and shortcomings, and to offer policy-relevant recommendations for advancing innovation in the country.

Malaysia's performance in the GII

Malaysia placed 33rd among all countries in the GII in 2014, slightly below the 31st rank it achieved in 2011 (Figure 1). Its rankings on innovation inputs and innovation outputs were 30th and 35th, respectively. However, it did not perform well on the efficiency of innovation last year, placing only 72nd. Although Malaysia's overall

Figure 2: GII pillar rankings: Malaysia, 2011–14



Source: GII, 2011–2014.

GII rank did not change much over the period 2011–14, its actual score improved from 44.1 in 2011 to 46.9 in 2013–14. Malaysia's innovation efficiency rank fell from 52nd in 2013 to 77th in 2014, but its actual score improved significantly—from 0.7 in 2011 to 0.8 in 2013–14. The relative fall in rank is a consequence of other countries improving their scores much more than Malaysia.

Among the seven main pillars of the GII, Malaysia ranked 17th in Market sophistication with an aggregate score of 63.9 (see Figure 2). Malaysia's worst performance was in the Institutions pillar, at 50th (with a score of 68.2). It came in 39th in both Knowledge and technology inputs (35.5) and Creative outputs (40.0) with a score of 42.0, and 35th in Human capital and research (41.6) and Infrastructure (45.7). It did better in Business sophistication, ranking 29th with a score of 42.9.

Overall, Malaysia has done well in all the direct variables relevant to innovation, such as innovation inputs and outputs. However, despite strong commercialization in business research and development (R&D), including in business financing, the country's relatively poor performance in innovation efficiency indicates a need to review government policies concerning the implementation of government-sponsored R&D funds in the country.

Government policies that promote innovation

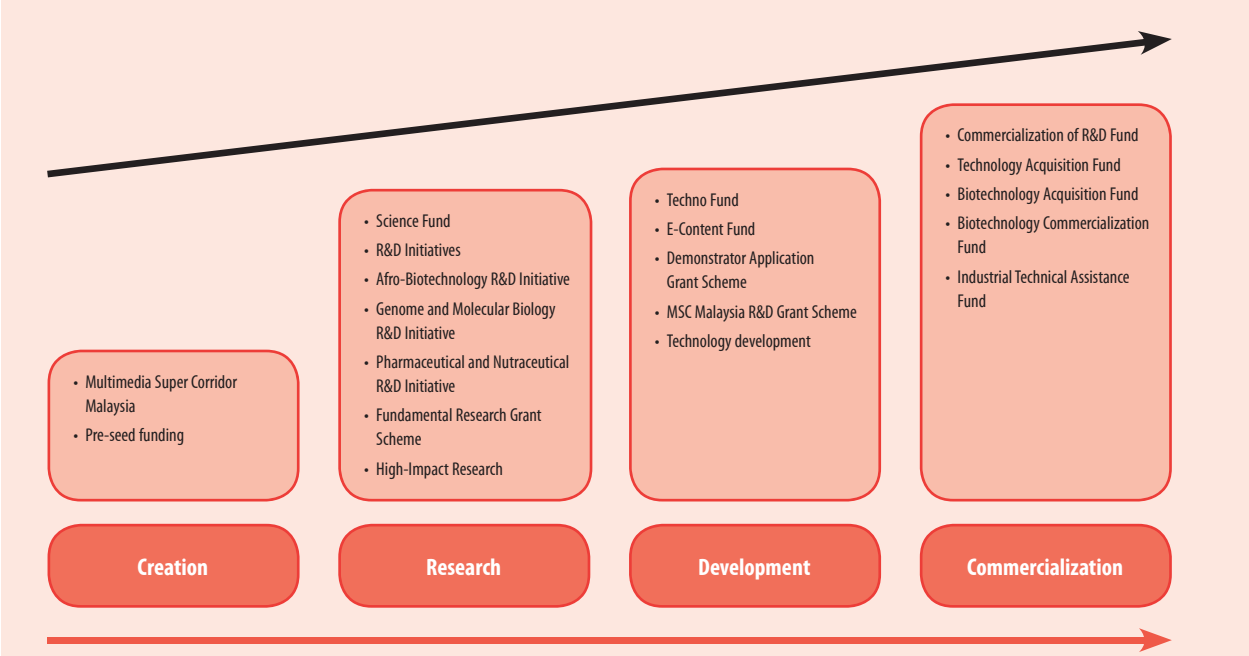
Government support of innovation in Malaysia occurs primarily through its science, technology, and innovation policies that began to be implemented in the 1980s. The types of programmes, focal areas, and target groups are shown in Figure 3; these are administered by the government directly and through the coordination of other public bodies. The Ministry of Science, Technology and Innovation (MOSTI) supports the creation, research, development, and commercialization of innovative activities in Malaysia. The number of projects approved by MOSTI and the amounts involved have increased since the government's first efforts, in 1991, to provide R&D grants following the introduction of the Action Plan for Industrial Technology Development to stimulate R&D in the country.[1]

Direct funding to stimulate research began in 1988 when the Intensification of Research in Priority Areas grant was launched under MOSTI. This grant was targeted towards public organizations such as universities and public research institutes. At the same time, the government introduced the double deduction tax incentive—a scheme offering tax exemption—for firms undertaking approved R&D. The Industrial R&D Grant Scheme to support R&D in the private sector was introduced in 1997 by MOSTI.

What has worked

Malaysia outperformed its middle-income peers in all seven pillars of the GII over the period 2011–14. Its general institutions for stimulating innovation are good, as can be seen from the improvements in its ranking in the ease of starting a business indicator, from 90th in 2012 to 15th in 2014. Malaysia's ranking in sub-pillar 1.3, Business environment, has also improved, seen in its rise from 53rd place in 2011 to 25th in 2014. At the same time, the government's increasing focus on research funding has helped stimulate expansion in innovation inputs and outputs, evidenced by the rise in R&D expenditure as a share of GDP, R&D researchers and scientists per

Figure 3: Public funding of innovation, Malaysia



Source: Adapted from Ministry of Science, Technology and Innovation, 2013.

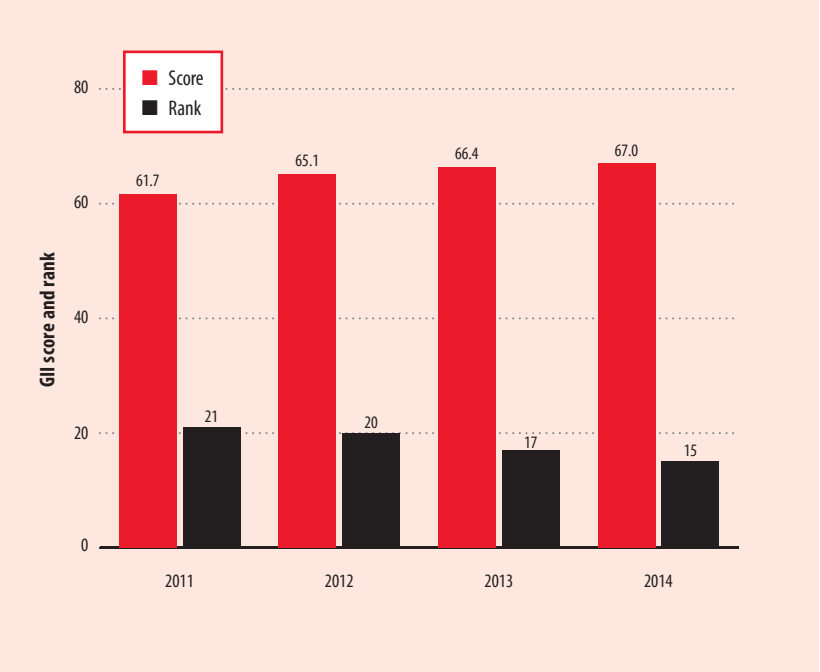
million persons, and number of doctoral graduates and scientific publications. Both the leadership at MOSTI and the National Science Research Council (NSRC) have systematically tried to address the need to target expenditure to the priority areas that can best generate innovation.

Since the promotion of export-oriented industrialization from 1971, high-tech production has become a major pillar of manufacturing in Malaysia.[2] Strong basic infrastructure and consistent promotion incentives that are well coordinated by the Malaysian Industrial Development Authority have ensured that foreign capital in Malaysia continues to assemble and test electronics products for the export market. Although the relative share of exports of high-tech products, such as integrated circuits, has fallen since the 1990s, high-tech exports have remained important. Malaysia not only ranked 2nd among all countries on high-tech exports in 2014, but the government's success in providing R&D grants to deserving firms since 2005 has successfully turned typically negative trade balances in the electronics components industry into a positive balance in 2013.[3] Although most electronics firms are still entrenched in assembly and test activities, the positive trade surplus was made possible largely through horizontal technological upgrading in assembly and testing, and vertical upgrading to wafer fabrication and chip design activities in Malaysia.[4]

Recognizing that private R&D cannot be a substitute for government funding—especially in cases where the benefits of R&D exhibit strong public goods characteristics—in 2010 the government boosted its R&D expenditure with a focus on increasing R&D scientists and engineers, commercialization, filing of intellectual property, scientific publications, and postgraduates, and began to emphasize innovation through substantially improved products and processes. Hence both R&D scientists and engineers per 10,000 workers and gross R&D expenditure in GDP rose from 15.6 and 0.5% in 2000 to 58.2 and 1.1%, respectively, in 2012.[5]

Through the coordination of MOSTI; the meso-organizations that address collective action problems, which include the Malaysia Industry-Government Group for High Technology (MIGHT), the Multimedia Development Corporation, the Malaysian Technology Development Corporation (MTDC), and the NSRC; and the country's five research universities: Universiti Malaya, Universiti Kebangsaan Malaysia, Universiti Sains Malaysia, Universiti Putra Malaysia, and Universiti Teknologi Malaysia, the government has managed to

Figure 4: University-industry collaboration in R&D: Score and rank, Malaysia, 2011–14



Source: GII, 2011–2014.

expand scientific input and output. Consequently, R&D scientists and engineers per 10,000 workers and gross expenditure in R&D (GERD) in GDP as a percentage have risen strongly; the share of R&D scientists and engineers per 10,000 workers also rose from 17.9 in 2006 to 58.2 in 2011, while GERD rose from 0.64 in 2006 to 1.13 in 2012.[6]

Since the 1990s, the government has strongly encouraged the starting of science and technology parks; it also launched MSC Malaysia (then known as the 'Multimedia Super Corridor') in 1996. Several grants, including the highly lucrative Techno-Fund, were launched to support this initiative. Since 2006, after a growing emphasis on performance (measured by the numbers of scientific publications and patents), these grants helped to raise the quantity of university-industry collaboration links and scientific publications. The provision of research grants to universities—which include some, such as the E-science fund, that encourage participation by industry—has helped raise university-industry collaboration in R&D activities in Malaysia. As shown in Figure 4, the university-industry collaboration in R&D score improved from 61.7 in 2011 to 67.0 in 2014. As a consequence, Malaysia's ranking in this indicator went up from 21st in 2011 to 15th in 2014.

Among the positive impacts of government support for funding research in universities through the Long Run Research Grant Scheme, the Fundamental Research Grant Scheme, the High Impact Research, and E-science grants is the sharp rise in scientific publications, though the numbers are still not comparable to those produced in the Republic of Korea or Taiwan, Province of China. Publications listed in the Thomson Reuters Web of Science index and the scopus databases of Malaysia's five public research universities rose sharply, from 1,391 and 2,228 in 2006 to 8,736 and 12,122, respectively, in 2014.[7] The total number of publications is not yet fully recorded in both databases, suggesting that the number of publications in the two databases may actually show a significant rise in 2014.

Business R&D has also performed well in Malaysia, both in terms of the commercialization of output and in the financing of it. An example of a successful business R&D programme is the R&D undertaken by members of the Malaysian Palm Oil Board (MPOB), which is financed from cess (taxes) collected from firms. Despite the saturation of land available for physical expansion, palm oil exports and the supply of palm oil products rose over the period 2000–14.[8] A major contributor to the sustainability of oil-based products is the new technologies and services emerging from R&D financed through MPOB's cess fund. The number of successful transfers of new technologies and services from such R&D varied between 21 and 59 over the period 2000–14.

What has not worked

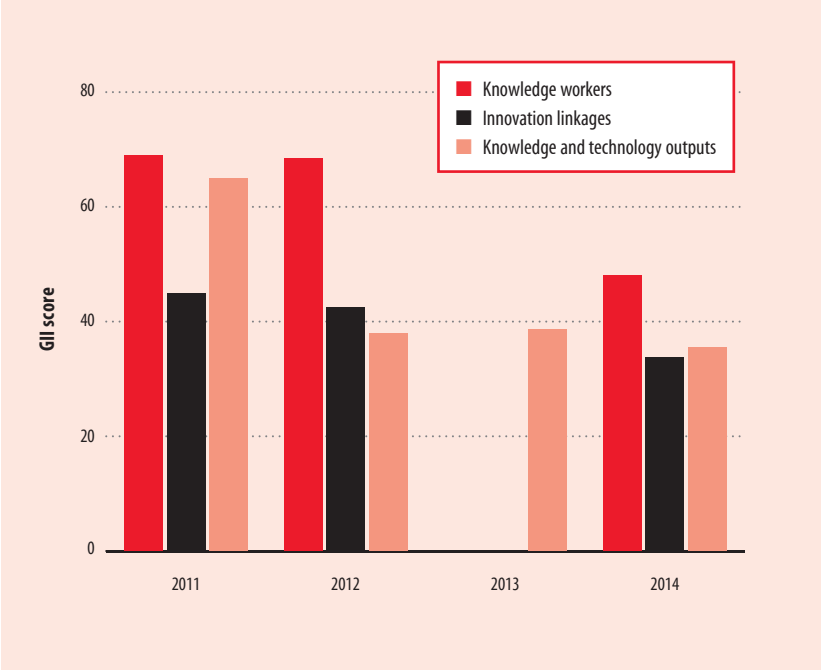
Despite being an innovation outperformer, some weaknesses still need to be addressed. Malaysia's performance in the efficiency of innovation has not kept pace with the significant improvements made in several pillars. Although Malaysia's Innovation Efficiency Ratio placed it 72nd in the 2014 GII (score 0.74), dropping from 52nd in 2013 (score 0.81), it was ranked 84th in 2012 (score 0.69) and 77th in 2011 (0.66). This relatively low performance can be attributed to its weak institutions, trade balance in royalties and licensing fees, and knowledge output.

Knowledge and technology outputs (pillar 6)

Innovation is strongly influenced by knowledge-based activities. Malaysia has not done well in this area: its ranking on knowledge-based workers, innovation linkages, and knowledge and technology outputs has fallen from 2011 to 2014. Indeed, the GII scores for Knowledge workers, Innovation linkages, and Knowledge technology and outputs for Malaysia fell from 69.0, 44.9, and 65.0, respectively, in 2011 to 48.1, 33.8, and 35.5, respectively, in 2014 (see Figure 5).

The government created the institutional setting for solving collective action problems by launching several initiatives: the Malaysian Technology Development Corporation, the Human Resource Development Council, MIGHT, the Multimedia Development Corporation, and the Multimedia Super Corridor. It also corporatized the Malaysian Institute of Microelectronics Systems in the 1990s to stimulate knowledge-based activities in the country, and increased grants to support R&D.[9] But much remains to be done to establish and strengthen links between these organizations and private firms, which may explain why Malaysia's strength in innovation linkages fell between 2011 and 2014.

Figure 5: Knowledge workers, Innovation linkages, and Knowledge and technology outputs scores: Malaysia, 2011–14



Source: GII, 2011–2014.

Business sophistication (pillar 5)

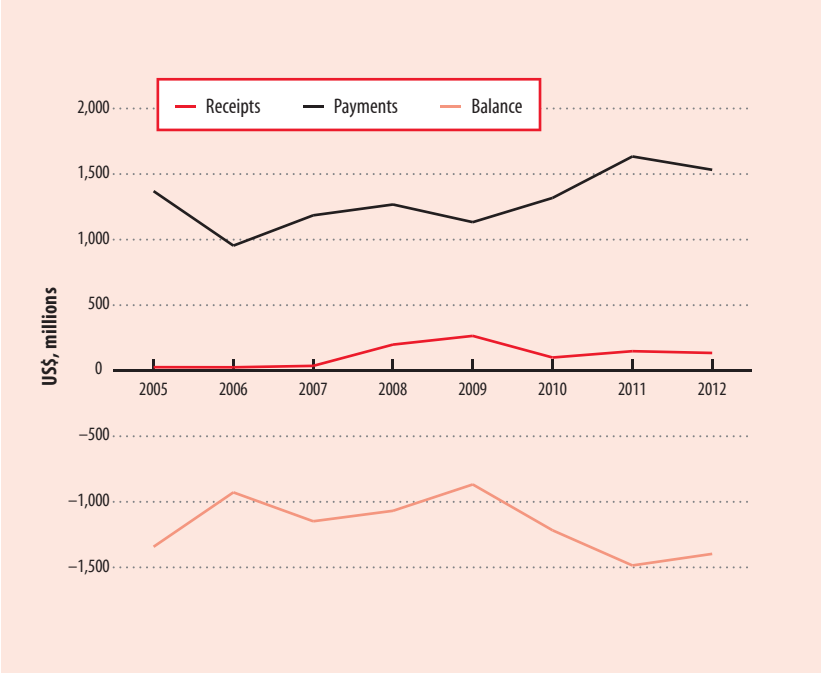
Trade balance in royalties and licensing fees is one indicator of innovation performance. Malaysia's score and ranking in this indicator has fallen over the period 2011–14 (its score fell from 57.5 to 19.6, and its rank fell from 11th to 47th).[10]

An intense assessment of receipts and payments shows that Malaysia has faced chronic deficits on trade in technology and service. Receipts enjoyed by Malaysia initially grew sharply from US$26.2 million in 2006 to US$265.7 million in 2009, but has since fallen in trend terms to US$135.4 million in 2012 (Figure 6). Payments made fell initially from US$1370 million in 2005 to US$954 million in 2006 before rising to US$1,634 million in 2011 and falling again slightly in 2012 to US$1,532. The much larger payments made against receipts received has continued to produce net deficit in receipts on the royalties and licensing account of trade. The net receipts improved in trend terms from negative US$1,343 million in 2005 to negative US$867 in 2009. However, net receipts increased in 2010, to negative US$1,485.

The chronic deficit in royalty and licensing fee receipts and payments demonstrates that Malaysia still relies strongly on foreign technology and services. Policies are needed to transform Malaysia from a technology-importing country to a technology-exporting one. In addition to aggressive marketing of national technologies, it will be important for strategies to stimulate the gradual substitution of imported technologies.

Although strong government funding has been accompanied by strong innovation output, such as in scientific publications and patents, it has not produced the same effect on the commercialization of these results. While the weak results are largely a consequence of weak university-industry linkages, it cannot be due to a lack of businesses capable of undertaking such activities, because businesses in Malaysia show strong internal funding and commercialization capabilities. Strong university-industry linkages exist in industrial training of undergraduates, but those linkages are not so obvious in R&D and in the placement of academics in firms. Hence, although the government

Figure 6: Royalty and licensing fees: Malaysia, 2005–12



Source: GII, 2011–2014.

has emphasized university-industry linkages in a number of grants distributed to universities, such as the E-science fund, much of the university research in the country is undertaken without much input from firms.

What Malaysia can learn from others

There is a need to enforce the university-industry matching grant framework that some economies—such as Taiwan, Province of China—successfully launched to ensure strong commercialization of GERD.[11] The Inno-fund in Malaysia partially deals with that framework but should be expanded to cover all grants advanced by the government.[12]

The case of Taiwan, Province of China, is a good example. The economy's Industrial Technology Research Institute (ITRI) has served as a key incubator that commercializes R&D and spins off indigenous technology-intensive firms, ever since the government identified catching up in the integrated circuit industry as a goal in the 1970s. Since then, the incubator continues to spin off firms in other important technology-related industries, aligning with the technology roadmaps of the government. Although still primarily specialized as original equipment manufacturers and original designing manufacturers, integrated circuit firms in this economy have caught up with world's frontier technologies by constantly absorbing and assimilating new external knowledge while developing their own.[13] In sub-industries, such as integrated circuits and machinery and equipment, firms in Taiwan, Province of China, are shaping the globe's technology frontier.[14]

Malaysia can also learn from the brain gain and brain circulation strategies of Taiwan, Province of China, because large numbers of Malaysia professionals are still living in Singapore, the United States of America, Australia, and the United Kingdom.[15] The economy's existing brain gain policies should be complemented by giving leadership positions in the key meso-organizations, such as MOSTI, the MTDC, and MIGHT, to Malaysians who are endowed with tacit and experiential knowledge. Such an effort will also allow Malaysian firms to leap across stages in the technology trajectory of products.

Future work

Although Malaysia has performed well as an innovating nation, much has to be done for it to move up the GII rankings in a number of innovation pillars. The most pressing are the Knowledge workers and Innovation linkages subpillars and the Knowledge and technology outputs pillar, as well as the net royalty and license fee receipts, as Malaysia's rank in these areas fell over the period 2011–14.

Knowledge and technology outputs (pillar 6)

The government can introduce a number of strategies to check the fall in ranking in knowledge-associated activities in Malaysia. The problem is not so much a consequence of falling enrolment in science and technology–based courses in schools and universities—Malaysia has done well using such measures. Instead the issue appears to be a relative decline in quality. A first step will be to investigate why the average performance of students in science and mathematics in the PISA assessment placed Malaysia 51st in 2014. The low performance is an indicator of the lack of quality that is essential for workers participation in knowledge-based activities.

Although university-industry linkages are relatively strong, Malaysia's progress towards a developed country will require greater numbers of information technology graduates, R&D scientists, and engineers; increased R&D expenditure; and improvements in university-industry linkages. Only then can Malaysia compete with the Republic of Korea and Taiwan, Province of China, in the commercialization of university research. Malaysia should use its excellent business environment, especially for starting new businesses, to strengthen innovation linkages between universities, science parks, and firms. Recently established in 2012, the Collaborative Research in Engineering, Science & Technology (CREST) is a key public-private initiative in Malaysia that has begun driving growth in the electrical-electronics industry. CREST focuses on bringing together the three key stakeholders (i.e., the industry, academia, and the government) in collaborative R&D, talent development, and commercialization. Because each research project granted by CREST conditions the participation of both universities and industrial firms, it is directly targeted at building university-industry linkages in the country (see Box 1).

Box 1: CREST as the bridge of university-industry linkages

The Collaborative Research in Engineering, Science & Technology (CREST) is the first research grant provider that targets only those R&D projects that drive university-industry linkages in Malaysia's electrical-electronics industry. By providing R&D grants, CREST promotes and facilitates academia and companies in collaborating in market-driven research. CREST does not operate research labs but focuses on funding research located either in universities or industry, as nominated by each research team.

CREST has received a good response from the industry players by focusing on projects that are relevant to and of values to market growth. Through close interactions with the industry players, CREST identifies the weak links in strategic segments and sets the direction of the types of R&D to be conducted. In addition, CREST promotes certain cluster programmes with the ultimate objective of driving local firms to gain higher-value-chain governance at the regional and international levels.

Since 2012, CREST has approved 74 projects through matching grants. Both universities and firms participate in every project. The projects involve a total fund of approximately US$16.5 million as of 2014, 65% of these funds were provided by companies. Eight projects were completed in 2014 and another 18 are expected to be completed in 2015. The remaining 48 projects are scheduled to be completed in 2016–18. CREST is aiming to gain 61 commercializable intellectual properties as of 2018, accompanied by 299 research publications, 89 Master's, and 32 Doctoral degree graduates.

Source

Author interview of the Chief Executive Officer of Crest, 2015.

Synergies between pillars: Linkages among Pillars 2, 5, and 6

Effort must be made to reduce the heavy reliance on technology and service imports in order to mitigate the chronic imbalance between royalties and licensing fees. Although it is typical to be a net importer of technology and services in the initial phase of economic growth, successful economies gradually overcome their dependence on these imports by developing domestic capabilities to overcome the deficits, thus eventually generating a positive trade balance in royalty receipts and licensing fees.

The Republic of Korea and Taiwan, Province of China, have both managed to achieve this transition over the period 1970–2000. Like these economies, Malaysia has relied heavily on foreign technology and services since 1970, but it has yet to evolve sufficient domestic capabilities to overcome the deficit, though national firms have managed to expand construction services abroad (e.g., highway construction).[16] Although considerable capabilities have evolved in resource-based industries—as in the oil palm industry, through the R&D and commercialization activities of the MPOB—similar efforts should be directed towards the high-tech industries of electric-electronics, automotive products, and biotechnology.

To ameliorate the above problems it will be imperative to maximize linkages between the networks linking firms to the universities, training centres, research institutes, and standards organizations. While connectivity is important, expanding the supply of knowledge workers is also critical because they are important participants in building innovation linkages. The expansion of innovation linkages will help increase knowledge and technology output.

Conclusions

Although export-oriented high-tech production has steered Malaysian's industrial expansion since the 1970s, its first few decades were dominated by low-value-added assembly and

test activities. Following the realization in the 1990s that science, technology, and innovation are crucial to sustaining rapid growth and structural change in the country, the government began directly and heavily financing R&D activities in universities, public laboratories, and industry. Important initiatives, funded through the pooling of cess, have been instrumental in stimulating the commercialization of R&D in businesses. The MPOB is a good example of such an initiative. Other successful schemes include the provision of grants to research universities, which has significantly stimulated expansion in scientific publications since 2006 and expanded innovation inputs and outputs.

The steering provided by the NSRC has been important, because this council has attempted to systematically address the different innovation pillars. It has called on the government to raise R&D funding and has periodically evaluated the performance of the meso-organizations, such as MIGHT, MTDC, and the Multimedia Development Corporation, which were launched to solve collection action problems, including those in public universities, associated with the production and delivery of knowledge output.

The main shortcomings preventing Malaysia from lifting its GII ranking above 33rd place relate to the efficiency of the innovation inputs and outputs. Both its scores and rankings in Knowledge workers, Innovation linkages, and Knowledge and technology output rankings have fallen between 2011 and 2014. As a consequence, Malaysia has remained a net technology and services importer, with net receipts and licensing fees remaining negative for many years. Greater efforts should be made to improve institutional support and knowledge-based activities to turn Malaysia into a net exporter of technology and services. Taiwan, Province of China, is a good model for Malaysia to consider in its efforts to strengthen innovation efficiency.

Malaysia's boosting of university-industry linkages, as reflected in the efforts of CREST, is a good example for other countries that want to improve their innovation capacity. By making it a requisite for universities to engage industry when seeking public R&D grants, scientific research at universities is increasingly targeted at commercialization.

Notes

1 Malaysia, 1995.

2 Rasiah, 2011.

3 WTO, 2014.

4 Rasiah et al., 2015b.

5 MASTIC, 2012; Ministry of Science, Technology and Innovation, 2013.

6 MASTIC, 2012; Ministry of Science, Technology and Innovation, 2013.

7 Information about the Web of Science index can be found at http://wokinfo.com/; information about the University Malaya database (2015) was accessed on 15 May 2015 from http://portal.um.edu.my/mt.php?f=perpustakaan&fn=Comparison-5RU-WOS-SCO-2006-2015-30Apr15-chart-asean.pdf.

8 MPOB, 2015.

9 Malaysia, 1995.

10 Indicator 5.3.1, royalties and license fees payments over total trade, changed in 2014 from being divided by total services imports to being divided by total trade.

11 Rasiah et al., 2010.

12 Ministry of Science, Technology and Innovation, 2013.

13 Rasiah et al., 2015b.

14 Tsai and Cheng, 2006.

15 Rasiah et al., 2015a.

16 Ministry of Science, Technology and Innovation, 2013.

References

Cornell University, INSEAD, and WIPO (World Intellectual Property Organization). 2013. *The Global Innovation Index 2013: The Local Dynamics of Innovation,* eds. S. Dutta and B. Lanvin. Geneva, Ithaca, and Fontainebleau: Cornell, INSEAD, and WIPO.

———. 2014. *The Global Innovation Index 2013: The Human Factor in Innovation,* eds. S. Dutta and B. Lanvin. Geneva, Ithaca, and Fontainebleau: Cornell, INSEAD, and WIPO.

INSEAD. 2011. *The Global Innovation Index 2011: Accelerating Growth and Development,* ed. S. Dutta. Fontainebleau: INSEAD.

INSEAD and WIPO (World Intellectual Property Organization). 2012. *The Global Innovation Index 2012: Stronger Innovation Linkages for Global Growth,* ed. S. Dutta. Fontainebleau: INSEAD and WIPO.

Malaysia, Economic Planning Unit. 1995. *Seventh Malaysia Plan 1996–2000.* Kuala Lumpur: Government Printers.

MASTIC (Malaysian Science and Technology Information Centre). 2012. *National Survey of Innovation.* Putrajayam Malaysia: MASTIC and Ministry of Science, Technology and Innovation. Available at http://www.mastic.gov.my/en/web/guest/national-innovation-survey.

Ministry of Science, Technology and Innovation (Malaysia). 2013. *Malaysia: Science Technology and Innovation Indicators Report 2013.* Putrajaya: Ministry of Science Technology and Innovation.

MPOB (Malaysian Palm Oil Board). No date. List of MPOB Technologies Transfer Projects, various years. Available at http://www.mpob.gov.my/en/technologies-for-commercialization/previous-technologies/, accessed 15 March 2015.

Rasiah, R., ed. 2011. *Malaysian Economy: Unfolding Growth and Social Change.* Shah Alam: Oxford University Press.

Rasiah, R., X. X. Kong, and Y. Lin. 2010. 'Innovation and Learning in the Integrated Circuits Industry in China and Taiwan'. *Journal of the Asia Pacific Economy* 15 (3): 226–47.

Rasiah, R., Y. Lin, and M. Anandakrishnan. 2015a. 'The Role of the Diaspora in Supporting Innovation Systems: The Experience of India, Malaysia and Taiwan.' In *Emerging Economies,* ed. P. Shome and P. Sharma. New Delhi: Springer. 353–73.

Rasiah R., X. S. Yap, and S. F. Yap. 2015b. 'Sticky Spots on Slippery Slopes: The Development of the Integrated Circuits Industry in Emerging East Asia'. *Institutions and Economies* 7(1): 52–79.

Tsai, T. and B. S. Cheng. 2006. *The Silicon Dragon: High Tech Industry in Taiwan.* Cheltenham: Edward Elgar.

WTO (World Trade Organization). 2014. *International Trade Statistics.* Geneva: World Trade Organization.

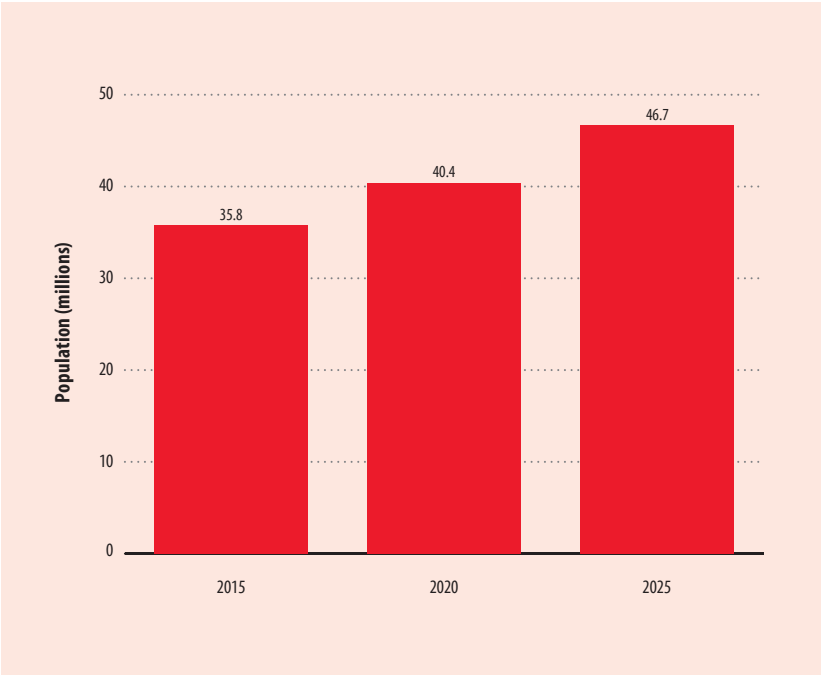
Effective Innovation Policies for Development: Uganda

Julius Ecuru, Uganda National Council for Science and Technology

Dick Kawooya, University of South Carolina, School of Library and Information Science

As a landlocked country, Uganda's economy is largely dependent on neighbouring countries for access to and participation in global economic activities. Until recently, following two decades of armed conflict that lasted from 1966 to 1986, Uganda relied on Kenya for the majority of its consumer goods. Since 1986 the country has focused its efforts on recovery, with socioeconomic activities and public policies geared towards development in key sectors such as roads, energy, agriculture, health, education, and security. Uganda's recent progress in the Global Innovation Index (GII) is the result of nearly 30 years of consistent and relatively predictable socioeconomic policies aimed at transforming the country from a peasant society to a middle-income economy by the year 2040.[1]

Figure 1: Projected population: Uganda, 2015–25



Source: Uganda Bureau of Statistics, 2014a.

The country has changed dramatically in both economic terms and other areas as a result of its relative political and economic stability. Demographic changes are the most notable. Between 1969 and 2014, Uganda's annual population growth rate was 2.88%—one of the highest in the world.[2] As shown in Figure 1, the 2014 census projects that the population will reach 46.7 million by the year 2025.[3] The population growth rate between 2015 and 2025 is expected to be 3.03%—again, one of the highest globally.[4] Although a healthy growing population is commendable, such demographic trends—where the population is becoming predominantly one of youths—place significant pressure on limited resources. Such a rapidly growing population requires simultaneously expanding the economy to accommodate the people's needs and adopting more sustainable practices in natural resource management. It is, therefore, absolutely critical for Uganda to turn to innovation and the creative use of resources across all sectors of the economy. So far Uganda's development strategies and policies have emphasized innovation through science and technology capacity development for various core sectors, including manufacturing and agro-processing, which are growing.[5] That growth partly explains Uganda's recent improvement in GII rankings.

This chapter presents a plausible explanation for Uganda's consistent improvement in the GII. The next section reviews Uganda's innovation ranking in the GII. Subsequent sections highlight what Uganda has done to score higher than other low-income countries, the innovation

policies that appear to have fostered innovation, and areas in policy that may need improvement. The chapter concludes with lessons to learn from Uganda's experience and that of other countries, and, finally, a proposal for policy mixes that would enable Uganda and similar countries improve in their innovation ranking.

Uganda's innovation ranking

In 2014, Uganda was classified as an 'innovation achiever' for the second time by the GII.[6] This means that Uganda's GII score relative to its GDP is significantly higher than that of other economies in its low-income bracket. Uganda was ranked 106th in 2011, 117th in 2012, 89th in 2013, and 91st in 2014, consistently outperforming a number of low-income countries. Although its GII performance might appear to be an outlier, long-term observers of the country's stable economic policies and performance will not find its GII scores surprising. For the period 1986–2010, the government's emphasis was on economic recovery; now it is on transforming Uganda into a middle-income society.[7] The government is currently focusing on deepening private-sector investment by improving its business environment and competitiveness through innovation. Uganda's GII strength in areas such as strong foreign direct investment net inflows is a direct result of the relative stability of the economy. Reform processes currently underway are aimed at addressing structural and institutional weaknesses that directly relate to Uganda's weak areas in the GII indicators, such as the ease of starting and the cost of doing business. However, as discussed below, the existing legal and policy framework is responsible for Uganda's positive innovation attributes.

Uganda's growth prospects

Uganda's economy is largely agro-based. The country's major exports are coffee, tea, cotton, and tobacco. Fish, assorted fruits, essential oils, vegetable, cereals, pulses, animal products, and minerals make up the pool of its non-traditional exports. Thus innovations in agro-processing and value addition may be essential for creating new sources of growth and agribusiness. Already Uganda is among a few African countries that are prioritizing investments in modern biosciences, especially in disease diagnostics, vaccine development, crop productivity improvement, and value-added agro-produce. Arguably, this type of investment puts Uganda on the path towards sustainable agricultural transformation. It also presents an opportunity to transition the majority of Ugandans from subsistence to commercial farming. Such effort could be an impetus for minimizing exports of raw materials and obtaining more revenue from trade in finished or semi-processed products.

Uganda's growth prospects look bright in both the medium and the long term. Uganda's recent positive innovation ranking is attributable to government efforts to increase and sustain higher rates of economic growth. Development experts project that economic growth rates of at least 7% per annum are needed if Uganda is to achieve middle-income status within the next two or three decades.[8] Its real GDP growth rate has so far averaged 5.3% per annum between 2001 and 2011. This growth in GDP has made positive gains in reducing poverty rates—these have fallen from 56% in 1992 to 31% in 2006, and they fell again, to 19.7%, in 2013.[9] These and other indicators are expected to improve even more as the country takes advantage of the crude oil discovered in 2006 in the Albertine Rift in western Uganda; production is expected to begin by end of this decade.[10]

Uganda's innovation policy reforms

Uganda's innovation policies can be traced through different sector policies, strategies, and pieces of legislation. Among these are the National Industrialization Policy 2008; the National Science, Technology and Innovation (STI) Policy 2009; the National Development Plan 2010; the Agricultural Sector Development Strategy and Plan; and several others. Although Uganda appears to have numerous policies relating to research and innovation, its challenge is to get a policy mix that is synergistic and creates an environment conducive to learning and interaction among actors in the public sector, private businesses, and civil society. Nonetheless, the emphasis on science and technology in today's government policies and strategies calls for more action from national organizations such as the Uganda National Council for Science and Technology as well as from local and regional innovation networks such as the Innovation Systems and Clusters Programme at Makerere University, Bio-Innovate, AfricaLics, and the Pan African Competitiveness Forum.

Policy discussions over the last decade have centred on institution building. These efforts have identified a need for a standalone ministry for science and technology, and have developed incentives such as a national innovation and industrialization fund to support the commercialization of new technologies.[11] Consequently, science and technology have been added to the Ministry of Education and Sports, creating a new Ministry of Education, Science, Technology,

and Sports. This ministry augments government's capacity development efforts in the science, technology, engineering, and mathematics (STEM) fields.[12] These institutional, structural, and human capacity elements of the innovation ecosystem have been emphasized in Uganda's Vision 2040. The challenge going forward will be to match the policy commitments to STEM promotion with financial resource allocations and to encourage the various actors to interact and learn from each other to spur innovation. Uganda's GII ranking may improve if the government sustains the momentum it has created—for example, through initiatives such as the National Innovation Fund (US$0.2 million) in the period 2003–04, the Presidential Support to Scientists (US$4 million) in the period 2006–14, and the Millennium Science Initiative Project (US$33.35 million) in the period 2007–13.

There is also a need to improve the management of intellectual property (IP). A number of IP laws have been updated in the last decade; updates include the Patents (Amendment) Act (2002), the Copyright and Neighbouring Rights Act (2006), the Trademarks Act (2010), the Plant Variety Protection Bill (2014), and the Industrial Property Law (2014). However, many scientists and innovators in Uganda are not aware of the existing IP laws. As a result, many simply do not take advantage of IP protection to leverage their competitive advantage. Furthermore, universities and other research organizations—with the exception of Makerere University, Uganda's largest public university—do not have internal policies that address and encourage research and IP management. Where such policies do exist, they are not used or implemented.[13] Probably more problematic is the inadequacy of the institutional framework for administering IP protections, especially in areas such as patents, which require highly trained and experienced experts in law and examination. Although the recent restructuring of the Uganda Registration Services Bureau (URSB) into a semi-autonomous agency will go a long way towards building administrative capacity, much remains to be done in terms of human capacity in the legal fraternity to support IP and knowledge-based businesses.

Innovation policy initiatives that appear to have worked

Successful initiatives fall into two general categories: those that enhance the competitiveness of firms and those that boost learning and competence. Both these areas are addressed below.

Enhancing the competitiveness of firms

Uganda promotes the private sector as the engine for economic growth and development, but the private sector must be competitive domestically and internationally. Efforts have been made to develop the private sector since Uganda's independence in 1962, but these have become more vigorous since the 1980s. The founding of the Private Sector Foundation for capacity and policy advocacy (1995), the Enterprise Uganda Foundation Limited for promoting entrepreneurship and business growth, the Uganda Investment Authority (1991) to create a favourable investment climate, and the Uganda Export Promotion Board to facilitate exports of Ugandan goods and services are probably some of the best known. Collectively, these entities have established a solid institutional foundation for developing Uganda's private sector. To this end, the policy focus has shifted to enhancing firm competitiveness.[14] Furthermore, since 2004, the annual Presidential Investors Round Table (PIRT)—which is chaired by the country's president—has become an influential forum in which industry can advocate for reforms in policy and service delivery that promote their business interests. As a result of the president's personal involvement, resolutions made at PIRT are often given priority in their implementation.

Innovation and competitiveness in service delivery within the public sector is also emphasized. The Civil Service College recognizes innovative public-service organizations. Bodies such as the Uganda Revenue Authority have deployed information and communication technologies in tax administration, making it increasingly easier for tax payers to comply with their tax obligations. Similarly, the Ministry of Finance has rolled out the Integrated Financial Management System, making it easier for public agencies to manage their financial resources. As previously noted, reforms taking place within the URSB have improved IP administration and management as well as business registration services. Implementing the URSB's Strategic Investment Plan for 2012–17 may remove institutional bottlenecks involved in business registration, which in turn would improve Uganda's current low score on the ease of starting and cost of running businesses.

Learning and competence building

Higher education in Uganda has dramatically grown in the last decade. Uganda has 189 tertiary institutions, of which 72% (115) are privately owned.[15] As shown in Table 1, enrolment is primarily in universities, leaving little room for other institutes such as technical colleges, which traditionally play

Table 1: Enrolment in Ugandan institutions 2011–12

Institution type	Number of Institutions	Enrolment, male	Enrolment, female	Total	Percentage of total institutions
Universities	32	78,817	61,270	140,087	71.3
Business institutes	58	12,260	12,724	24,984	12.7
National teachers colleges	7	4,989	2,853	7,842	4.0
Health care institutes	21	3,924	3,564	7,488	3.8
Management institutes	12	2,293	3,179	5,472	2.8
Technical colleges	5	2,914	336	3,250	1.7
Agriculture, fisheries, and forestry institutes	3	1,169	456	1,625	0.8
Media institutes	4	967	653	1,620	0.8
Theology colleges	11	1,326	271	1,597	0.8
Law institutes	1	500	300	800	0.4
Cooperative colleges	2	204	144	348	0.2
Tourism institutes	3	137	89	226	0.1
Art institutes	1	134	61	195	0.1
Aviation institutes	1	127	20	147	0.1
Meteorological institutes	1	15	24	39	0.0
Survey institutes	1	27	3	30	0.0
Others	2	452	188	640	0.3
Total	**165**	**110,255**	**86,135**	**196,390**	**100.0**

Source: National Council for Higher Education, cited in Uganda Bureau of Statistics, 2014b, p. 18.

critical roles in STI training. Public universities, which constitute 28% of tertiary institutions, are mainly science and technology-oriented. However, enrolment in STEM programmes is still under 25% for all universities, a rate that is captured by the GII as a weakness. Teaching is the main focus of most universities in Uganda, although research capacity is growing in a number of public universities, especially Makerere University. Furthermore, the co-location of public universities in the various regions of the country, and an emphasis on STEM education, may in the long term have a positive influence on the local innovative activities of surrounding firms and communities.

At the same time, entrepreneurial activities are gaining prominence within university systems, especially Makerere University. These show an increasing recognition of the value of university-industry-government links. At Makerere University, for example, the Innovation Systems and Clusters Programme, which started in 2003–04 with initial support from the Swedish International Development Cooperation Agency (Sida), has established and is working with more than 50 innovative clusters in different sectors of trade. Cluster formation is encouraged by the industrial policy of Uganda of 2008. Another example is Makerere University's efforts to build competence in innovation and development through a Master of Science Programme in Technology Innovation and Industrial Development (TIID) at its College of Engineering, Design, Art and Technology. Although the programme is still quite new (it was established in 2012), it builds on many years of collaboration between Makerere University and the Norwegian University of Science and Technology. TIID will be instrumental in locally training the next generation of STI experts. TIID draws from and is deeply rooted in activities of key partners such as the Uganda Institution of Professional Engineers, the Uganda Association of Architects, the Uganda National Association of Building and Civil Engineering Contractors, the Uganda Manufacturers Association, and the Uganda Small Scale Industries Association.[16] These initiatives, among others, may go some way towards explaining Uganda's GII strength with respect to innovation linkages and research and development financing from abroad.

One important dimension of innovation in Uganda is its learning by doing aspect, especially in the informal sector, which constitutes about two-thirds of the country's businesses.[17] Because the majority of agricultural activities are informal in nature and 72% of the labour force is engaged in agriculture, the informal

Box 1: Formal and informal sector collaboration: The Kiira EV

One of the major breakthroughs that resulted from the Presidential Support to Scientists is East and Central Africa's first electric vehicle, called the 'Kiira EV'.[1] The Kiira EV is a prototype electric car designed and produced in Uganda by engineering students and faculty researchers at Makerere University's College of Engineering, Design, Art and Technology through the Centre for Research in Transportation Technologies (CRTT). Although the Kiira EV is an important technological breakthrough for Ugandan researchers, the involvement and integration of the informal-sector artisans in its production is an even more important aspect of the innovation process. The Kiira EV project was designed by CRTT researchers and students, and informal-sector artisans were heavily involved in the fabrication of its components and in translating theoretical designs into practical solutions. Informal-sector artisans who worked on the project were required to sign non-disclosure agreements, which would help to protect Makerere University's trade secrets. The Kiira EV is expected to go into production in 2018 with a unique labour model that integrates informal-sector workers into the manufacturing of the cars. This distinctive model of vertical integration between formal and informal sectors exemplified in the Kiira EV project is critical to transforming African labour markets and economic activities that are predominantly informal in nature.

Note

1 Kawooya, 2014.

economy contributes significantly to the country's GDP.[18] To foster productivity in the informal sector, efforts have been made—particularly by non-governmental organizations such as the Gatsby Trust, SNV, the Belgian Development Agency (BTC), Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), and Swisscontact, among others—to improve the skills of youth and women so they can either start or improve their businesses. Although these efforts have so far focused on poverty alleviation, job creation, or income enhancement, attention should be paid to the competitiveness of the informal sector. Complementary initiatives by the Uganda government and development partners have concentrated on improving business, technical, and vocational skills through the Skilling Uganda Project. This programme was launched in 2012 with the goal of meeting the skills needs of small and medium-sized enterprises.

Innovation promotion

Innovation promotion by the government, especially by inspiring young people to be creative and demonstrating this support at the highest political office, the presidency, builds a culture of innovation that pays off in the long term. The president's support has been evident through funding creative programmes at Makerere University, such as the electric Kiira EV motor vehicle (Box 1), and through developing value-added products by the Colleges of Agriculture and Environment and of Veterinary Medicine. Prototypes have been developed, some patented, through the president's initiative, part of which is also implemented through the Uganda National Council for Science and Technology. Scaling up these prototypes into commercial products remains a challenge, however. Although access to credit has improved dramatically, as shown in Uganda's GII data, the ease of starting businesses based on new home-grown technologies remains challenging. On the other hand, anecdotal evidence shows that the president's emphasis on wealth creation within communities is inspiring creativity and innovative thinking among youth, especially in agro-processing and agribusiness. Such creativity has often drawn the attention of the media, which have featured successful entrepreneurs and products. Examples of such media attention include 'Seeds of Gold', a feature article published every Wednesday in the *Daily Monitor* newspaper,[19] and 'Pakasa', a feature story published in every Friday edition of *New Vision Newspaper*.[20]

What Uganda's innovation policy should emphasize

Uganda is making progress with respect to building innovation capabilities in both the public and private sector. However, a policy mix that promotes innovation and creativity in universities and firms is needed. The rapid growth of universities is an opportunity to harness young talent by supporting creative work, research, and innovation. Streamlining the financing policy for research and innovation is a vital next step. Public universities and research organizations receive direct funding from government, but less than 2% of funds received is

allocated to research and innovation activities. This direct funding, albeit small, should be supplemented with competitive grants that are made available annually. Competitive grants for research and innovation attracts good talent and encourages creativity in research organizations and universities. This model of financing research and innovation ensures accountability for results and resources, and it is usually the bedrock upon which international research funding and collaborations are built. Creating new businesses through active business incubation should also be pursued. Some work in this regard is being done at Makerere University and the Uganda Industrial Research Institute, but it is centred more on technology development and incubation than on business incubation. Capacity development for business incubation is desirable and can be matched with support offered to innovative cluster initiatives, where universities play enhanced roles in knowledge brokerage for business.

Regionally, collaboration among universities and research organizations within the East Africa Community appears to be growing. Regional networks such as Bio-Innovate, which support bioscience innovations across the region, have made remarkable progress in capacity building for bio-based innovations. This, along with other regional initiatives such as the Biosciences eastern and central Africa Hub – International Livestock Research Institute,[21] catalyse and support innovation processes at national and regional level. Another example is the newly established East Africa Commission for Science and Technology in Kigali Rwanda, which also emerges as a regional platform for collaboration in science and technology.[22]

Lessons to be learned

The key lesson for countries low in the GII rankings, especially those in the low-income bracket, is that policy formulation and institutional capacity development around STI must be addressed concurrently.

Innovation-driven economies owe their success in part to strong political leadership in STI policy and implementation. The recent creation of a Ministry of Education, Science, Technology and Sports (in March 2015), with respect to science and technology governance, puts Uganda on par with Kenya, Tanzania, Ethiopia, South Africa, and the Republic of Korea, to mention a few countries. Having a standalone ministry for science and technology is good but not necessarily sufficient as a driver for innovation, however. The new institutional arrangement, which creates a new docket for science and technology, should interact and work synergistically with the other actors—particularly the Finance Ministry and the Trade and Industry Ministry. Such co-working would mimic scenarios in innovation-driven economies, which have their trade and industry ministries tightly connected within their national systems of innovation, and which play enhanced roles in bridging the gap between research and innovation centres and industry. This also requires support for active business incubation programmes closely linked to higher education institutes.

Conclusions

Uganda can maintain its lead and do progressively better in its innovation ranking. The GII rankings for the period 2011–14 consistently show Uganda outperforming other low-income countries at the same level of development. As shown in this chapter, Uganda's innovation performance is closely linked to the wider mix of socioeconomic policies, which over the years have remained stable and predictable. The policy mix has enabled both the attraction of foreign direct investment and the advance of other conditions favourable to learning and innovation. That notwithstanding, much remains to be done. The cost and ease of doing business remain unacceptably high compared with that of other low-income countries. Also needed are sustained support and government commitment to research and innovation activities in universities, research institutes, and other centres through direct as well as annual competitive grants.

Uganda has made great strides towards improved innovation capacity. Its promise is that the country is positioned to make even more progress in the near and medium term.

Notes

1 Government of Uganda, 2013.

2 UBOS, 2014a.

3 UBOS, 2014a.

4 UBOS, 2014a.

5 UBOS, 2014b.

6 Countries in this classification were previously termed 'innovation learners'.

7 MFPED, 2010.

8 MFPED, 2010.

9 MFPED, 2014.

10 Silvia, 2014.

11 Ecuru et al., 2012.

12 MoES, 2013.

13 Kabi et al., 2013.

14 MFPED, 2012.

15 MoES, 2013.

16 For details about the Master of Science in Technology Innovation and Industrial Development Programme, see http://cedat.mak.ac.ug/graduate-programmes/master-of-science-in-technology-innovation-and-industrial-development.

17 Kawooya, 2014.

18 UBOS, 2014b.

19 For example, on 25 March 2015 the 'Seeds of Gold' featured a journalist who ventured into passion fruit farming (Afedraru, 2015); The *Daily Monitor* newspaper is available at www.monitor.co.ug.

20 For example, on 20 March 2015 the 'Pakasa' story featured a businesswoman who ventured into trade in South Sudan (Kanaabi, 2015); the *New Vision Newspaper* is available at www.newvision.co.ug.

21 For details about this hub, see http://hub.africabiosciences.org/.

22 Bahati, 2014.

References

Afedraru, L. 2015. 'From Journalist to Passion Fruit Grower'. *The Daily Monitor,* 25 March. Available at http://www.monitor.co.ug/Magazines/Farming/From-journalist-to-passion-fruit-grower/-/689860/2664262/-/v2ejpr/-/index.html.

Bahati, P. M. 2014. 'East Africa: Rwanda to Host EAC Science and Technology Commission'. *allAfrica,* 25 February. Available at http://allafrica.com/stories/201402261514.html.

Ecuru, J., L. Trojer, Y. N. Ziraba, and P. O. Lating. 2012. 'Structure and Dynamics of Uganda's Technological Innovation System'. *African Journal of Science, Technology, Innovation and Development* 4 (4): 255–74.

Government of Uganda. 2013. *Uganda Vision 2040.* Kampala: Government of Uganda.

Kabi, F., F. B. Bareeba, M. Kwizera, P. Walekhwa, V. D. S. R. Prasad, D. V. N. Raju, J. Rubaramira, and A. Ssekitoleko. 2013. 'Public-Private Partnerships for Unlocking the Potential of Dairy Cattle Productivity in Uganda for Improved Livelihoods'. *Livestock Research for Rural Development* 25 (6). Available at http://www.lrrd.org/lrrd25/6/kabi25109.htm.

Kanaabi, M. 2015. 'I lost Sh. 3.8b of my Capital in South Sudan'. *The New Vision,* 20 March.

Kawooya, D. 2014. 'Informal-Formal Sector Interactions in Automotive Engineering, Kampala'. In *Innovation & Intellectual Property - Collaborative Dynamics in Africa,* eds. J. de Beer, C. Armstrong, C. Oguamanam, and S. Tobias, Cape Town: UCT Press in association with the IP Unit, Faculty of Law, University of Cape Town (UCT) and Deutsche Gesellschaft für Internationale Zusammenarbeit.

MoES (Ministry of Education and Sports, Uganda). 2013. *Ministerial Policy Statement 2012/13.* Kampala. Available at http://www.education.go.ug/files/downloads/MPS FY 2012-13.pdf.

MFPED (Ministry of Finance Planning and Economic Development, Uganda). 2010. *National Development Plan 2010/11-2014/15: Development.* Kampala: Government of Uganda.

MFPED (Ministry of Finance Planning and Economic Development, Uganda). 2012. *Competitiveness and Investment Climate Strategy: Progress Report on the Implementation of the Doing Business in Uganda reform memo, 2009.* Kampala: Government of Uganda.

MFPED (Ministry of Finance Planning and Economic Development, Uganda). 2014. *Poverty Status Report 2014.* Kampala: Government of Uganda.

Silvia, A. 2014. 'Bulk of Uganda Commercial Oil Production to Start in 2017'. *Reuters,* 9 May. Available at http://www.reuters.com/article/2014/05/09/uganda-oil-idUSL6N0NV4AW20140509.

UBOS (Uganda Bureau of Statistics). 2014a. *2014 Census Population.* Kampala: Government of Uganda.

UBOS (Uganda Bureau of Statistics). 2014b. *Statistical Abstract 2014.* Kampala: Government of Uganda.

Appendices

Appendix I

Country/Economy Profiles

Country/Economy Profiles

The following tables provide detailed profiles for each of the 141 economies in the Global Innovation Index (GII) 2015. They are constructed around four sections.

1 Five key indicators at the beginning of each profile are intended to put the economy into context. They present the population in millions,[1] GDP in US$ billions, and GDP per capita in PPP current international dollars.[2] The fourth indicator categorizes the economy into income group and the fifth indicates its geographical region.[3]

2 The next section provides the economy's scores and rankings on the GII, the Innovation Output Sub-Index, the Innovation Input Sub-Index, and the Innovation Efficiency Ratio.

The GII ranking for the 2014 edition comes next. Because two economies dropped out in 2015, and because of adjustments made to the GII framework every year and other technical factors not directly related to actual performance (missing data, updates of data, etc.), the GII rankings are not directly comparable from one year to the next. Please refer to Annex 2 of Chapter 1 for details.

Scores are normalized in the 0–100 range except for the Innovation Efficiency Ratio, for which scores revolve around the number 1 (this index is calculated as the ratio between the Output and Input Sub-Indices).

The Innovation Input Sub-Index score is calculated as the simple average of the scores in the first five pillars, while the Innovation Output Sub-Index is calculated as the simple average of the scores in the last two pillars.

3 Pillars are identified by single-digit numbers, sub-pillars by two-digit numbers, and indicators by three-digit numbers. For example, *indicator 1.3.1, ease of starting a business,* appears under *sub-pillar 1.3, Business environment,* which in turn appears under *pillar 1, Institutions.*

The 2015 GII includes 79 indicators and three types of data. Composite indicators are identified with an asterisk (*), survey questions from the World Economic Forum's Executive Opinion Survey are identified with a dagger (†), and the remaining indicators are all hard data series.

For hard data, the original value is provided (except for indicators 7.3.1, 7.3.2, and 7.3.4, for which the raw data were provided under the condition that only the normalized scores be published). Normalized scores in the 0–100 range are provided for everything else (index and survey data, sub-pillars, pillars, and indices).

When data are either not available or out of date (the cut-off year is 2004), 'n/a' is used. To the right of the indicator title, a clock symbol indicates that the country's data for that indicator are older than the base year. More details, including the year of the data in question, are available in Appendix II.

For further details, see Appendix III, Sources and Definitions, and Appendix IV, Technical Notes.

4 To the far right of each column, a solid circle indicates that an indicator is one of the strengths of the country/economy in question, and a hollow circle indicates that it is a weakness.

All top ranks (of 1) are highlighted as strengths; for the remaining indicators, strengths and weaknesses of a particular economy are based on the percentage of economies with scores that fall below its score (i.e., percent ranks).

- For a given economy, strengths (●) are those scores with percent ranks greater than the 10th largest percent rank among the 79 indicators in that economy.
- Similarly, for that economy, weaknesses (○) are those scores with percent ranks lower than the 10th smallest percent rank among the 79 indicators in that economy.

Percent ranks embed more information than ranks and allow for comparisons of ranks of series with missing data and ties in ranks. Examples from Ireland illustrate this point:

1. Strengths for Ireland are all indicators with percent ranks above 0.96 (10th largest percent rank for Ireland); weaknesses are all indicators with percent ranks below 0.60 (Ireland's 10th smallest percent rank).
2. Ireland ranks 6th out of 141 economies in 4.2.1, *ease of protecting investors,* with a percent rank of 0.96; this indicator is a strength for Ireland.
3. Ireland also ranks 6th in 5.2.4, *JV-strategic alliance deals/tr PPP$ GDP,* but with a percent rank of 0.94 (because only 94 countries are covered by that indicator), this indicator is not a strength for Ireland.
4. The rank of 58 (percent rank of 0.57) in 4.3.2, *intensity of local competition,* is a weakness for Ireland. By contrast, the rank of 96 for Myanmar for that same indicator is a strength for Myanmar (with a percent rank of 0.28, this is above the cutoff for strengths for Myanmar, which is 0.24).

Percent ranks are not reported in the Country/Economy Profiles but they are presented in the Data Tables (Appendix II).

Notes

1 Data are from the United Nations, Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2012 Revision*.

2 Data for GDP and GDP per capita are from the International Monetary Fund *World Economic Outlook 2014* database.

3 Income group is according to the World Bank Income Group Classification (July 2013): LI = low income; LM = lower-middle income; UM = upper-middle income; and HI = high income. Geographical regions are based on the United Nations Classification: EUR = Europe; NAC = Northern America; LCN = Latin America and the Caribbean; CSA = Central and Southern Asia; SEAO = South East Asia and Oceania; NAWA = Northern Africa and Western Asia; and SSF = Sub-Saharan Africa.

Index of Country/Economy Profiles

Albania

Key indicators

Population (millions)	3.2
GDP (US$ billions)	13.3
GDP per capita, PPP$	9,903.5
Income group	Upper-middle income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**30.7**	**87**	
Innovation Output Sub-Index		20.3	112	
Innovation Input Sub-Index		41.2	73	
Innovation Efficiency Ratio		0.5	129	○
Global Innovation Index 2014 (out of 143)		30.5	94	
1	**Institutions**	**60.1**	**70**	
1.1	Political environment	49.0	72	
1.1.1	Political stability*	65.6	62	
1.1.2	Government effectiveness*	32.4	87	
1.2	Regulatory environment	58.5	91	
1.2.1	Regulatory quality*	52.5	65	
1.2.2	Rule of law*	32.4	95	
1.2.3	Cost of redundancy dismissal, salary weeks	20.8	96	
1.3	Business environment	72.7	56	
1.3.1	Ease of starting a business*	91.9	36	●
1.3.2	Ease of resolving insolvency*	61.4	42	●
1.3.3	Ease of paying taxes*	64.8	102	
2	**Human capital & research**	**21.8**	**101**	
2.1	Education	38.0	91	
2.1.1	Expenditure on education, % GDP◴	3.3	105	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	n/a	n/a	
2.1.4	PISA scales in reading, maths, & science	395.2	57	○
2.1.5	Pupil-teacher ratio, secondary	14.8	63	
2.2	Tertiary education	25.7	85	
2.2.1	Tertiary enrolment, % gross	55.5	47	
2.2.2	Graduates in science & engineering, %◴	13.8	88	
2.2.3	Tertiary inbound mobility, %	1.3	78	
2.3	Research & development (R&D)	1.7	108	
2.3.1	Researchers, FTE/mn pop.◴	147.9	79	
2.3.2	Gross expenditure on R&D, % GDP◴	0.2	99	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**39.0**	**71**	
3.1	Information & communication technologies (ICTs)	44.2	74	
3.1.1	ICT access*	46.2	84	
3.1.2	ICT use*	32.6	63	
3.1.3	Government's online service*	44.9	72	
3.1.4	E-participation*	52.9	59	
3.2	General infrastructure	26.8	88	
3.2.1	Electricity output, kWh/cap	1,495.3	86	
3.2.2	Logistics performance*	n/a	n/a	
3.2.3	Gross capital formation, % GDP	24.9	45	
3.3	Ecological sustainability	46.0	40	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	12.3	10	●
3.3.2	Environmental performance*	54.7	61	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.1	63	
4	**Market sophistication**	**59.1**	**24**	●
4.1	Credit	35.8	53	
4.1.1	Ease of getting credit*	65.0	34	
4.1.2	Domestic credit to private sector, % GDP	37.6	88	
4.1.3	Microfinance gross loans, % GDP	2.6	22	●
4.2	Investment	72.5	3	
4.2.1	Ease of protecting investors*	72.5	7	●
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	68.9	99	
4.3.1	Applied tariff rate, weighted mean, %	1.1	36	●
4.3.2	Intensity of local competition†	41.5	131	○
5	**Business sophistication**	**26.2**	**118**	
5.1	Knowledge workers	22.9	113	
5.1.1	Knowledge-intensive employment, %◴	16.1	89	
5.1.2	Firms offering formal training, % firms	23.8	80	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %◴	3.3	79	
5.1.5	Females employed w/advanced degrees, % total	9.0	66	
5.2	Innovation linkages	19.7	126	○
5.2.1	University/industry research collaboration†	22.3	128	○
5.2.2	State of cluster development†	33.4	120	○
5.2.3	GERD financed by abroad, %◴	7.4	54	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.1	50	
5.3	Knowledge absorption	36.0	58	
5.3.1	Royalty & license fees payments, % total trade	0.4	63	
5.3.2	High-tech imports less re-imports, % total trade	3.6	116	○
5.3.3	Comm., computer & info. services imp., % total trade	1.6	36	●
5.3.4	FDI net inflows, % GDP	11.5	10	●
6	**Knowledge & technology outputs**	**18.5**	**110**	
6.1	Knowledge creation	2.9	126	
6.1.1	Domestic resident patent app./bn PPP$ GDP◴	0.1	99	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	86	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	5.3	96	
6.1.5	Citable documents H index	40.0	127	○
6.2	Knowledge impact	26.0	117	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.7	82	
6.2.2	New businesses/th pop. 15–64	0.9	74	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	5.5	58	
6.2.5	High- & medium-high-tech manufactures, %	1.0	99	○
6.3	Knowledge diffusion	26.7	74	
6.3.1	Royalty & license fees receipts, % total trade	0.0	86	
6.3.2	High-tech exports less re-exports, % total trade	0.2	94	
6.3.3	Comm., computer & info. services exp., % total trade	3.4	16	●
6.3.4	FDI net outflows, % GDP	0.2	81	
7	**Creative outputs**	**22.0**	**114**	
7.1	Intangible assets	29.6	129	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	49.9	52	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.2	50	
7.1.3	ICTs & business model creation†	40.1	119	○
7.1.4	ICTs & organizational model creation†	34.2	126	○
7.2	Creative goods & services	19.5	69	
7.2.1	Cultural & creative services exports, % total trade	0.8	18	●
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.1	84	
7.3	Online creativity	9.2	81	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	6.8	53	
7.3.2	Country-code TLDs/th pop. 15–69	1.7	76	
7.3.3	Wikipedia edits/pop. 15–69	2,576.7	47	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Algeria

Key indicators

Population (millions)	39.9
GDP (US$ billions)	214.1
GDP per capita, PPP$	7,815.9
Income group	Upper-middle income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**24.4**	**126**	
Innovation Output Sub-Index		16.7	129	
Innovation Input Sub-Index		32.1	119	
Innovation Efficiency Ratio		0.5	125	
Global Innovation Index 2014 (out of 143)		24.2	133	
1	**Institutions**	**45.1**	**120**	
1.1	Political environment	30.2	120	
1.1.1	Political stability*	35.2	123	
1.1.2	Government effectiveness*	25.1	106	
1.2	Regulatory environment	52.2	108	
1.2.1	Regulatory quality*	16.2	135	
1.2.2	Rule of law*	29.5	105	
1.2.3	Cost of redundancy dismissal, salary weeks	17.3	78	●
1.3	Business environment	52.8	127	
1.3.1	Ease of starting a business*	74.1	114	
1.3.2	Ease of resolving insolvency*	42.7	91	
1.3.3	Ease of paying taxes*	41.6	133	
2	**Human capital & research**	**26.2**	**82**	●
2.1	Education	45.4	67	
2.1.1	Expenditure on education, % GDP◴	4.3	77	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years◴	14.0	58	●
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	32.2	69	●
2.2.1	Tertiary enrolment, % gross	31.5	75	●
2.2.2	Graduates in science & engineering, %◴	25.0	26	●
2.2.3	Tertiary inbound mobility, %◴	0.5	91	
2.3	Research & development (R&D)	1.1	115	
2.3.1	Researchers, FTE/mn pop.◴	164.7	71	
2.3.2	Gross expenditure on R&D, % GDP◴	0.1	112	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**31.4**	**95**	
3.1	Information & communication technologies (ICTs)	16.9	128	
3.1.1	ICT access*	44.6	93	
3.1.2	ICT use*	7.3	115	
3.1.3	Government's online service*	7.9	136	○
3.1.4	E-participation*	7.8	137	○
3.2	General infrastructure	40.1	38	●
3.2.1	Electricity output, kWh/cap	1,491.6	87	
3.2.2	Logistics performance*	24.9	91	
3.2.3	Gross capital formation, % GDP	37.7	9	●
3.3	Ecological sustainability	37.3	72	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.4	33	●
3.3.2	Environmental performance*	50.1	82	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	115	
4	**Market sophistication**	**36.8**	**124**	
4.1	Credit	7.0	135	
4.1.1	Ease of getting credit*	10.0	133	○
4.1.2	Domestic credit to private sector, % GDP	16.7	123	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	45.0	41	
4.2.1	Ease of protecting investors*	45.0	114	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	58.3	131	
4.3.1	Applied tariff rate, weighted mean, %◴	8.6	113	
4.3.2	Intensity of local competition†	46.7	129	○
5	**Business sophistication**	**20.9**	**135**	
5.1	Knowledge workers	21.5	118	
5.1.1	Knowledge-intensive employment, %	17.6	82	
5.1.2	Firms offering formal training, % firms◴	17.3	95	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total◴	4.4	77	
5.2	Innovation linkages	20.0	125	
5.2.1	University/industry research collaboration†	21.1	129	○
5.2.2	State of cluster development†	38.6	102	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	87	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	103	
5.3	Knowledge absorption	21.4	132	
5.3.1	Royalty & license fees payments, % total trade◴	0.2	85	
5.3.2	High-tech imports less re-imports, % total trade	7.3	61	●
5.3.3	Comm., computer & info. services imp., % total trade◴	0.2	118	
5.3.4	FDI net inflows, % GDP	0.8	118	
6	**Knowledge & technology outputs**	**17.8**	**115**	
6.1	Knowledge creation	4.0	113	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.2	88	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	95	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	4.2	107	
6.1.5	Citable documents H index	89.0	81	●
6.2	Knowledge impact	34.4	87	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.6	57	●
6.2.2	New businesses/th pop. 15–64	0.5	85	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.0	114	
6.2.5	High- & medium-high-tech manufactures, %◴	29.1	38	●
6.3	Knowledge diffusion	14.9	128	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	97	
6.3.2	High-tech exports less re-exports, % total trade	0.0	126	○
6.3.3	Comm., computer & info. services exp., % total trade◴	0.4	103	
6.3.4	FDI net outflows, % GDP	(0.1)	113	
7	**Creative outputs**	**15.6**	**131**	
7.1	Intangible assets	20.6	135	○
7.1.1	Domestic res trademark app./bn PPP$ GDP◴	6.9	99	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP◴	0.0	68	○
7.1.3	ICTs & business model creation†	34.5	131	○
7.1.4	ICTs & organizational model creation†	35.2	125	
7.2	Creative goods & services	8.1	105	
7.2.1	Cultural & creative services exports, % total trade	0.2	52	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	1.5	51	
7.2.4	Printing & publishing output manufactures, %◴	1.2	62	
7.2.5	Creative goods exports, % total trade	0.0	128	○
7.3	Online creativity	13.1	75	●
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.5	116	
7.3.2	Country-code TLDs/th pop. 15–69	0.1	121	
7.3.3	Wikipedia edits/pop. 15–69	399.7	95	
7.3.4	Video uploads on YouTube/pop. 15–69	48.7	66	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Angola

Key indicators

Population (millions)	22.1
GDP (US$ billions)	128.6
GDP per capita, PPP$	6,484.7
Income group	Upper-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**26.2**	**120**	
Innovation Output Sub-Index		26.5	80	●
Innovation Input Sub-Index		25.9	137	
Innovation Efficiency Ratio		1.0	1	●
Global Innovation Index 2014 (out of 143)		23.8	135	
1	**Institutions**	**35.2**	**135**	
1.1	Political environment	31.2	119	
1.1.1	Political stability*	55.0	86	●
1.1.2	Government effectiveness*	7.5	137	
1.2	Regulatory environment	35.5	134	
1.2.1	Regulatory quality*	19.8	130	
1.2.2	Rule of law*	13.6	138	
1.2.3	Cost of redundancy dismissal, salary weeks	31.0	130	
1.3	Business environment	39.0	138	
1.3.1	Ease of starting a business*	56.6	135	
1.3.2	Ease of resolving insolvency*	0.0	139	○
1.3.3	Ease of paying taxes*	60.4	110	
2	**Human capital & research**	**13.6**	**130**	
2.1	Education	34.9	102	●
2.1.1	Expenditure on education, % GDP◴	3.5	99	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years◴	11.3	101	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	27.4	102	
2.2	Tertiary education	5.8	133	
2.2.1	Tertiary enrolment, % gross◴	7.5	119	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	0.3	123	
2.3.1	Researchers, FTE/mn pop.◴	57.0	87	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**21.1**	**128**	
3.1	Information & communication technologies (ICTs)	22.3	119	
3.1.1	ICT access*	25.2	126	
3.1.2	ICT use*	10.6	109	
3.1.3	Government's online service*	29.9	106	
3.1.4	E-participation*	23.5	115	
3.2	General infrastructure	12.3	135	
3.2.1	Electricity output, kWh/cap	269.6	112	
3.2.2	Logistics performance*	19.5	104	
3.2.3	Gross capital formation, % GDP	14.8	125	
3.3	Ecological sustainability	28.7	102	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.5	29	●
3.3.2	Environmental performance*	28.7	130	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	131	
4	**Market sophistication**	**35.3**	**131**	
4.1	Credit	3.8	140	○
4.1.1	Ease of getting credit*	5.0	138	○
4.1.2	Domestic credit to private sector, % GDP	23.5	112	
4.1.3	Microfinance gross loans, % GDP◴	0.0	79	
4.2	Investment	51.7	23	
4.2.1	Ease of protecting investors*	51.7	83	●
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	50.3	137	
4.3.1	Applied tariff rate, weighted mean, %◴	7.4	103	●
4.3.2	Intensity of local competition†	26.7	133	○
5	**Business sophistication**	**24.3**	**126**	
5.1	Knowledge workers	26.5	102	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	23.5	82	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	23.2	111	
5.2.1	University/industry research collaboration†	16.9	132	○
5.2.2	State of cluster development†	26.3	131	○
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	23.2	124	
5.3.1	Royalty & license fees payments, % total trade◴	0.0	123	
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.9	64	●
5.3.4	FDI net inflows, % GDP	(3.5)	139	○
6	**Knowledge & technology outputs**	**30.8**	**45**	●
6.1	Knowledge creation	0.6	141	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	96	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	0.3	139	○
6.1.5	Citable documents H index	28.0	134	
6.2	Knowledge impact	43.7	43	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.0	43	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.3	134	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	48.2	21	●
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	83	●
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	4.9	10	●
7	**Creative outputs**	**22.2**	**112**	
7.1	Intangible assets	33.2	123	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	38.8	124	
7.1.4	ICTs & organizational model creation†	27.6	132	○
7.2	Creative goods & services	n/a	n/a	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	0.1	131	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.0	140	○
7.3.2	Country-code TLDs/th pop. 15–69	0.0	133	
7.3.3	Wikipedia edits/pop. 15–69	58.5	118	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Argentina

Key indicators

Population (millions)	41.8
GDP (US$ billions)	540.2
GDP per capita, PPP$	18,917.3
Income group	Upper-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**34.3**	**72**	
Innovation Output Sub-Index		29.4	63	
Innovation Input Sub-Index		39.2	81	
Innovation Efficiency Ratio		0.7	52	
Global Innovation Index 2014 (out of 143)		35.1	70	
1	**Institutions**	**48.0**	**111**	
1.1	Political environment	49.6	71	
1.1.1	Political stability*	65.6	61	
1.1.2	Government effectiveness*	33.6	85	
1.2	Regulatory environment	40.3	128	○
1.2.1	Regulatory quality*	21.5	128	○
1.2.2	Rule of law*	28.2	106	
1.2.3	Cost of redundancy dismissal, salary weeks	30.3	127	○
1.3	Business environment	54.2	120	
1.3.1	Ease of starting a business*	72.6	117	
1.3.2	Ease of resolving insolvency*	45.1	78	
1.3.3	Ease of paying taxes*	45.0	129	○
2	**Human capital & research**	**37.7**	**44**	
2.1	Education	49.8	54	
2.1.1	Expenditure on education, % GDP	5.1	52	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	19.6	59	
2.1.3	School life expectancy, years	17.9	6	●
2.1.4	PISA scales in reading, maths, & science	396.7	55	
2.1.5	Pupil-teacher ratio, secondary◴	10.9	32	
2.2	Tertiary education	39.1	48	
2.2.1	Tertiary enrolment, % gross	80.3	10	●
2.2.2	Graduates in science & engineering, %◴	13.5	89	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	24.1	39	
2.3.1	Researchers, FTE/mn pop.◴	1,255.8	43	
2.3.2	Gross expenditure on R&D, % GDP◴	0.6	56	
2.3.3	QS university ranking, average score top 3*	43.8	32	●
3	**Infrastructure**	**38.2**	**74**	
3.1	Information & communication technologies (ICTs)	52.6	52	
3.1.1	ICT access*	66.2	52	
3.1.2	ICT use*	34.2	61	
3.1.3	Government's online service*	55.1	55	
3.1.4	E-participation*	54.9	54	
3.2	General infrastructure	25.4	98	
3.2.1	Electricity output, kWh/cap	3,280.0	57	
3.2.2	Logistics performance*	42.1	58	
3.2.3	Gross capital formation, % GDP	18.0	111	
3.3	Ecological sustainability	36.6	76	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	8.2	49	
3.3.2	Environmental performance*	49.6	83	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.4	53	
4	**Market sophistication**	**35.9**	**127**	
4.1	Credit	17.9	118	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	15.8	126	○
4.1.3	Microfinance gross loans, % GDP	0.0	83	○
4.2	Investment	24.0	130	○
4.2.1	Ease of protecting investors*	57.5	60	
4.2.2	Market capitalization, % GDP	5.7	100	○
4.2.3	Total value of stocks traded, % GDP	0.2	87	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	58	
4.3	Trade & competition	65.9	113	
4.3.1	Applied tariff rate, weighted mean, %	5.6	87	
4.3.2	Intensity of local competition†	51.2	125	○
5	**Business sophistication**	**36.3**	**61**	
5.1	Knowledge workers	46.1	43	
5.1.1	Knowledge-intensive employment, %◴	24.6	58	
5.1.2	Firms offering formal training, % firms◴	63.6	6	●
5.1.3	GERD performed by business, % of GDP◴	0.1	55	
5.1.4	GERD financed by business, %◴	21.3	59	
5.1.5	Females employed w/advanced degrees, % total◴	16.9	31	
5.2	Innovation linkages	17.7	130	○
5.2.1	University/industry research collaboration†	43.9	64	
5.2.2	State of cluster development†	35.3	115	
5.2.3	GERD financed by abroad, %◴	0.6	94	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	85	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	61	
5.3	Knowledge absorption	45.0	26	●
5.3.1	Royalty & license fees payments, % total trade	2.6	6	●
5.3.2	High-tech imports less re-imports, % total trade	10.5	29	●
5.3.3	Comm., computer & info. services imp., % total trade	1.2	51	
5.3.4	FDI net inflows, % GDP	1.7	93	
6	**Knowledge & technology outputs**	**22.2**	**95**	
6.1	Knowledge creation	9.7	71	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.7	70	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.2	47	
6.1.4	Scientific & technical articles/bn PPP$ GDP	8.5	71	
6.1.5	Citable documents H index	249.0	35	●
6.2	Knowledge impact	30.0	104	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.4	62	
6.2.2	New businesses/th pop. 15–64	0.5	91	
6.2.3	Computer software spending, % GDP	0.2	71	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	7.1	49	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	27.0	72	
6.3.1	Royalty & license fees receipts, % total trade	0.1	48	
6.3.2	High-tech exports less re-exports, % total trade	2.6	45	
6.3.3	Comm., computer & info. services exp., % total trade	1.9	43	
6.3.4	FDI net outflows, % GDP	0.2	84	
7	**Creative outputs**	**36.5**	**50**	
7.1	Intangible assets	44.0	77	
7.1.1	Domestic res trademark app./bn PPP$ GDP	70.4	25	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	45.9	107	
7.1.4	ICTs & organizational model creation†	47.1	94	
7.2	Creative goods & services	20.4	65	
7.2.1	Cultural & creative services exports, % total trade	0.9	15	●
7.2.2	National feature films/mn pop. 15–69	5.9	33	
7.2.3	Global ent. & media output/th pop. 15–69	15.0	29	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.2	82	
7.3	Online creativity	37.8	36	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.6	65	
7.3.2	Country-code TLDs/th pop. 15–69	38.5	17	●
7.3.3	Wikipedia edits/pop. 15–69	3,777.6	35	●
7.3.4	Video uploads on YouTube/pop. 15–69	81.2	31	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Armenia

Key indicators

Population (millions)	3.0
GDP (US$ billions)	10.3
GDP per capita, PPP$	6,539.8
Income group	Lower-middle income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**37.3**	**61**	
Innovation Output Sub-Index		32.8	51	
Innovation Input Sub-Index		41.8	69	
Innovation Efficiency Ratio		0.8	34	
Global Innovation Index 2014 (out of 143)		36.1	65	
1	**Institutions**	**67.0**	**57**	
1.1	Political environment	54.5	59	
1.1.1	Political stability*	65.9	60	
1.1.2	Government effectiveness*	43.2	63	
1.2	Regulatory environment	70.3	53	
1.2.1	Regulatory quality*	53.9	62	
1.2.2	Rule of law*	39.3	79	
1.2.3	Cost of redundancy dismissal, salary weeks	11.0	41	
1.3	Business environment	76.0	42	
1.3.1	Ease of starting a business*	97.8	4	●
1.3.2	Ease of resolving insolvency*	48.1	66	
1.3.3	Ease of paying taxes*	82.1	36	
2	**Human capital & research**	**19.0**	**105**	
2.1	Education	26.4	127	○
2.1.1	Expenditure on education, % GDP	2.3	122	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	17.7	71	
2.1.3	School life expectancy, years◴	12.3	88	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	27.9	80	
2.2.1	Tertiary enrolment, % gross	46.1	58	
2.2.2	Graduates in science & engineering, %◴	15.9	78	
2.2.3	Tertiary inbound mobility, %	3.0	53	
2.3	Research & development (R&D)	2.7	98	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	0.2	83	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**37.3**	**76**	
3.1	Information & communication technologies (ICTs)	50.2	57	
3.1.1	ICT access*	56.4	68	
3.1.2	ICT use*	30.2	70	
3.1.3	Government's online service*	61.4	43	
3.1.4	E-participation*	52.9	59	
3.2	General infrastructure	25.4	97	
3.2.1	Electricity output, kWh/cap	2,705.7	66	
3.2.2	Logistics performance*	26.1	87	
3.2.3	Gross capital formation, % GDP	22.4	62	
3.3	Ecological sustainability	36.3	77	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.5	79	
3.3.2	Environmental performance*	61.7	45	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	120	○
4	**Market sophistication**	**54.7**	**36**	
4.1	Credit	59.6	11	●
4.1.1	Ease of getting credit*	65.0	34	
4.1.2	Domestic credit to private sector, % GDP	45.2	75	
4.1.3	Microfinance gross loans, % GDP	8.4	1	●
4.2	Investment	26.1	113	
4.2.1	Ease of protecting investors*	60.0	47	
4.2.2	Market capitalization, % GDP	1.3	107	○
4.2.3	Total value of stocks traded, % GDP	0.0	106	○
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	30	
4.3	Trade & competition	78.3	61	
4.3.1	Applied tariff rate, weighted mean, %	2.3	48	
4.3.2	Intensity of local competition†	64.5	82	
5	**Business sophistication**	**31.0**	**89**	
5.1	Knowledge workers	39.8	65	
5.1.1	Knowledge-intensive employment, %◴	26.9	52	
5.1.2	Firms offering formal training, % firms	14.2	101	○
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	27.4	5	●
5.2	Innovation linkages	20.8	122	○
5.2.1	University/industry research collaboration†	34.2	109	○
5.2.2	State of cluster development†	36.9	110	○
5.2.3	GERD financed by abroad, %	2.8	75	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.1	51	
5.3	Knowledge absorption	32.4	72	
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	5.7	87	
5.3.3	Comm., computer & info. services imp., % total trade	1.1	55	
5.3.4	FDI net inflows, % GDP	3.5	50	
6	**Knowledge & technology outputs**	**30.6**	**46**	
6.1	Knowledge creation	25.4	38	
6.1.1	Domestic resident patent app./bn PPP$ GDP	5.4	18	●
6.1.2	PCT resident patent app./bn PPP$ GDP	0.2	53	
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.7	17	
6.1.4	Scientific & technical articles/bn PPP$ GDP	28.5	27	●
6.1.5	Citable documents H index	116.0	61	
6.2	Knowledge impact	36.6	72	
6.2.1	Growth rate of PPP$ GDP/worker, %	4.6	11	●
6.2.2	New businesses/th pop. 15–64	1.5	54	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.7	119	○
6.2.5	High- & medium-high-tech manufactures, %	4.2	91	○
6.3	Knowledge diffusion	29.7	60	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.2	93	
6.3.3	Comm., computer & info. services exp., % total trade	2.8	21	●
6.3.4	FDI net outflows, % GDP	0.2	85	
7	**Creative outputs**	**35.1**	**55**	
7.1	Intangible assets	51.3	40	
7.1.1	Domestic res trademark app./bn PPP$ GDP	86.2	18	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.1	29	
7.1.3	ICTs & business model creation†	59.2	54	
7.1.4	ICTs & organizational model creation†	59.3	44	
7.2	Creative goods & services	23.7	53	
7.2.1	Cultural & creative services exports, % total trade	0.3	47	
7.2.2	National feature films/mn pop. 15–69	13.1	12	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	1.6	43	
7.2.5	Creative goods exports, % total trade	0.5	58	
7.3	Online creativity	14.1	74	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.4	67	
7.3.2	Country-code TLDs/th pop. 15–69	4.4	57	
7.3.3	Wikipedia edits/pop. 15–69	4,651.3	30	●
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Key indicators

Population (millions)	23.6
GDP (US$ billions)	1,444.2
GDP per capita, PPP$	44,345.9
Income group	High income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**55.2**	**17**	
Innovation Output Sub-Index		45.6	24	
Innovation Input Sub-Index		64.8	10	
Innovation Efficiency Ratio		0.7	72	
Global Innovation Index 2014 (out of 143)		55.0	17	
1	**Institutions**	**89.3**	**11**	
1.1	Political environment	87.3	13	
1.1.1	Political stability*	89.3	17	
1.1.2	Government effectiveness*	85.3	11	
1.2	Regulatory environment	93.8	12	
1.2.1	Regulatory quality*	95.4	7	●
1.2.2	Rule of law*	94.3	10	
1.2.3	Cost of redundancy dismissal, salary weeks	11.7	44	
1.3	Business environment	86.9	12	
1.3.1	Ease of starting a business*	96.5	7	●
1.3.2	Ease of resolving insolvency*	81.6	13	
1.3.3	Ease of paying taxes*	82.5	34	
2	**Human capital & research**	**57.0**	**9**	
2.1	Education	54.3	32	
2.1.1	Expenditure on education, % GDP	5.1	54	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	17.9	69	○
2.1.3	School life expectancy, years	20.2	1	●
2.1.4	PISA scales in reading, maths, & science	512.5	14	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	52.9	13	
2.2.1	Tertiary enrolment, % gross	86.3	6	●
2.2.2	Graduates in science & engineering, %◴	15.9	77	○
2.2.3	Tertiary inbound mobility, %	18.3	7	
2.3	Research & development (R&D)	63.9	10	
2.3.1	Researchers, FTE/mn pop.◴	4,280.4	16	
2.3.2	Gross expenditure on R&D, % GDP◴	2.3	15	
2.3.3	QS university ranking, average score top 3*	86.8	5	●
3	**Infrastructure**	**63.7**	**4**	●
3.1	Information & communication technologies (ICTs)	86.0	7	●
3.1.1	ICT access*	82.3	20	
3.1.2	ICT use*	74.8	11	
3.1.3	Government's online service*	92.9	8	
3.1.4	E-participation*	94.1	7	
3.2	General infrastructure	55.0	13	
3.2.1	Electricity output, kWh/cap	10,544.5	12	
3.2.2	Logistics performance*	84.1	16	
3.2.3	Gross capital formation, % GDP	26.9	37	
3.3	Ecological sustainability	50.1	27	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.9	69	○
3.3.2	Environmental performance*	82.4	3	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	3.2	31	
4	**Market sophistication**	**66.7**	**9**	
4.1	Credit	65.5	6	●
4.1.1	Ease of getting credit*	90.0	4	●
4.1.2	Domestic credit to private sector, % GDP	125.8	20	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	46.2	36	
4.2.1	Ease of protecting investors*	56.7	67	
4.2.2	Market capitalization, % GDP	83.8	19	
4.2.3	Total value of stocks traded, % GDP	68.5	11	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	29	
4.3	Trade & competition	88.5	10	
4.3.1	Applied tariff rate, weighted mean, %◴	1.8	43	
4.3.2	Intensity of local competition†	83.2	6	●
5	**Business sophistication**	**47.4**	**23**	
5.1	Knowledge workers	66.7	10	
5.1.1	Knowledge-intensive employment, %	43.8	15	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	1.3	16	
5.1.4	GERD financed by business, %◴	61.9	7	
5.1.5	Females employed w/advanced degrees, % total	22.6	15	
5.2	Innovation linkages	41.2	38	
5.2.1	University/industry research collaboration†	64.1	20	
5.2.2	State of cluster development†	53.1	40	
5.2.3	GERD financed by abroad, %◴	1.6	84	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	10	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.7	20	
5.3	Knowledge absorption	34.4	63	
5.3.1	Royalty & license fees payments, % total trade	1.2	20	
5.3.2	High-tech imports less re-imports, % total trade	9.6	37	
5.3.3	Comm., computer & info. services imp., % total trade	0.7	78	○
5.3.4	FDI net inflows, % GDP	3.2	60	
6	**Knowledge & technology outputs**	**34.8**	**39**	
6.1	Knowledge creation	34.9	26	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.9	34	
6.1.2	PCT resident patent app./bn PPP$ GDP	1.6	26	
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.1	26	
6.1.4	Scientific & technical articles/bn PPP$ GDP	47.7	10	
6.1.5	Citable documents H index	583.0	10	
6.2	Knowledge impact	46.2	32	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.4	64	
6.2.2	New businesses/th pop. 15–64	12.2	8	
6.2.3	Computer software spending, % GDP	0.3	46	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	12.5	31	
6.2.5	High- & medium-high-tech manufactures, %	20.4	56	
6.3	Knowledge diffusion	23.2	99	○
6.3.1	Royalty & license fees receipts, % total trade	0.2	32	
6.3.2	High-tech exports less re-exports, % total trade	1.7	54	
6.3.3	Comm., computer & info. services exp., % total trade	0.9	79	○
6.3.4	FDI net outflows, % GDP	(0.3)	114	○
7	**Creative outputs**	**56.5**	**7**	●
7.1	Intangible assets	53.3	34	
7.1.1	Domestic res trademark app./bn PPP$ GDP	65.9	31	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.4	23	
7.1.3	ICTs & business model creation†	64.3	34	
7.1.4	ICTs & organizational model creation†	69.3	17	
7.2	Creative goods & services	44.8	7	
7.2.1	Cultural & creative services exports, % total trade	0.1	61	○
7.2.2	National feature films/mn pop. 15–69	1.6	64	○
7.2.3	Global ent. & media output/th pop. 15–69	68.2	3	●
7.2.4	Printing & publishing output manufactures, %◴	6.1	1	●
7.2.5	Creative goods exports, % total trade	0.6	51	
7.3	Online creativity	74.4	6	●
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	77.6	10	
7.3.2	Country-code TLDs/th pop. 15–69	73.2	14	
7.3.3	Wikipedia edits/pop. 15–69	7,868.5	9	
7.3.4	Video uploads on YouTube/pop. 15–69	88.6	17	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Austria

Key indicators

Population (millions)	8.5
GDP (US$ billions)	437.1
GDP per capita, PPP$	43,796.0
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**54.1**	**18**	
Innovation Output Sub-Index		47.2	18	
Innovation Input Sub-Index		60.9	19	
Innovation Efficiency Ratio		0.8	37	
Global Innovation Index 2014 (out of 143)		53.4	20	
1	**Institutions**	**88.7**	**12**	●
1.1	Political environment	90.5	9	●
1.1.1	Political stability*	97.4	4	●
1.1.2	Government effectiveness*	83.7	15	
1.2	Regulatory environment	95.9	8	●
1.2.1	Regulatory quality*	87.2	17	
1.2.2	Rule of law*	96.3	6	●
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	79.5	31	
1.3.1	Ease of starting a business*	83.4	82	○
1.3.2	Ease of resolving insolvency*	78.8	15	
1.3.3	Ease of paying taxes*	76.4	58	○
2	**Human capital & research**	**57.4**	**8**	●
2.1	Education	56.3	22	
2.1.1	Expenditure on education, % GDP	5.8	35	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	30.5	22	
2.1.3	School life expectancy, years	15.7	28	
2.1.4	PISA scales in reading, maths, & science	500.3	18	
2.1.5	Pupil-teacher ratio, secondary	9.5	23	
2.2	Tertiary education	57.5	7	●
2.2.1	Tertiary enrolment, % gross	72.4	22	
2.2.2	Graduates in science & engineering, %	25.4	22	
2.2.3	Tertiary inbound mobility, %	15.4	11	●
2.3	Research & development (R&D)	58.3	16	
2.3.1	Researchers, FTE/mn pop.	4,699.5	11	●
2.3.2	Gross expenditure on R&D, % GDP	2.9	9	●
2.3.3	QS university ranking, average score top 3*	49.8	26	
3	**Infrastructure**	**55.2**	**23**	
3.1	Information & communication technologies (ICTs)	70.8	25	
3.1.1	ICT access*	82.8	17	
3.1.2	ICT use*	62.8	22	
3.1.3	Government's online service*	74.8	23	
3.1.4	E-participation*	62.7	40	
3.2	General infrastructure	42.7	33	
3.2.1	Electricity output, kWh/cap	7,618.9	25	
3.2.2	Logistics performance*	75.9	21	
3.2.3	Gross capital formation, % GDP	20.9	74	○
3.3	Ecological sustainability	52.2	21	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.3	35	
3.3.2	Environmental performance*	78.3	8	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.8	38	
4	**Market sophistication**	**56.5**	**30**	
4.1	Credit	48.1	28	
4.1.1	Ease of getting credit*	60.0	48	
4.1.2	Domestic credit to private sector, % GDP	112.1	26	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	32.8	79	○
4.2.1	Ease of protecting investors*	63.3	31	
4.2.2	Market capitalization, % GDP	26.0	61	○
4.2.3	Total value of stocks traded, % GDP	11.6	37	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	26	
4.3	Trade & competition	88.5	12	●
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	80.3	13	●
5	**Business sophistication**	**47.0**	**24**	
5.1	Knowledge workers	56.1	27	
5.1.1	Knowledge-intensive employment, %	39.8	24	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	2.0	10	
5.1.4	GERD financed by business, %	44.5	28	
5.1.5	Females employed w/advanced degrees, % total	10.3	62	○
5.2	Innovation linkages	43.6	26	
5.2.1	University/industry research collaboration†	61.3	23	
5.2.2	State of cluster development†	65.8	15	
5.2.3	GERD financed by abroad, %	16.4	27	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	64	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	1.4	12	●
5.3	Knowledge absorption	41.3	37	
5.3.1	Royalty & license fees payments, % total trade	0.8	38	
5.3.2	High-tech imports less re-imports, % total trade	8.9	49	
5.3.3	Comm., computer & info. services imp., % total trade	1.8	23	
5.3.4	FDI net inflows, % GDP	3.3	52	
6	**Knowledge & technology outputs**	**43.0**	**17**	
6.1	Knowledge creation	37.9	23	
6.1.1	Domestic resident patent app./bn PPP$ GDP	5.6	16	
6.1.2	PCT resident patent app./bn PPP$ GDP	3.5	14	
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.5	20	
6.1.4	Scientific & technical articles/bn PPP$ GDP	34.6	21	
6.1.5	Citable documents H index	416.0	17	
6.2	Knowledge impact	41.3	51	
6.2.1	Growth rate of PPP$ GDP/worker, %	(0.0)	100	○
6.2.2	New businesses/th pop. 15–64	0.5	89	○
6.2.3	Computer software spending, % GDP	0.6	13	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	11.9	34	
6.2.5	High- & medium-high-tech manufactures, %	42.4	18	
6.3	Knowledge diffusion	49.9	16	
6.3.1	Royalty & license fees receipts, % total trade	0.5	24	
6.3.2	High-tech exports less re-exports, % total trade	9.0	24	
6.3.3	Comm., computer & info. services exp., % total trade	2.8	20	
6.3.4	FDI net outflows, % GDP	3.8	17	
7	**Creative outputs**	**51.3**	**17**	
7.1	Intangible assets	54.9	30	
7.1.1	Domestic res trademark app./bn PPP$ GDP	69.8	26	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	2.5	7	●
7.1.3	ICTs & business model creation†	65.4	31	
7.1.4	ICTs & organizational model creation†	58.5	47	
7.2	Creative goods & services	33.7	31	
7.2.1	Cultural & creative services exports, % total trade	0.7	26	
7.2.2	National feature films/mn pop. 15–69	7.5	25	
7.2.3	Global ent. & media output/th pop. 15–69	55.4	9	
7.2.4	Printing & publishing output manufactures, %	1.5	45	○
7.2.5	Creative goods exports, % total trade	1.4	34	
7.3	Online creativity	61.7	15	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	43.5	20	
7.3.2	Country-code TLDs/th pop. 15–69	85.5	9	●
7.3.3	Wikipedia edits/pop. 15–69	4,879.5	26	
7.3.4	Video uploads on YouTube/pop. 15–69	81.8	30	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Azerbaijan

Key indicators

Population (millions)	9.5
GDP (US$ billions)	74.1
GDP per capita, PPP$	11,675.7
Income group	Upper-middle income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**30.1**	**93**	
Innovation Output Sub-Index		22.6	103	
Innovation Input Sub-Index		37.6	89	
Innovation Efficiency Ratio		0.6	115	
Global Innovation Index 2014 (out of 143)		29.6	101	
1	**Institutions**	**56.2**	**81**	
1.1	Political environment	41.6	94	
1.1.1	Political stability*	54.0	90	
1.1.2	Government effectiveness*	29.1	95	
1.2	Regulatory environment	53.0	107	
1.2.1	Regulatory quality*	36.5	105	
1.2.2	Rule of law*	29.7	103	
1.2.3	Cost of redundancy dismissal, salary weeks	21.7	101	
1.3	Business environment	74.1	51	
1.3.1	Ease of starting a business*	95.5	12	●
1.3.2	Ease of resolving insolvency*	43.0	88	
1.3.3	Ease of paying taxes*	83.8	30	●
2	**Human capital & research**	**21.9**	**100**	
2.1	Education	31.2	114	
2.1.1	Expenditure on education, % GDP	2.4	121	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	11.9	92	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	22.1	97	
2.2.1	Tertiary enrolment, % gross	20.4	90	
2.2.2	Graduates in science & engineering, %	16.2	73	
2.2.3	Tertiary inbound mobility, %	2.5	59	
2.3	Research & development (R&D)	12.3	62	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	0.2	88	
2.3.3	QS university ranking, average score top 3*	19.8	54	
3	**Infrastructure**	**37.1**	**78**	
3.1	Information & communication technologies (ICTs)	47.8	69	
3.1.1	ICT access*	60.7	65	
3.1.2	ICT use*	44.0	49	
3.1.3	Government's online service*	43.3	76	
3.1.4	E-participation*	43.1	76	
3.2	General infrastructure	23.5	107	
3.2.1	Electricity output, kWh/cap	2,471.8	71	
3.2.2	Logistics performance*	14.7	115	○
3.2.3	Gross capital formation, % GDP	23.5	53	
3.3	Ecological sustainability	40.1	59	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.6	28	●
3.3.2	Environmental performance*	55.5	58	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	90	
4	**Market sophistication**	**52.0**	**47**	●
4.1	Credit	26.8	83	
4.1.1	Ease of getting credit*	40.0	93	
4.1.2	Domestic credit to private sector, % GDP	25.5	107	
4.1.3	Microfinance gross loans, % GDP	2.8	18	●
4.2	Investment	59.2	10	
4.2.1	Ease of protecting investors*	59.2	49	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	70.1	95	
4.3.1	Applied tariff rate, weighted mean, %	4.5	76	
4.3.2	Intensity of local competition†	55.8	116	○
5	**Business sophistication**	**20.7**	**136**	○
5.1	Knowledge workers	23.8	110	
5.1.1	Knowledge-intensive employment, %	23.4	64	
5.1.2	Firms offering formal training, % firms	20.3	90	
5.1.3	GERD performed by business, % of GDP	0.0	77	
5.1.4	GERD financed by business, %	4.6	74	
5.1.5	Females employed w/advanced degrees, % total	12.9	49	
5.2	Innovation linkages	17.4	133	○
5.2.1	University/industry research collaboration†	36.0	101	
5.2.2	State of cluster development†	40.1	96	
5.2.3	GERD financed by abroad, %	0.2	97	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	78	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	91	
5.3	Knowledge absorption	21.0	134	○
5.3.1	Royalty & license fees payments, % total trade◴	0.1	101	
5.3.2	High-tech imports less re-imports, % total trade	3.9	112	○
5.3.3	Comm., computer & info. services imp., % total trade	0.5	91	
5.3.4	FDI net inflows, % GDP	3.6	49	●
6	**Knowledge & technology outputs**	**19.0**	**108**	
6.1	Knowledge creation	2.8	130	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.0	61	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	99	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.1	57	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.7	120	
6.1.5	Citable documents H index	50.0	116	
6.2	Knowledge impact	33.0	94	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.9	31	●
6.2.2	New businesses/th pop. 15–64	0.7	81	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.6	102	
6.2.5	High- & medium-high-tech manufactures, %	10.9	73	
6.3	Knowledge diffusion	21.2	107	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	114	○
6.3.2	High-tech exports less re-exports, % total trade	0.3	92	
6.3.3	Comm., computer & info. services exp., % total trade	0.4	99	
6.3.4	FDI net outflows, % GDP	2.0	34	●
7	**Creative outputs**	**26.2**	**93**	
7.1	Intangible assets	39.8	91	
7.1.1	Domestic res trademark app./bn PPP$ GDP	22.4	77	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.2	49	
7.1.3	ICTs & business model creation†	63.2	40	●
7.1.4	ICTs & organizational model creation†	62.5	26	●
7.2	Creative goods & services	20.1	68	
7.2.1	Cultural & creative services exports, % total trade	0.0	69	
7.2.2	National feature films/mn pop. 15–69	26.1	1	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	0.7	83	
7.2.5	Creative goods exports, % total trade	0.0	125	○
7.3	Online creativity	5.1	92	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.3	100	
7.3.2	Country-code TLDs/th pop. 15–69	1.4	84	
7.3.3	Wikipedia edits/pop. 15–69	1,709.4	59	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Bahrain

Key indicators

Population (millions)	1.3
GDP (US$ billions)	33.9
GDP per capita, PPP$	36,039.2
Income group	High income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**37.7**	**59**	
Innovation Output Sub-Index		29.1	65	
Innovation Input Sub-Index		46.2	48	
Innovation Efficiency Ratio		0.6	105	
Global Innovation Index 2014 (out of 143)		36.3	62	
1	**Institutions**	**65.3**	**58**	
1.1	Political environment	44.1	83	
1.1.1	Political stability*	31.0	132	○
1.1.2	Government effectiveness*	57.2	43	
1.2	Regulatory environment	80.2	31	
1.2.1	Regulatory quality*	63.8	45	
1.2.2	Rule of law*	57.0	51	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	71.7	59	
1.3.1	Ease of starting a business*	76.9	107	
1.3.2	Ease of resolving insolvency*	44.2	82	
1.3.3	Ease of paying taxes*	93.9	8	●
2	**Human capital & research**	**28.4**	**71**	
2.1	Education	44.6	70	
2.1.1	Expenditure on education, % GDP	2.7	114	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	n/a	n/a	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	9.8	28	
2.2	Tertiary education	33.2	65	
2.2.1	Tertiary enrolment, % gross	33.5	72	
2.2.2	Graduates in science & engineering, %	17.9	64	
2.2.3	Tertiary inbound mobility, %	8.5	21	
2.3	Research & development (R&D)	7.5	74	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	0.0	115	○
2.3.3	QS university ranking, average score top 3*	14.3	59	
3	**Infrastructure**	**52.5**	**27**	
3.1	Information & communication technologies (ICTs)	81.0	10	●
3.1.1	ICT access*	77.2	29	
3.1.2	ICT use*	70.6	16	●
3.1.3	Government's online service*	93.7	7	●
3.1.4	E-participation*	82.4	14	●
3.2	General infrastructure	47.7	21	●
3.2.1	Electricity output, kWh/cap	18,765.2	4	●
3.2.2	Logistics performance*	47.0	50	
3.2.3	Gross capital formation, % GDP	18.9	102	
3.3	Ecological sustainability	28.8	100	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	3.8	112	○
3.3.2	Environmental performance*	51.8	73	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.1	64	
4	**Market sophistication**	**46.8**	**71**	
4.1	Credit	30.9	70	
4.1.1	Ease of getting credit*	40.0	93	
4.1.2	Domestic credit to private sector, % GDP	69.1	51	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	33.2	77	
4.2.1	Ease of protecting investors*	50.0	91	
4.2.2	Market capitalization, % GDP	52.2	36	
4.2.3	Total value of stocks traded, % GDP	1.0	65	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	76.3	68	
4.3.1	Applied tariff rate, weighted mean, %	5.7	89	
4.3.2	Intensity of local competition†	72.6	44	
5	**Business sophistication**	**38.1**	**48**	
5.1	Knowledge workers	n/a	n/a	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	47.3	19	●
5.2.1	University/industry research collaboration†	37.9	87	
5.2.2	State of cluster development†	55.6	31	
5.2.3	GERD financed by abroad, %	30.4	15	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.1	1	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	75	
5.3	Knowledge absorption	28.9	96	
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	4.2	109	
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	3.0	65	
6	**Knowledge & technology outputs**	**25.0**	**75**	
6.1	Knowledge creation	1.9	137	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.1	106	○
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	85	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.6	121	○
6.1.5	Citable documents H index	43.0	122	○
6.2	Knowledge impact	34.5	86	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.5	61	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.3	27	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	4.8	64	
6.2.5	High- & medium-high-tech manufactures, %	9.9	78	
6.3	Knowledge diffusion	38.6	36	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.0	123	○
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	3.2	21	●
7	**Creative outputs**	**33.2**	**65**	
7.1	Intangible assets	42.8	84	
7.1.1	Domestic res trademark app./bn PPP$ GDP	7.4	97	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	64.2	36	
7.1.4	ICTs & organizational model creation†	61.6	30	
7.2	Creative goods & services	23.2	56	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	34.8	1	●
7.2.3	Global ent. & media output/th pop. 15–69	8.5	38	
7.2.4	Printing & publishing output manufactures, %	1.0	72	
7.2.5	Creative goods exports, % total trade	0.0	126	○
7.3	Online creativity	24.0	54	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	6.7	54	
7.3.2	Country-code TLDs/th pop. 15–69	1.8	74	
7.3.3	Wikipedia edits/pop. 15–69	1,547.7	64	
7.3.4	Video uploads on YouTube/pop. 15–69	75.9	44	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Bangladesh

Key indicators

Population (millions)	158.5
GDP (US$ billions)	185.4
GDP per capita, PPP$	2,215.6
Income group	Low income
Region	Central and Southern Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**23.7**	**129**	
Innovation Output Sub-Index		17.9	126	
Innovation Input Sub-Index		29.5	129	
Innovation Efficiency Ratio		0.6	112	
Global Innovation Index 2014 (out of 143)		24.4	129	
1	**Institutions**	**40.9**	**129**	
1.1	Political environment	21.8	133	
1.1.1	Political stability*	24.3	134	○
1.1.2	Government effectiveness*	19.2	119	
1.2	Regulatory environment	39.4	129	
1.2.1	Regulatory quality*	23.1	124	
1.2.2	Rule of law*	25.5	115	
1.2.3	Cost of redundancy dismissal, salary weeks	31.0	129	
1.3	Business environment	61.6	97	
1.3.1	Ease of starting a business*	81.4	94	
1.3.2	Ease of resolving insolvency*	29.5	124	
1.3.3	Ease of paying taxes*	74.0	65	●
2	**Human capital & research**	**14.5**	**126**	
2.1	Education	20.7	135	○
2.1.1	Expenditure on education, % GDP◴	2.2	123	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	13.9	88	
2.1.3	School life expectancy, years◴	10.0	116	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	32.2	111	
2.2	Tertiary education	17.3	108	
2.2.1	Tertiary enrolment, % gross	13.2	103	
2.2.2	Graduates in science & engineering, %	15.6	80	
2.2.3	Tertiary inbound mobility, %◴	0.1	111	○
2.3	Research & development (R&D)	5.6	80	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	5.6	67	
3	**Infrastructure**	**27.3**	**109**	
3.1	Information & communication technologies (ICTs)	25.6	112	
3.1.1	ICT access*	25.7	124	
3.1.2	ICT use*	2.7	128	
3.1.3	Government's online service*	34.6	92	
3.1.4	E-participation*	39.2	82	
3.2	General infrastructure	28.3	78	
3.2.1	Electricity output, kWh/cap	317.0	109	
3.2.2	Logistics performance*	20.5	101	
3.2.3	Gross capital formation, % GDP	29.2	24	●
3.3	Ecological sustainability	28.0	106	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.8	26	●
3.3.2	Environmental performance*	25.6	136	○
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	125	
4	**Market sophistication**	**39.0**	**115**	
4.1	Credit	23.0	99	
4.1.1	Ease of getting credit*	30.0	113	
4.1.2	Domestic credit to private sector, % GDP	41.8	81	
4.1.3	Microfinance gross loans, % GDP	2.2	24	●
4.2	Investment	34.3	74	
4.2.1	Ease of protecting investors*	60.8	41	●
4.2.2	Market capitalization, % GDP	13.1	80	
4.2.3	Total value of stocks traded, % GDP	9.4	40	●
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	59.8	129	
4.3.1	Applied tariff rate, weighted mean, %◴	13.0	133	○
4.3.2	Intensity of local competition†	65.4	76	
5	**Business sophistication**	**25.6**	**122**	
5.1	Knowledge workers	28.7	97	
5.1.1	Knowledge-intensive employment, %◴	20.0	73	
5.1.2	Firms offering formal training, % firms	21.9	87	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	25.2	100	
5.2.1	University/industry research collaboration†	26.0	126	
5.2.2	State of cluster development†	47.5	63	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	73	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	108	○
5.3	Knowledge absorption	23.0	126	
5.3.1	Royalty & license fees payments, % total trade◴	0.0	113	
5.3.2	High-tech imports less re-imports, % total trade	9.4	41	●
5.3.3	Comm., computer & info. services imp., % total trade◴	0.1	121	○
5.3.4	FDI net inflows, % GDP	1.2	108	
6	**Knowledge & technology outputs**	**17.6**	**116**	
6.1	Knowledge creation	5.1	103	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.1	97	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.8	117	
6.1.5	Citable documents H index	112.0	65	●
6.2	Knowledge impact	29.4	106	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.4	24	●
6.2.2	New businesses/th pop. 15–64	0.1	101	○
6.2.3	Computer software spending, % GDP	0.2	72	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.5	123	
6.2.5	High- & medium-high-tech manufactures, %◴	10.9	74	
6.3	Knowledge diffusion	18.3	117	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	110	○
6.3.2	High-tech exports less re-exports, % total trade	0.1	102	
6.3.3	Comm., computer & info. services exp., % total trade◴	1.3	69	
6.3.4	FDI net outflows, % GDP	0.0	103	
7	**Creative outputs**	**18.3**	**124**	
7.1	Intangible assets	32.0	126	
7.1.1	Domestic res trademark app./bn PPP$ GDP	16.1	92	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	45.7	109	
7.1.4	ICTs & organizational model creation†	42.5	107	
7.2	Creative goods & services	8.7	102	
7.2.1	Cultural & creative services exports, % total trade	0.0	86	○
7.2.2	National feature films/mn pop. 15–69	0.5	94	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	1.5	46	●
7.2.5	Creative goods exports, % total trade◴	0.1	98	
7.3	Online creativity	0.4	118	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.4	120	
7.3.2	Country-code TLDs/th pop. 15–69	0.0	132	
7.3.3	Wikipedia edits/pop. 15–69	121.6	111	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Barbados

Key indicators

Population (millions)	0.3
GDP (US$ billions)	4.3
GDP per capita, PPP$	25,193.3
Income group	High income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**42.5**	**37**	
Innovation Output Sub-Index		38.0	36	
Innovation Input Sub-Index		46.9	46	
Innovation Efficiency Ratio		0.8	25	
Global Innovation Index 2014 (out of 143)		40.8	41	
1	**Institutions**	**79.8**	**27**	
1.1	Political environment	86.9	15	●
1.1.1	Political stability*	96.1	8	●
1.1.2	Government effectiveness*	77.8	23	●
1.2	Regulatory environment	75.4	41	
1.2.1	Regulatory quality*	59.2	54	
1.2.2	Rule of law*	74.2	28	
1.2.3	Cost of redundancy dismissal, salary weeks	16.0	73	
1.3	Business environment	77.1	36	
1.3.1	Ease of starting a business*	84.4	77	
1.3.2	Ease of resolving insolvency*	74.1	24	●
1.3.3	Ease of paying taxes*	73.0	74	
2	**Human capital & research**	**30.5**	**62**	
2.1	Education	49.9	52	
2.1.1	Expenditure on education, % GDP	5.6	39	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	25.0	39	
2.1.3	School life expectancy, years◴	15.4	34	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	14.6	60	
2.2	Tertiary education	41.5	39	
2.2.1	Tertiary enrolment, % gross◴	60.8	40	
2.2.2	Graduates in science & engineering, %◴	15.0	83	○
2.2.3	Tertiary inbound mobility, %◴	13.8	12	●
2.3	Research & development (R&D)	-	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	-	73	○
3	**Infrastructure**	**29.2**	**100**	
3.1	Information & communication technologies (ICTs)	40.6	83	
3.1.1	ICT access*	78.6	24	
3.1.2	ICT use*	52.0	37	
3.1.3	Government's online service*	22.0	119	○
3.1.4	E-participation*	9.8	133	○
3.2	General infrastructure	13.6	134	○
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	n/a	n/a	
3.2.3	Gross capital formation, % GDP	14.5	127	○
3.3	Ecological sustainability	33.3	86	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	45.5	93	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.1	62	
4	**Market sophistication**	**41.5**	**105**	
4.1	Credit	30.3	72	
4.1.1	Ease of getting credit*	35.0	102	○
4.1.2	Domestic credit to private sector, % GDP◴	80.6	39	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	31.9	85	
4.2.1	Ease of protecting investors*	30.8	138	○
4.2.2	Market capitalization, % GDP	106.4	11	●
4.2.3	Total value of stocks traded, % GDP	0.4	80	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	62.2	122	○
4.3.1	Applied tariff rate, weighted mean, %◴	14.8	135	○
4.3.2	Intensity of local competition†	76.4	26	
5	**Business sophistication**	**53.8**	**12**	
5.1	Knowledge workers	47.0	41	
5.1.1	Knowledge-intensive employment, %	30.9	46	
5.1.2	Firms offering formal training, % firms◴	35.5	50	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	60.5	4	●
5.2.1	University/industry research collaboration†	49.9	41	
5.2.2	State of cluster development†	46.1	71	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	6.7	1	●
5.3	Knowledge absorption	53.7	8	●
5.3.1	Royalty & license fees payments, % total trade◴	0.9	34	
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade◴	1.9	20	●
5.3.4	FDI net inflows, % GDP◴	12.2	8	●
6	**Knowledge & technology outputs**	**42.4**	**18**	●
6.1	Knowledge creation	32.7	30	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.7	71	
6.1.2	PCT resident patent app./bn PPP$ GDP	38.8	1	●
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	14.2	52	
6.1.5	Citable documents H index	55.0	113	○
6.2	Knowledge impact	36.5	73	
6.2.1	Growth rate of PPP$ GDP/worker, %	(1.0)	110	○
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	10.3	40	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	58.0	8	●
6.3.1	Royalty & license fees receipts, % total trade◴	0.2	42	
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade◴	1.8	47	
6.3.4	FDI net outflows, % GDP◴	7.7	7	●
7	**Creative outputs**	**33.6**	**63**	
7.1	Intangible assets	44.3	75	
7.1.1	Domestic res trademark app./bn PPP$ GDP	49.7	53	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	53.5	76	
7.1.4	ICTs & organizational model creation†	52.3	68	
7.2	Creative goods & services	n/a	n/a	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	12.2	76	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	19.3	31	
7.3.2	Country-code TLDs/th pop. 15–69	1.7	77	
7.3.3	Wikipedia edits/pop. 15–69	2,125.3	51	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Belarus

Key indicators

Population (millions)	9.3
GDP (US$ billions)	76.1
GDP per capita, PPP$	16,327.4
Income group	Upper-middle income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**38.2**	**53**	
Innovation Output Sub-Index		31.5	58	
Innovation Input Sub-Index		44.9	55	
Innovation Efficiency Ratio		0.7	73	
Global Innovation Index 2014 (out of 143)		37.1	58	
1	**Institutions**	**53.2**	**94**	
1.1	Political environment	39.7	101	
1.1.1	Political stability*	63.5	66	
1.1.2	Government effectiveness*	15.9	127	○
1.2	Regulatory environment	47.1	118	○
1.2.1	Regulatory quality*	18.7	132	○
1.2.2	Rule of law*	24.0	119	○
1.2.3	Cost of redundancy dismissal, salary weeks	21.7	101	○
1.3	Business environment	72.8	55	
1.3.1	Ease of starting a business*	91.9	35	
1.3.2	Ease of resolving insolvency*	48.2	65	
1.3.3	Ease of paying taxes*	78.3	50	
2	**Human capital & research**	**43.0**	**32**	●
2.1	Education	63.2	7	●
2.1.1	Expenditure on education, % GDP	5.1	53	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	15.7	29	●
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	7.8	2	●
2.2	Tertiary education	49.9	18	●
2.2.1	Tertiary enrolment, % gross	92.9	5	●
2.2.2	Graduates in science & engineering, %	27.2	17	●
2.2.3	Tertiary inbound mobility, %	2.4	60	
2.3	Research & development (R&D)	15.8	53	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	0.7	49	
2.3.3	QS university ranking, average score top 3*	15.5	57	
3	**Infrastructure**	**42.0**	**60**	
3.1	Information & communication technologies (ICTs)	47.8	67	
3.1.1	ICT access*	73.9	35	
3.1.2	ICT use*	49.9	38	
3.1.3	Government's online service*	32.3	95	
3.1.4	E-participation*	35.3	88	
3.2	General infrastructure	42.3	36	
3.2.1	Electricity output, kWh/cap	3,255.7	58	
3.2.2	Logistics performance*	24.3	94	
3.2.3	Gross capital formation, % GDP	37.7	8	●
3.3	Ecological sustainability	35.7	79	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.7	102	○
3.3.2	Environmental performance*	67.7	32	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	88	
4	**Market sophistication**	**56.1**	**32**	●
4.1	Credit	23.3	97	
4.1.1	Ease of getting credit*	40.0	93	
4.1.2	Domestic credit to private sector, % GDP	24.1	110	○
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	51.7	23	
4.2.1	Ease of protecting investors*	51.7	83	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	93.3	2	●
4.3.1	Applied tariff rate, weighted mean, %	2.0	45	
4.3.2	Intensity of local competition†	n/a	n/a	
5	**Business sophistication**	**30.3**	**94**	
5.1	Knowledge workers	59.6	23	●
5.1.1	Knowledge-intensive employment, %	35.9	33	
5.1.2	Firms offering formal training, % firms	51.1	25	●
5.1.3	GERD performed by business, % of GDP	0.4	35	
5.1.4	GERD financed by business, %	43.8	32	
5.1.5	Females employed w/advanced degrees, % total	33.8	1	●
5.2	Innovation linkages	8.1	137	○
5.2.1	University/industry research collaboration†	n/a	n/a	
5.2.2	State of cluster development†	n/a	n/a	
5.2.3	GERD financed by abroad, %	7.9	49	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	61	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	76	
5.3	Knowledge absorption	23.2	125	○
5.3.1	Royalty & license fees payments, % total trade	0.3	73	
5.3.2	High-tech imports less re-imports, % total trade	5.7	88	
5.3.3	Comm., computer & info. services imp., % total trade	0.4	99	○
5.3.4	FDI net inflows, % GDP	3.1	63	
6	**Knowledge & technology outputs**	**37.1**	**32**	●
6.1	Knowledge creation	48.2	15	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	8.9	7	●
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	66	
6.1.3	Domestic res utility model app./bn PPP$ GDP	6.3	1	●
6.1.4	Scientific & technical articles/bn PPP$ GDP	6.3	90	
6.1.5	Citable documents H index	114.0	63	
6.2	Knowledge impact	38.9	61	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.8	35	
6.2.2	New businesses/th pop. 15–64	1.1	63	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.8	118	○
6.2.5	High- & medium-high-tech manufactures, %	31.4	35	
6.3	Knowledge diffusion	24.1	90	
6.3.1	Royalty & license fees receipts, % total trade	0.1	65	
6.3.2	High-tech exports less re-exports, % total trade	1.8	52	
6.3.3	Comm., computer & info. services exp., % total trade	1.7	54	
6.3.4	FDI net outflows, % GDP	0.4	72	
7	**Creative outputs**	**26.0**	**94**	
7.1	Intangible assets	44.9	70	
7.1.1	Domestic res trademark app./bn PPP$ GDP	97.0	14	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.1	28	
7.1.3	ICTs & business model creation†	n/a	n/a	
7.1.4	ICTs & organizational model creation†	n/a	n/a	
7.2	Creative goods & services	6.6	113	○
7.2.1	Cultural & creative services exports, % total trade	0.0	72	○
7.2.2	National feature films/mn pop. 15–69	0.6	91	○
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.4	65	
7.3	Online creativity	7.7	84	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.0	88	
7.3.2	Country-code TLDs/th pop. 15–69	7.3	47	
7.3.3	Wikipedia edits/pop. 15–69	1,864.6	57	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Belgium

Key indicators

Population (millions)	11.1
GDP (US$ billions)	534.7
GDP per capita, PPP$	38,826.5
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**50.9**	**25**	
Innovation Output Sub-Index		43.2	28	
Innovation Input Sub-Index		58.6	21	
Innovation Efficiency Ratio		0.7	59	
Global Innovation Index 2014 (out of 143)		51.7	23	
1	**Institutions**	**83.3**	**19**	
1.1	Political environment	85.6	17	
1.1.1	Political stability*	86.8	27	
1.1.2	Government effectiveness*	84.4	14	●
1.2	Regulatory environment	80.2	30	
1.2.1	Regulatory quality*	82.2	19	
1.2.2	Rule of law*	85.0	20	
1.2.3	Cost of redundancy dismissal, salary weeks	19.7	90	○
1.3	Business environment	84.2	18	
1.3.1	Ease of starting a business*	94.4	14	●
1.3.2	Ease of resolving insolvency*	83.9	10	●
1.3.3	Ease of paying taxes*	74.2	63	
2	**Human capital & research**	**51.4**	**18**	
2.1	Education	57.1	19	
2.1.1	Expenditure on education, % GDP	6.5	22	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	38.6	8	●
2.1.3	School life expectancy, years	16.3	18	
2.1.4	PISA scales in reading, maths, & science	509.8	15	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	40.2	44	
2.2.1	Tertiary enrolment, % gross	70.8	24	
2.2.2	Graduates in science & engineering, %	16.4	72	○
2.2.3	Tertiary inbound mobility, %	9.0	18	
2.3	Research & development (R&D)	56.8	17	
2.3.1	Researchers, FTE/mn pop.	4,020.8	21	
2.3.2	Gross expenditure on R&D, % GDP	2.4	13	
2.3.3	QS university ranking, average score top 3*	66.3	15	
3	**Infrastructure**	**52.5**	**28**	
3.1	Information & communication technologies (ICTs)	68.7	29	
3.1.1	ICT access*	82.6	18	
3.1.2	ICT use*	61.8	25	
3.1.3	Government's online service*	67.7	31	
3.1.4	E-participation*	62.7	40	
3.2	General infrastructure	46.8	25	
3.2.1	Electricity output, kWh/cap	7,430.5	28	
3.2.2	Logistics performance*	96.1	3	●
3.2.3	Gross capital formation, % GDP	20.3	82	○
3.3	Ecological sustainability	41.9	51	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.5	80	○
3.3.2	Environmental performance*	66.6	36	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.5	42	
4	**Market sophistication**	**54.9**	**35**	
4.1	Credit	36.8	50	
4.1.1	Ease of getting credit*	45.0	80	○
4.1.2	Domestic credit to private sector, % GDP	89.4	36	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	37.5	61	
4.2.1	Ease of protecting investors*	61.7	38	
4.2.2	Market capitalization, % GDP	60.1	31	
4.2.3	Total value of stocks traded, % GDP	20.7	29	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	28	
4.3	Trade & competition	90.4	6	●
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	84.1	5	●
5	**Business sophistication**	**51.0**	**14**	●
5.1	Knowledge workers	68.9	8	●
5.1.1	Knowledge-intensive employment, %	44.4	12	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	1.6	12	
5.1.4	GERD financed by business, %	60.2	12	
5.1.5	Females employed w/advanced degrees, % total	23.2	12	
5.2	Innovation linkages	43.4	27	
5.2.1	University/industry research collaboration†	76.3	6	●
5.2.2	State of cluster development†	61.6	20	
5.2.3	GERD financed by abroad, %	13.0	36	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	40	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.8	18	
5.3	Knowledge absorption	40.8	39	
5.3.1	Royalty & license fees payments, % total trade	0.7	45	
5.3.2	High-tech imports less re-imports, % total trade	9.6	38	
5.3.3	Comm., computer & info. services imp., % total trade	2.0	18	
5.3.4	FDI net inflows, % GDP	(0.6)	133	○
6	**Knowledge & technology outputs**	**36.1**	**36**	
6.1	Knowledge creation	39.0	22	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.5	57	
6.1.2	PCT resident patent app./bn PPP$ GDP	2.5	18	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	40.5	15	
6.1.5	Citable documents H index	502.0	13	●
6.2	Knowledge impact	41.9	50	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.0	98	○
6.2.2	New businesses/th pop. 15–64	2.5	42	
6.2.3	Computer software spending, % GDP	0.7	6	●
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	8.1	45	
6.2.5	High- & medium-high-tech manufactures, %	35.0	29	
6.3	Knowledge diffusion	27.3	70	
6.3.1	Royalty & license fees receipts, % total trade	0.8	18	
6.3.2	High-tech exports less re-exports, % total trade	10.0	21	
6.3.3	Comm., computer & info. services exp., % total trade	2.7	24	
6.3.4	FDI net outflows, % GDP	(4.9)	123	○
7	**Creative outputs**	**50.4**	**20**	
7.1	Intangible assets	50.8	43	
7.1.1	Domestic res trademark app./bn PPP$ GDP	45.5	57	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.6	18	
7.1.3	ICTs & business model creation†	68.0	23	
7.1.4	ICTs & organizational model creation†	66.2	23	
7.2	Creative goods & services	39.4	19	
7.2.1	Cultural & creative services exports, % total trade	1.4	5	●
7.2.2	National feature films/mn pop. 15–69	9.0	19	
7.2.3	Global ent. & media output/th pop. 15–69	46.2	15	
7.2.4	Printing & publishing output manufactures, %	1.4	54	○
7.2.5	Creative goods exports, % total trade	1.8	23	
7.3	Online creativity	60.4	16	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	25.8	26	
7.3.2	Country-code TLDs/th pop. 15–69	80.7	11	●
7.3.3	Wikipedia edits/pop. 15–69	6,650.7	17	
7.3.4	Video uploads on YouTube/pop. 15–69	86.0	23	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Bhutan

Key indicators

Population (millions)	0.8
GDP (US$ billions)	2.1
GDP per capita, PPP$	6,864.3
Income group	Lower-middle income
Region	Central and Southern Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**26.1**	**121**	
Innovation Output Sub-Index		12.9	135	○
Innovation Input Sub-Index		39.2	82	
Innovation Efficiency Ratio		0.3	138	○
Global Innovation Index 2014 (out of 143)		31.8	86	
1	**Institutions**	**62.7**	**63**	●
1.1	Political environment	67.5	44	●
1.1.1	Political stability*	83.9	34	●
1.1.2	Government effectiveness*	51.1	51	●
1.2	Regulatory environment	67.9	64	●
1.2.1	Regulatory quality*	18.6	133	○
1.2.2	Rule of law*	54.1	55	●
1.2.3	Cost of redundancy dismissal, salary weeks	8.3	19	●
1.3	Business environment	52.9	126	
1.3.1	Ease of starting a business*	85.0	76	
1.3.2	Ease of resolving insolvency*	0.0	139	○
1.3.3	Ease of paying taxes*	73.6	68	●
2	**Human capital & research**	**17.5**	**114**	
2.1	Education	45.0	69	
2.1.1	Expenditure on education, % GDP	5.5	41	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	33.6	13	●
2.1.3	School life expectancy, years	12.6	83	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	19.9	83	
2.2	Tertiary education	7.4	129	
2.2.1	Tertiary enrolment, % gross	9.4	114	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**41.8**	**61**	●
3.1	Information & communication technologies (ICTs)	27.1	109	
3.1.1	ICT access*	31.8	113	
3.1.2	ICT use*	16.7	97	
3.1.3	Government's online service*	24.4	113	
3.1.4	E-participation*	35.3	88	
3.2	General infrastructure	64.8	4	●
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	6.6	125	○
3.2.3	Gross capital formation, % GDP	51.5	2	●
3.3	Ecological sustainability	33.6	85	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	46.9	91	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.9	68	
4	**Market sophistication**	**48.2**	**63**	●
4.1	Credit	45.6	32	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	46.1	72	
4.1.3	Microfinance gross loans, % GDP◴	6.1	5	●
4.2	Investment	50.0	29	
4.2.1	Ease of protecting investors*	50.0	91	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	48.8	138	○
4.3.1	Applied tariff rate, weighted mean, %◴	17.8	137	○
4.3.2	Intensity of local competition†	60.2	102	
5	**Business sophistication**	**25.7**	**121**	
5.1	Knowledge workers	21.9	115	
5.1.1	Knowledge-intensive employment, %	16.5	88	
5.1.2	Firms offering formal training, % firms◴	23.3	83	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	1.1	83	○
5.2	Innovation linkages	38.0	51	●
5.2.1	University/industry research collaboration†	28.1	122	
5.2.2	State of cluster development†	42.9	80	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	17.3	139	○
5.3.1	Royalty & license fees payments, % total trade	0.0	122	○
5.3.2	High-tech imports less re-imports, % total trade	3.3	119	
5.3.3	Comm., computer & info. services imp., % total trade	0.4	103	
5.3.4	FDI net inflows, % GDP	1.1	110	
6	**Knowledge & technology outputs**	**2.6**	**141**	○
6.1	Knowledge creation	5.2	102	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.6	74	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	7.3	79	
6.1.5	Citable documents H index	20.0	140	○
6.2	Knowledge impact	2.4	138	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	0.2	97	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.7	100	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	0.3	138	○
6.3.1	Royalty & license fees receipts, % total trade	0.0	105	
6.3.2	High-tech exports less re-exports, % total trade	0.0	124	○
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**23.3**	**107**	
7.1	Intangible assets	29.0	130	
7.1.1	Domestic res trademark app./bn PPP$ GDP	2.9	102	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	45.4	111	
7.1.4	ICTs & organizational model creation†	41.4	112	
7.2	Creative goods & services	33.6	32	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69◴	58.5	1	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade◴	0.0	120	
7.3	Online creativity	1.5	111	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.4	82	
7.3.2	Country-code TLDs/th pop. 15–69	0.9	87	
7.3.3	Wikipedia edits/pop. 15–69	178.9	109	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Bolivia, Plurinational State of

Key indicators

Population (millions)	10.8
GDP (US$ billions)	34.4
GDP per capita, PPP$	5,616.5
Income group	Lower-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**28.6**	**104**	
Innovation Output Sub-Index		24.7	92	
Innovation Input Sub-Index		32.5	118	
Innovation Efficiency Ratio		0.8	45	●
Global Innovation Index 2014 (out of 143)		27.8	111	
1	**Institutions**	**30.9**	**139**	○
1.1	Political environment	43.1	87	
1.1.1	Political stability*	55.6	84	
1.1.2	Government effectiveness*	30.6	91	
1.2	Regulatory environment	11.5	139	○
1.2.1	Regulatory quality*	26.8	121	○
1.2.2	Rule of law*	19.1	128	○
1.2.3	Cost of redundancy dismissal, salary weeks◴	82.3	138	○
1.3	Business environment	38.0	140	○
1.3.1	Ease of starting a business*	59.1	134	○
1.3.2	Ease of resolving insolvency*	42.8	90	
1.3.3	Ease of paying taxes*	12.2	141	○
2	**Human capital & research**	**26.0**	**84**	
2.1	Education	44.2	71	
2.1.1	Expenditure on education, % GDP	6.4	23	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	20.3	56	●
2.1.3	School life expectancy, years◴	13.2	76	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	18.2	79	
2.2	Tertiary education	31.8	71	
2.2.1	Tertiary enrolment, % gross◴	37.7	68	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	1.8	105	
2.3.1	Researchers, FTE/mn pop.◴	162.1	72	
2.3.2	Gross expenditure on R&D, % GDP◴	0.2	96	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**28.7**	**104**	
3.1	Information & communication technologies (ICTs)	35.1	94	
3.1.1	ICT access*	41.1	98	
3.1.2	ICT use*	18.6	92	
3.1.3	Government's online service*	39.4	82	
3.1.4	E-participation*	41.2	79	
3.2	General infrastructure	18.7	124	○
3.2.1	Electricity output, kWh/cap	729.6	99	
3.2.2	Logistics performance*	16.3	111	
3.2.3	Gross capital formation, % GDP	20.8	76	
3.3	Ecological sustainability	32.3	89	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.2	86	
3.3.2	Environmental performance*	50.5	78	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.8	71	
4	**Market sophistication**	**46.4**	**73**	
4.1	Credit	49.8	24	●
4.1.1	Ease of getting credit*	35.0	102	
4.1.2	Domestic credit to private sector, % GDP	47.0	70	
4.1.3	Microfinance gross loans, % GDP	14.7	1	●
4.2	Investment	22.9	133	○
4.2.1	Ease of protecting investors*	40.8	128	○
4.2.2	Market capitalization, % GDP	16.4	78	
4.2.3	Total value of stocks traded, % GDP	0.1	102	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	66.6	108	
4.3.1	Applied tariff rate, weighted mean, %	3.7	61	●
4.3.2	Intensity of local competition†	46.0	130	○
5	**Business sophistication**	**30.5**	**92**	
5.1	Knowledge workers	39.6	66	●
5.1.1	Knowledge-intensive employment, %◴	15.3	92	
5.1.2	Firms offering formal training, % firms◴	57.1	14	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %◴	5.2	73	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	22.3	115	
5.2.1	University/industry research collaboration†	42.3	70	
5.2.2	State of cluster development†	41.0	91	
5.2.3	GERD financed by abroad, %◴	1.9	81	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	70	
5.3	Knowledge absorption	29.5	94	
5.3.1	Royalty & license fees payments, % total trade◴	0.4	64	
5.3.2	High-tech imports less re-imports, % total trade	7.9	55	●
5.3.3	Comm., computer & info. services imp., % total trade◴	0.6	83	
5.3.4	FDI net inflows, % GDP	5.7	27	●
6	**Knowledge & technology outputs**	**20.0**	**102**	
6.1	Knowledge creation	5.4	100	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	3.2	113	
6.1.5	Citable documents H index	71.0	94	
6.2	Knowledge impact	34.3	88	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.1	28	●
6.2.2	New businesses/th pop. 15–64	0.6	84	
6.2.3	Computer software spending, % GDP	0.2	63	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.3	75	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	20.3	111	
6.3.1	Royalty & license fees receipts, % total trade◴	0.1	62	
6.3.2	High-tech exports less re-exports, % total trade	0.4	82	
6.3.3	Comm., computer & info. services exp., % total trade◴	1.0	77	
6.3.4	FDI net outflows, % GDP◴	0.0	105	○
7	**Creative outputs**	**29.4**	**84**	
7.1	Intangible assets	47.4	60	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	47.7	99	
7.1.4	ICTs & organizational model creation†	47.2	92	
7.2	Creative goods & services	20.3	66	●
7.2.1	Cultural & creative services exports, % total trade	0.2	48	
7.2.2	National feature films/mn pop. 15–69◴	4.1	42	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	1.1	38	●
7.3	Online creativity	2.4	105	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.1	87	
7.3.2	Country-code TLDs/th pop. 15–69	0.6	95	
7.3.3	Wikipedia edits/pop. 15–69	590.5	90	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Bosnia and Herzegovina

Key indicators

Population (millions)	3.8
GDP (US$ billions)	18.0
GDP per capita, PPP$	8,589.8
Income group	Upper-middle income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**32.3**	**79**	
Innovation Output Sub-Index		18.2	122	○
Innovation Input Sub-Index		46.4	47	
Innovation Efficiency Ratio		0.4	135	○
Global Innovation Index 2014 (out of 143)		32.4	81	
1	**Institutions**	**59.6**	**71**	
1.1	Political environment	42.1	92	
1.1.1	Political stability*	55.1	85	
1.1.2	Government effectiveness*	29.2	94	
1.2	Regulatory environment	71.0	50	
1.2.1	Regulatory quality*	45.6	76	
1.2.2	Rule of law*	43.2	68	
1.2.3	Cost of redundancy dismissal, salary weeks	9.2	28	●
1.3	Business environment	65.6	81	
1.3.1	Ease of starting a business*	72.5	118	○
1.3.2	Ease of resolving insolvency*	66.2	32	●
1.3.3	Ease of paying taxes*	58.2	116	○
2	**Human capital & research**	**39.9**	**38**	
2.1	Education	89.6	1	
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	n/a	n/a	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	11.1	33	●
2.2	Tertiary education	27.6	81	
2.2.1	Tertiary enrolment, % gross	n/a	n/a	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	6.5	26	●
2.3	Research & development (R&D)	2.6	99	
2.3.1	Researchers, FTE/mn pop. ◴	150.6	77	
2.3.2	Gross expenditure on R&D, % GDP ◴	0.3	80	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**30.9**	**96**	
3.1	Information & communication technologies (ICTs)	36.3	92	
3.1.1	ICT access*	56.3	69	
3.1.2	ICT use*	37.1	59	
3.1.3	Government's online service*	28.3	110	
3.1.4	E-participation*	23.5	115	○
3.2	General infrastructure	24.9	100	
3.2.1	Electricity output, kWh/cap	3,676.8	53	
3.2.2	Logistics performance*	29.9	78	
3.2.3	Gross capital formation, % GDP	19.8	88	
3.3	Ecological sustainability	31.4	92	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.2	106	○
3.3.2	Environmental performance*	45.8	92	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	3.8	25	●
4	**Market sophistication**	**61.6**	**18**	
4.1	Credit	35.4	54	
4.1.1	Ease of getting credit*	65.0	34	
4.1.2	Domestic credit to private sector, % GDP	62.0	54	
4.1.3	Microfinance gross loans, % GDP	1.8	28	
4.2	Investment	54.2	17	
4.2.1	Ease of protecting investors*	54.2	75	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	95.3	1	●
4.3.1	Applied tariff rate, weighted mean, %	1.4	39	●
4.3.2	Intensity of local competition†	n/a	n/a	
5	**Business sophistication**	**40.1**	**41**	
5.1	Knowledge workers	33.6	84	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms	52.1	21	●
5.1.3	GERD performed by business, % of GDP ◴	0.2	53	
5.1.4	GERD financed by business, % ◴	1.2	84	○
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	62.2	3	
5.2.1	University/industry research collaboration†	n/a	n/a	
5.2.2	State of cluster development†	n/a	n/a	
5.2.3	GERD financed by abroad, % ◴	48.7	7	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	24.5	119	○
5.3.1	Royalty & license fees payments, % total trade	0.1	106	○
5.3.2	High-tech imports less re-imports, % total trade	5.4	92	
5.3.3	Comm., computer & info. services imp., % total trade	0.8	65	
5.3.4	FDI net inflows, % GDP	1.8	91	
6	**Knowledge & technology outputs**	**23.0**	**89**	
6.1	Knowledge creation	5.0	105	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.2	90	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	59	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	9.1	70	
6.1.5	Citable documents H index	49.0	117	○
6.2	Knowledge impact	38.7	63	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.3	90	
6.2.2	New businesses/th pop. 15–64	0.7	80	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	21.3	18	●
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	25.2	86	
6.3.1	Royalty & license fees receipts, % total trade	0.2	39	
6.3.2	High-tech exports less re-exports, % total trade	0.9	66	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	0.1	88	
7	**Creative outputs**	**13.4**	**135**	○
7.1	Intangible assets	9.9	137	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	17.9	88	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.5	41	
7.1.3	ICTs & business model creation†	n/a	n/a	
7.1.4	ICTs & organizational model creation†	n/a	n/a	
7.2	Creative goods & services	6.9	112	
7.2.1	Cultural & creative services exports, % total trade	0.0	73	○
7.2.2	National feature films/mn pop. 15–69	3.9	43	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.2	79	
7.3	Online creativity	26.9	49	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.8	75	
7.3.2	Country-code TLDs/th pop. 15–69	2.5	68	
7.3.3	Wikipedia edits/pop. 15–69	3,913.2	34	●
7.3.4	Video uploads on YouTube/pop. 15–69	73.4	51	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Botswana

Key indicators

Population (millions)	2.0
GDP (US$ billions)	15.8
GDP per capita, PPP$	17,106.3
Income group	Upper-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**30.5**	**90**	
Innovation Output Sub-Index		21.3	108	
Innovation Input Sub-Index		39.6	79	
Innovation Efficiency Ratio		0.5	120	
Global Innovation Index 2014 (out of 143)		30.9	92	
1	**Institutions**	**69.0**	**48**	
1.1	Political environment	69.6	40	●
1.1.1	Political stability*	90.3	14	●
1.1.2	Government effectiveness*	48.9	56	
1.2	Regulatory environment	68.6	60	
1.2.1	Regulatory quality*	65.3	41	●
1.2.2	Rule of law*	63.4	39	●
1.2.3	Cost of redundancy dismissal, salary weeks	21.7	100	
1.3	Business environment	68.8	70	
1.3.1	Ease of starting a business*	71.7	119	
1.3.2	Ease of resolving insolvency*	57.2	47	●
1.3.3	Ease of paying taxes*	77.5	55	
2	**Human capital & research**	**23.4**	**93**	
2.1	Education	56.0	24	●
2.1.1	Expenditure on education, % GDP◴	9.5	2	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	33.0	17	●
2.1.3	School life expectancy, years◴	12.5	85	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	13.9	52	
2.2	Tertiary education	8.1	126	○
2.2.1	Tertiary enrolment, % gross◴	17.9	94	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %◴	0.4	100	
2.3	Research & development (R&D)	6.2	76	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP◴	0.5	59	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**34.8**	**86**	
3.1	Information & communication technologies (ICTs)	33.2	98	
3.1.1	ICT access*	40.6	99	
3.1.2	ICT use*	30.3	69	
3.1.3	Government's online service*	30.7	101	
3.1.4	E-participation*	31.4	101	
3.2	General infrastructure	30.1	72	
3.2.1	Electricity output, kWh/cap	125.0	119	○
3.2.2	Logistics performance*	16.9	110	
3.2.3	Gross capital formation, % GDP	31.9	16	●
3.3	Ecological sustainability	41.0	54	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	11.9	15	●
3.3.2	Environmental performance*	47.6	89	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	103	
4	**Market sophistication**	**43.9**	**91**	
4.1	Credit	32.1	62	
4.1.1	Ease of getting credit*	55.0	56	
4.1.2	Domestic credit to private sector, % GDP	32.0	94	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	29.6	98	
4.2.1	Ease of protecting investors*	49.2	93	
4.2.2	Market capitalization, % GDP	31.6	55	
4.2.3	Total value of stocks traded, % GDP	0.8	72	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	70.0	96	
4.3.1	Applied tariff rate, weighted mean, %	6.4	93	
4.3.2	Intensity of local competition†	62.4	92	
5	**Business sophistication**	**27.0**	**112**	
5.1	Knowledge workers	36.0	77	
5.1.1	Knowledge-intensive employment, %◴	17.9	81	
5.1.2	Firms offering formal training, % firms◴	51.9	22	●
5.1.3	GERD performed by business, % of GDP◴	0.1	62	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total◴	9.2	65	
5.2	Innovation linkages	27.1	91	
5.2.1	University/industry research collaboration†	35.7	102	
5.2.2	State of cluster development†	38.7	101	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	37	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	108	○
5.3	Knowledge absorption	17.9	138	○
5.3.1	Royalty & license fees payments, % total trade◴	0.2	91	
5.3.2	High-tech imports less re-imports, % total trade	3.2	121	○
5.3.3	Comm., computer & info. services imp., % total trade◴	0.4	104	
5.3.4	FDI net inflows, % GDP	1.3	103	
6	**Knowledge & technology outputs**	**20.0**	**104**	
6.1	Knowledge creation	4.3	110	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.3	87	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP◴	0.1	52	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	7.7	76	
6.1.5	Citable documents H index	63.0	101	
6.2	Knowledge impact	41.2	52	
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	12.3	7	●
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.4	133	○
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	14.4	129	○
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	106	○
6.3.2	High-tech exports less re-exports, % total trade	0.3	86	
6.3.3	Comm., computer & info. services exp., % total trade◴	0.1	118	○
6.3.4	FDI net outflows, % GDP	(0.0)	108	○
7	**Creative outputs**	**22.7**	**110**	
7.1	Intangible assets	41.5	89	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	44.2	114	
7.1.4	ICTs & organizational model creation†	38.8	121	○
7.2	Creative goods & services	6.1	114	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.2	77	
7.3	Online creativity	1.8	109	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.5	98	
7.3.2	Country-code TLDs/th pop. 15–69	2.2	70	
7.3.3	Wikipedia edits/pop. 15–69	240.5	105	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Brazil

Key indicators

Population (millions)	202.0
GDP (US$ billions)	2,353.0
GDP per capita, PPP$	12,525.7
Income group	Upper-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**34.9**	**70**	
Innovation Output Sub-Index		27.5	74	
Innovation Input Sub-Index		42.4	65	
Innovation Efficiency Ratio		0.6	99	
Global Innovation Index 2014 (out of 143)		36.3	61	
1	**Institutions**	**55.8**	**85**	
1.1	Political environment	48.3	75	
1.1.1	Political stability*	57.3	83	
1.1.2	Government effectiveness*	39.3	75	
1.2	Regulatory environment	66.1	73	
1.2.1	Regulatory quality*	49.6	69	
1.2.2	Rule of law*	44.5	64	
1.2.3	Cost of redundancy dismissal, salary weeks	15.4	68	
1.3	Business environment	53.1	124	○
1.3.1	Ease of starting a business*	63.4	131	○
1.3.2	Ease of resolving insolvency*	54.5	53	
1.3.3	Ease of paying taxes*	41.3	134	○
2	**Human capital & research**	**30.1**	**63**	
2.1	Education	43.7	73	
2.1.1	Expenditure on education, % GDP◴	5.8	33	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	21.6	49	
2.1.3	School life expectancy, years◴	14.2	55	
2.1.4	PISA scales in reading, maths, & science	402.1	53	○
2.1.5	Pupil-teacher ratio, secondary	16.0	69	
2.2	Tertiary education	16.0	111	○
2.2.1	Tertiary enrolment, % gross◴	25.5	83	
2.2.2	Graduates in science & engineering, %	12.0	94	○
2.2.3	Tertiary inbound mobility, %	0.2	104	○
2.3	Research & development (R&D)	30.5	33	●
2.3.1	Researchers, FTE/mn pop.◴	710.3	55	
2.3.2	Gross expenditure on R&D, % GDP◴	1.2	30	●
2.3.3	QS university ranking, average score top 3*	54.0	23	●
3	**Infrastructure**	**40.1**	**67**	
3.1	Information & communication technologies (ICTs)	58.0	43	
3.1.1	ICT access*	61.4	64	
3.1.2	ICT use*	40.1	56	
3.1.3	Government's online service*	59.8	49	
3.1.4	E-participation*	70.6	24	●
3.2	General infrastructure	23.2	109	○
3.2.1	Electricity output, kWh/cap	2,781.0	65	
3.2.2	Logistics performance*	39.9	63	
3.2.3	Gross capital formation, % GDP	17.0	116	○
3.3	Ecological sustainability	39.1	63	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.0	41	
3.3.2	Environmental performance*	53.0	69	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.2	61	
4	**Market sophistication**	**44.3**	**87**	
4.1	Credit	22.7	102	
4.1.1	Ease of getting credit*	45.0	80	
4.1.2	Domestic credit to private sector, % GDP	70.7	47	
4.1.3	Microfinance gross loans, % GDP	0.1	69	
4.2	Investment	38.2	60	
4.2.1	Ease of protecting investors*	62.5	34	
4.2.2	Market capitalization, % GDP	54.7	35	
4.2.3	Total value of stocks traded, % GDP	37.1	21	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	52	
4.3	Trade & competition	72.0	89	
4.3.1	Applied tariff rate, weighted mean, %	7.7	106	
4.3.2	Intensity of local competition†	71.2	50	
5	**Business sophistication**	**41.6**	**37**	
5.1	Knowledge workers	42.2	54	
5.1.1	Knowledge-intensive employment, %	21.0	69	
5.1.2	Firms offering formal training, % firms◴	42.2	41	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %◴	43.1	33	
5.1.5	Females employed w/advanced degrees, % total◴	8.3	67	○
5.2	Innovation linkages	35.8	59	
5.2.1	University/industry research collaboration†	46.7	52	
5.2.2	State of cluster development†	60.4	22	●
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	75	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	63	
5.3	Knowledge absorption	46.7	21	●
5.3.1	Royalty & license fees payments, % total trade	1.2	21	●
5.3.2	High-tech imports less re-imports, % total trade	12.0	23	●
5.3.3	Comm., computer & info. services imp., % total trade	1.7	29	●
5.3.4	FDI net inflows, % GDP	3.6	46	
6	**Knowledge & technology outputs**	**25.4**	**72**	
6.1	Knowledge creation	15.9	56	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.5	55	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.2	51	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.9	29	
6.1.4	Scientific & technical articles/bn PPP$ GDP	11.8	63	
6.1.5	Citable documents H index	342.0	22	●
6.2	Knowledge impact	36.5	74	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.8	80	
6.2.2	New businesses/th pop. 15–64	2.2	45	
6.2.3	Computer software spending, % GDP	0.3	49	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	6.9	51	
6.2.5	High- & medium-high-tech manufactures, %	39.8	22	●
6.3	Knowledge diffusion	23.9	93	
6.3.1	Royalty & license fees receipts, % total trade	0.2	38	
6.3.2	High-tech exports less re-exports, % total trade	3.0	44	
6.3.3	Comm., computer & info. services exp., % total trade	0.3	109	○
6.3.4	FDI net outflows, % GDP	0.6	64	
7	**Creative outputs**	**29.6**	**82**	
7.1	Intangible assets	42.3	87	
7.1.1	Domestic res trademark app./bn PPP$ GDP	41.2	61	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	54.1	73	
7.1.4	ICTs & organizational model creation†	50.8	74	
7.2	Creative goods & services	9.8	96	
7.2.1	Cultural & creative services exports, % total trade	0.3	45	
7.2.2	National feature films/mn pop. 15–69	0.9	79	
7.2.3	Global ent. & media output/th pop. 15–69	9.3	36	
7.2.4	Printing & publishing output manufactures, %	0.9	77	○
7.2.5	Creative goods exports, % total trade	0.2	76	
7.3	Online creativity	23.9	55	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.9	90	
7.3.2	Country-code TLDs/th pop. 15–69	10.3	43	
7.3.3	Wikipedia edits/pop. 15–69	971.2	76	
7.3.4	Video uploads on YouTube/pop. 15–69	76.2	43	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Bulgaria

Key indicators

Population (millions)	7.2
GDP (US$ billions)	55.8
GDP per capita, PPP$	15,031.3
Income group	Upper-middle income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**42.2**	**39**	
Innovation Output Sub-Index		38.2	35	
Innovation Input Sub-Index		46.1	49	
Innovation Efficiency Ratio		0.8	21	●
Global Innovation Index 2014 (out of 143)		40.7	44	
1	**Institutions**	**69.7**	**45**	
1.1	Political environment	57.0	54	
1.1.1	Political stability*	68.5	56	
1.1.2	Government effectiveness*	45.5	61	
1.2	Regulatory environment	75.8	39	
1.2.1	Regulatory quality*	61.6	49	
1.2.2	Rule of law*	44.0	66	
1.2.3	Cost of redundancy dismissal, salary weeks	8.6	20	●
1.3	Business environment	76.3	40	
1.3.1	Ease of starting a business*	91.1	42	
1.3.2	Ease of resolving insolvency*	64.8	36	
1.3.3	Ease of paying taxes*	73.2	71	
2	**Human capital & research**	**32.2**	**58**	
2.1	Education	43.6	74	
2.1.1	Expenditure on education, % GDP	3.8	89	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	22.2	48	
2.1.3	School life expectancy, years	14.4	52	
2.1.4	PISA scales in reading, maths, & science	440.4	42	
2.1.5	Pupil-teacher ratio, secondary	12.3	43	
2.2	Tertiary education	38.7	50	
2.2.1	Tertiary enrolment, % gross	62.7	33	
2.2.2	Graduates in science & engineering, %	21.5	43	
2.2.3	Tertiary inbound mobility, %	3.9	46	
2.3	Research & development (R&D)	14.4	57	
2.3.1	Researchers, FTE/mn pop.	1,699.3	39	
2.3.2	Gross expenditure on R&D, % GDP	0.7	52	
2.3.3	QS university ranking, average score top 3*	7.3	65	
3	**Infrastructure**	**43.3**	**53**	
3.1	Information & communication technologies (ICTs)	41.1	81	
3.1.1	ICT access*	67.7	50	
3.1.2	ICT use*	47.7	41	
3.1.3	Government's online service*	23.6	117	○
3.1.4	E-participation*	25.5	110	○
3.2	General infrastructure	37.5	50	
3.2.1	Electricity output, kWh/cap	6,372.0	30	
3.2.2	Logistics performance*	50.8	45	
3.2.3	Gross capital formation, % GDP	23.5	54	
3.3	Ecological sustainability	51.2	26	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.9	99	○
3.3.2	Environmental performance*	64.0	40	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	11.0	5	●
4	**Market sophistication**	**48.9**	**61**	
4.1	Credit	36.1	52	
4.1.1	Ease of getting credit*	70.0	22	
4.1.2	Domestic credit to private sector, % GDP	69.6	50	
4.1.3	Microfinance gross loans, % GDP	1.4	34	
4.2	Investment	29.1	101	○
4.2.1	Ease of protecting investors*	68.3	14	●
4.2.2	Market capitalization, % GDP	12.7	81	○
4.2.3	Total value of stocks traded, % GDP	0.7	74	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	63	○
4.3	Trade & competition	81.3	45	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	66.1	72	
5	**Business sophistication**	**36.4**	**60**	
5.1	Knowledge workers	42.8	50	
5.1.1	Knowledge-intensive employment, %	31.0	45	
5.1.2	Firms offering formal training, % firms	42.8	39	
5.1.3	GERD performed by business, % of GDP	0.4	38	
5.1.4	GERD financed by business, %	19.4	62	○
5.1.5	Females employed w/advanced degrees, % total	18.5	26	
5.2	Innovation linkages	38.6	48	
5.2.1	University/industry research collaboration†	33.3	110	○
5.2.2	State of cluster development†	32.6	123	○
5.2.3	GERD financed by abroad, %	48.3	8	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.1	54	
5.3	Knowledge absorption	27.8	102	○
5.3.1	Royalty & license fees payments, % total trade	0.5	52	
5.3.2	High-tech imports less re-imports, % total trade	6.3	75	
5.3.3	Comm., computer & info. services imp., % total trade	0.7	76	
5.3.4	FDI net inflows, % GDP	3.6	48	
6	**Knowledge & technology outputs**	**35.4**	**37**	
6.1	Knowledge creation	25.6	37	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.3	45	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.4	43	
6.1.3	Domestic res utility model app./bn PPP$ GDP	2.9	11	●
6.1.4	Scientific & technical articles/bn PPP$ GDP	16.1	48	
6.1.5	Citable documents H index	154.0	45	
6.2	Knowledge impact	51.3	18	●
6.2.1	Growth rate of PPP$ GDP/worker, %	0.7	83	○
6.2.2	New businesses/th pop. 15–64	9.0	12	●
6.2.3	Computer software spending, % GDP	0.3	40	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	43.1	3	●
6.2.5	High- & medium-high-tech manufactures, %	18.9	60	
6.3	Knowledge diffusion	29.2	62	
6.3.1	Royalty & license fees receipts, % total trade	0.1	63	
6.3.2	High-tech exports less re-exports, % total trade	3.1	42	
6.3.3	Comm., computer & info. services exp., % total trade	2.1	38	
6.3.4	FDI net outflows, % GDP	1.2	49	
7	**Creative outputs**	**41.1**	**34**	
7.1	Intangible assets	53.5	33	
7.1.1	Domestic res trademark app./bn PPP$ GDP	111.5	9	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	2.2	11	●
7.1.3	ICTs & business model creation†	51.0	89	
7.1.4	ICTs & organizational model creation†	48.0	88	
7.2	Creative goods & services	22.3	59	
7.2.1	Cultural & creative services exports, % total trade	0.8	25	
7.2.2	National feature films/mn pop. 15–69	2.8	53	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	1.2	64	
7.2.5	Creative goods exports, % total trade	0.8	43	
7.3	Online creativity	35.1	38	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	24.8	28	●
7.3.2	Country-code TLDs/th pop. 15–69	2.8	65	
7.3.3	Wikipedia edits/pop. 15–69	4,772.6	28	●
7.3.4	Video uploads on YouTube/pop. 15–69	77.4	41	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Burkina Faso

Key indicators

Population (millions)	17.4
GDP (US$ billions)	12.5
GDP per capita, PPP$	1,666.6
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**28.7**	**102**	
Innovation Output Sub-Index		23.2	100	
Innovation Input Sub-Index		34.2	109	
Innovation Efficiency Ratio		0.7	85	
Global Innovation Index 2014 (out of 143)		28.2	109	
1	**Institutions**	**52.3**	**97**	
1.1	Political environment	35.1	110	
1.1.1	Political stability*	45.5	109	
1.1.2	Government effectiveness*	24.7	107	
1.2	Regulatory environment	66.8	69	●
1.2.1	Regulatory quality*	43.4	83	
1.2.2	Rule of law*	33.6	92	
1.2.3	Cost of redundancy dismissal, salary weeks	10.4	38	●
1.3	Business environment	55.1	116	
1.3.1	Ease of starting a business*	69.1	121	
1.3.2	Ease of resolving insolvency*	38.1	105	
1.3.3	Ease of paying taxes*	58.1	117	
2	**Human capital & research**	**15.7**	**119**	
2.1	Education	22.2	131	○
2.1.1	Expenditure on education, % GDP	3.4	100	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	16.6	75	
2.1.3	School life expectancy, years	7.8	129	○
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	26.9	100	
2.2	Tertiary education	23.3	94	
2.2.1	Tertiary enrolment, % gross	4.8	125	○
2.2.2	Graduates in science & engineering, %	19.9	57	
2.2.3	Tertiary inbound mobility, %	2.9	54	●
2.3	Research & development (R&D)	1.7	109	
2.3.1	Researchers, FTE/mn pop. ◴	47.8	91	
2.3.2	Gross expenditure on R&D, % GDP ◴	0.2	89	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**22.6**	**127**	
3.1	Information & communication technologies (ICTs)	18.2	125	
3.1.1	ICT access*	24.6	127	○
3.1.2	ICT use*	4.5	124	
3.1.3	Government's online service*	29.9	106	
3.1.4	E-participation*	13.7	129	○
3.2	General infrastructure	22.4	111	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	24.3	93	
3.2.3	Gross capital formation, % GDP	18.0	109	
3.3	Ecological sustainability	27.3	110	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	40.5	106	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	126	
4	**Market sophistication**	**42.9**	**97**	
4.1	Credit	17.9	119	
4.1.1	Ease of getting credit*	30.0	113	
4.1.2	Domestic credit to private sector, % GDP	26.1	106	
4.1.3	Microfinance gross loans, % GDP	1.4	33	●
4.2	Investment	45.8	37	
4.2.1	Ease of protecting investors*	45.8	107	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	65.1	118	
4.3.1	Applied tariff rate, weighted mean, %	8.4	110	
4.3.2	Intensity of local competition†	59.4	106	
5	**Business sophistication**	**37.4**	**52**	●
5.1	Knowledge workers	24.0	108	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms ◴	24.8	78	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, % ◴	11.9	68	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	50.4	14	
5.2.1	University/industry research collaboration†	36.1	100	
5.2.2	State of cluster development†	31.6	126	○
5.2.3	GERD financed by abroad, % ◴	59.6	2	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	37.7	48	●
5.3.1	Royalty & license fees payments, % total trade ◴	0.0	120	○
5.3.2	High-tech imports less re-imports, % total trade	4.5	107	
5.3.3	Comm., computer & info. services imp., % total trade ◴	2.5	8	●
5.3.4	FDI net inflows, % GDP	3.2	57	●
6	**Knowledge & technology outputs**	**21.4**	**99**	
6.1	Knowledge creation	5.1	104	
6.1.1	Domestic resident patent app./bn PPP$ GDP ◴	0.1	101	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP ◴	0.1	50	
6.1.4	Scientific & technical articles/bn PPP$ GDP	10.0	68	●
6.1.5	Citable documents H index	71.0	94	
6.2	Knowledge impact	36.6	71	●
6.2.1	Growth rate of PPP$ GDP/worker, %	2.9	30	●
6.2.2	New businesses/th pop. 15–64	0.1	98	○
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.6	104	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	22.5	101	
6.3.1	Royalty & license fees receipts, % total trade ◴	0.0	87	
6.3.2	High-tech exports less re-exports, % total trade	0.1	110	
6.3.3	Comm., computer & info. services exp., % total trade ◴	2.3	31	●
6.3.4	FDI net outflows, % GDP ◴	0.0	100	
7	**Creative outputs**	**24.9**	**100**	
7.1	Intangible assets	48.4	55	●
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	55.0	71	●
7.1.4	ICTs & organizational model creation†	41.8	110	
7.2	Creative goods & services	2.8	121	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	1.8	59	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade ◴	0.0	112	
7.3	Online creativity	0.1	139	○
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.1	132	○
7.3.2	Country-code TLDs/th pop. 15–69	0.0	129	
7.3.3	Wikipedia edits/pop. 15–69	8.7	138	○
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Burundi

Key indicators

Population (millions)	10.5
GDP (US$ billions)	3.1
GDP per capita, PPP$	666.4
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**21.0**	**136**	
Innovation Output Sub-Index		11.1	138	○
Innovation Input Sub-Index		31.0	122	
Innovation Efficiency Ratio		0.4	137	○
Global Innovation Index 2014 (out of 143)		22.4	138	
1	**Institutions**	**46.4**	**118**	
1.1	Political environment	22.2	132	
1.1.1	Political stability*	32.1	130	
1.1.2	Government effectiveness*	12.3	131	
1.2	Regulatory environment	53.2	106	
1.2.1	Regulatory quality*	24.6	123	
1.2.2	Rule of law*	19.4	127	
1.2.3	Cost of redundancy dismissal, salary weeks	15.9	71	●
1.3	Business environment	63.9	87	●
1.3.1	Ease of starting a business*	94.3	17	●
1.3.2	Ease of resolving insolvency*	30.6	122	
1.3.3	Ease of paying taxes*	66.8	98	
2	**Human capital & research**	**17.3**	**115**	
2.1	Education	35.8	94	
2.1.1	Expenditure on education, % GDP	5.8	34	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	33.0	16	●
2.1.3	School life expectancy, years[d]	10.1	115	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	31.7	110	
2.2	Tertiary education	14.9	113	
2.2.1	Tertiary enrolment, % gross[d]	3.2	130	
2.2.2	Graduates in science & engineering, %[d]	9.6	97	
2.2.3	Tertiary inbound mobility, %[d]	6.2	29	●
2.3	Research & development (R&D)	1.3	111	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP[d]	0.1	103	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**17.7**	**136**	
3.1	Information & communication technologies (ICTs)	3.7	141	○
3.1.1	ICT access*	n/a	n/a	
3.1.2	ICT use*	n/a	n/a	
3.1.3	Government's online service*	1.6	139	○
3.1.4	E-participation*	5.9	139	○
3.2	General infrastructure	23.5	108	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	20.6	100	
3.2.3	Gross capital formation, % GDP	19.6	91	
3.3	Ecological sustainability	25.8	118	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	25.8	135	○
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	n/a	n/a	
4	**Market sophistication**	**42.7**	**99**	
4.1	Credit	13.3	126	
4.1.1	Ease of getting credit*	10.0	133	○
4.1.2	Domestic credit to private sector, % GDP	18.0	118	
4.1.3	Microfinance gross loans, % GDP	2.1	25	●
4.2	Investment	51.7	23	
4.2.1	Ease of protecting investors*	51.7	83	●
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	63.1	121	
4.3.1	Applied tariff rate, weighted mean, %	6.4	94	
4.3.2	Intensity of local competition†	48.6	127	
5	**Business sophistication**	**30.7**	**91**	
5.1	Knowledge workers	24.7	105	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms[d]	22.1	85	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	36.2	54	●
5.2.1	University/industry research collaboration†	29.7	118	
5.2.2	State of cluster development†	28.9	129	
5.2.3	GERD financed by abroad, %[d]	39.9	12	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP[d]	0.2	31	●
5.3	Knowledge absorption	31.2	85	●
5.3.1	Royalty & license fees payments, % total trade[d]	0.0	125	○
5.3.2	High-tech imports less re-imports, % total trade	9.8	33	●
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	0.3	126	
6	**Knowledge & technology outputs**	**7.2**	**139**	○
6.1	Knowledge creation	2.6	133	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.7	118	
6.1.5	Citable documents H index	26.0	136	
6.2	Knowledge impact	1.3	140	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.0	141	○
6.2.5	High- & medium-high-tech manufactures, %[d]	1.8	97	
6.3	Knowledge diffusion	17.7	120	
6.3.1	Royalty & license fees receipts, % total trade[d]	0.0	108	
6.3.2	High-tech exports less re-exports, % total trade	0.2	95	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	0.0	101	
7	**Creative outputs**	**15.1**	**133**	
7.1	Intangible assets	26.4	132	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	29.0	132	○
7.1.4	ICTs & organizational model creation†	23.9	133	○
7.2	Creative goods & services	7.4	107	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %[d]	0.8	81	
7.2.5	Creative goods exports, % total trade[d]	0.1	87	
7.3	Online creativity	0.1	137	○
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.0	136	
7.3.2	Country-code TLDs/th pop. 15–69	0.1	118	
7.3.3	Wikipedia edits/pop. 15–69	7.6	139	○
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[d] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Cabo Verde

Key indicators

Population (millions)	0.5
GDP (US$ billions)	1.9
GDP per capita, PPP$	4,482.6
Income group	Lower-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**28.6**	**103**	
Innovation Output Sub-Index		20.1	114	
Innovation Input Sub-Index		37.1	92	
Innovation Efficiency Ratio		0.5	119	
Global Innovation Index 2014 (out of 143)		30.1	97	
1	**Institutions**	**57.6**	**79**	
1.1	Political environment	64.4	49	●
1.1.1	Political stability*	84.1	33	●
1.1.2	Government effectiveness*	44.8	62	●
1.2	Regulatory environment	55.0	102	
1.2.1	Regulatory quality*	44.6	81	
1.2.2	Rule of law*	60.5	44	●
1.2.3	Cost of redundancy dismissal, salary weeks	29.5	125	
1.3	Business environment	53.4	122	
1.3.1	Ease of starting a business*	87.0	66	●
1.3.2	Ease of resolving insolvency*	0.0	139	○
1.3.3	Ease of paying taxes*	73.1	73	
2	**Human capital & research**	**17.5**	**113**	
2.1	Education	40.4	85	
2.1.1	Expenditure on education, % GDP	5.0	56	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	14.8	87	
2.1.3	School life expectancy, years	13.5	72	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	16.7	74	
2.2	Tertiary education	11.5	122	
2.2.1	Tertiary enrolment, % gross	22.8	87	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	1.0	82	
2.3	Research & development (R&D)	0.7	117	
2.3.1	Researchers, FTE/mn pop.◴	51.0	89	
2.3.2	Gross expenditure on R&D, % GDP◴	0.1	111	○
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**41.0**	**62**	●
3.1	Information & communication technologies (ICTs)	25.2	113	
3.1.1	ICT access*	45.5	88	
3.1.2	ICT use*	29.0	73	
3.1.3	Government's online service*	16.5	125	
3.1.4	E-participation*	9.8	133	○
3.2	General infrastructure	67.7	2	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	n/a	n/a	
3.2.3	Gross capital formation, % GDP	39.4	7	●
3.3	Ecological sustainability	30.2	94	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	44.1	97	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	100	
4	**Market sophistication**	**41.9**	**102**	
4.1	Credit	29.9	76	
4.1.1	Ease of getting credit*	40.0	93	
4.1.2	Domestic credit to private sector, % GDP	63.2	53	●
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	35.0	68	
4.2.1	Ease of protecting investors*	35.0	133	○
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	60.9	127	
4.3.1	Applied tariff rate, weighted mean, %◴	10.2	122	
4.3.2	Intensity of local competition†	57.6	112	
5	**Business sophistication**	**27.6**	**107**	
5.1	Knowledge workers	17.4	127	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	16.6	96	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	38.6	49	
5.2.1	University/industry research collaboration†	36.9	94	
5.2.2	State of cluster development†	39.4	98	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	26.8	107	
5.3.1	Royalty & license fees payments, % total trade	0.0	119	○
5.3.2	High-tech imports less re-imports, % total trade	3.5	118	
5.3.3	Comm., computer & info. services imp., % total trade	1.4	40	●
5.3.4	FDI net inflows, % GDP	2.1	80	
6	**Knowledge & technology outputs**	**12.8**	**129**	
6.1	Knowledge creation	6.0	94	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	8.2	73	
6.1.5	Citable documents H index	13.0	141	○
6.2	Knowledge impact	7.0	129	
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.4	73	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	25.3	85	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	115	○
6.3.2	High-tech exports less re-exports, % total trade	0.0	125	○
6.3.3	Comm., computer & info. services exp., % total trade	2.9	19	●
6.3.4	FDI net outflows, % GDP	0.7	59	●
7	**Creative outputs**	**27.3**	**88**	
7.1	Intangible assets	53.1	35	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	56.4	68	
7.1.4	ICTs & organizational model creation†	49.7	77	
7.2	Creative goods & services	1.1	130	○
7.2.1	Cultural & creative services exports, % total trade	0.0	66	
7.2.2	National feature films/mn pop. 15–69	0.0	104	○
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	2.0	108	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.6	78	
7.3.2	Country-code TLDs/th pop. 15–69	1.0	85	
7.3.3	Wikipedia edits/pop. 15–69	299.8	100	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Cambodia

Key indicators

Population (millions)	15.4
GDP (US$ billions)	16.6
GDP per capita, PPP$	2,777.2
Income group	Low income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**30.4**	**91**	
Innovation Output Sub-Index		24.7	91	
Innovation Input Sub-Index		36.0	96	
Innovation Efficiency Ratio		0.7	80	
Global Innovation Index 2014 (out of 143)		28.7	106	
1	**Institutions**	**48.4**	**108**	
1.1	Political environment	38.4	106	
1.1.1	Political stability*	60.3	77	
1.1.2	Government effectiveness*	16.5	124	
1.2	Regulatory environment	53.7	105	
1.2.1	Regulatory quality*	38.5	98	
1.2.2	Rule of law*	21.3	124	
1.2.3	Cost of redundancy dismissal, salary weeks	19.3	88	
1.3	Business environment	53.1	123	
1.3.1	Ease of starting a business*	41.2	140	○
1.3.2	Ease of resolving insolvency*	45.0	79	
1.3.3	Ease of paying taxes*	73.1	72	●
2	**Human capital & research**	**14.8**	**122**	
2.1	Education	30.2	120	
2.1.1	Expenditure on education, % GDP◴	2.6	116	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years◴	10.9	107	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	28.9	104	
2.2	Tertiary education	14.3	114	
2.2.1	Tertiary enrolment, % gross◴	15.8	99	
2.2.2	Graduates in science & engineering, %◴	12.5	93	○
2.2.3	Tertiary inbound mobility, %◴	0.1	114	○
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**22.7**	**125**	○
3.1	Information & communication technologies (ICTs)	19.9	123	
3.1.1	ICT access*	37.3	106	
3.1.2	ICT use*	5.5	119	
3.1.3	Government's online service*	17.3	122	○
3.1.4	E-participation*	19.6	121	
3.2	General infrastructure	22.0	112	
3.2.1	Electricity output, kWh/cap	96.4	121	○
3.2.2	Logistics performance*	29.6	79	
3.2.3	Gross capital formation, % GDP	21.5	71	●
3.3	Ecological sustainability	26.3	116	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.8	74	
3.3.2	Environmental performance*	35.4	121	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	119	
4	**Market sophistication**	**60.6**	**20**	●
4.1	Credit	64.6	7	●
4.1.1	Ease of getting credit*	80.0	11	●
4.1.2	Domestic credit to private sector, % GDP	45.3	74	
4.1.3	Microfinance gross loans, % GDP	17.3	1	●
4.2	Investment	52.5	21	
4.2.1	Ease of protecting investors*	52.5	82	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	64.7	119	
4.3.1	Applied tariff rate, weighted mean, %◴	9.9	120	
4.3.2	Intensity of local competition†	64.3	83	
5	**Business sophistication**	**33.3**	**74**	
5.1	Knowledge workers	32.6	86	
5.1.1	Knowledge-intensive employment, %◴	4.1	110	○
5.1.2	Firms offering formal training, % firms◴	48.4	31	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	42.8	30	●
5.2.1	University/industry research collaboration†	33.0	112	
5.2.2	State of cluster development†	47.7	61	●
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	24.6	118	
5.3.1	Royalty & license fees payments, % total trade	0.1	97	
5.3.2	High-tech imports less re-imports, % total trade	4.4	108	
5.3.3	Comm., computer & info. services imp., % total trade	0.5	94	
5.3.4	FDI net inflows, % GDP	8.8	13	●
6	**Knowledge & technology outputs**	**26.6**	**68**	●
6.1	Knowledge creation	3.6	119	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.0	112	○
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	4.3	106	
6.1.5	Citable documents H index	57.0	112	
6.2	Knowledge impact	57.4	6	
6.2.1	Growth rate of PPP$ GDP/worker, %	5.0	9	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.4	131	○
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	18.7	114	
6.3.1	Royalty & license fees receipts, % total trade	0.0	82	
6.3.2	High-tech exports less re-exports, % total trade	0.7	70	
6.3.3	Comm., computer & info. services exp., % total trade	0.7	85	
6.3.4	FDI net outflows, % GDP	0.3	76	
7	**Creative outputs**	**22.8**	**108**	
7.1	Intangible assets	39.6	92	
7.1.1	Domestic res trademark app./bn PPP$ GDP	21.0	81	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	53.2	77	
7.1.4	ICTs & organizational model creation†	55.2	58	●
7.2	Creative goods & services	11.3	95	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	2.0	57	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.4	61	●
7.3	Online creativity	0.8	115	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.9	105	
7.3.2	Country-code TLDs/th pop. 15–69	0.1	124	
7.3.3	Wikipedia edits/pop. 15–69	202.6	108	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Cameroon

Key indicators

Population (millions)	22.8
GDP (US$ billions)	31.7
GDP per capita, PPP$	2,514.2
Income group	Lower-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**27.8**	**110**	
Innovation Output Sub-Index		25.4	90	
Innovation Input Sub-Index		30.2	126	
Innovation Efficiency Ratio		0.8	19	●
Global Innovation Index 2014 (out of 143)		27.5	114	
1	**Institutions**	**44.5**	**125**	
1.1	Political environment	34.7	111	
1.1.1	Political stability*	51.4	98	
1.1.2	Government effectiveness*	18.0	121	
1.2	Regulatory environment	49.0	116	
1.2.1	Regulatory quality*	23.1	125	
1.2.2	Rule of law*	19.8	126	
1.2.3	Cost of redundancy dismissal, salary weeks	19.9	91	
1.3	Business environment	49.7	133	○
1.3.1	Ease of starting a business*	76.4	108	
1.3.2	Ease of resolving insolvency*	36.4	109	
1.3.3	Ease of paying taxes*	36.3	137	○
2	**Human capital & research**	**18.0**	**111**	
2.1	Education	29.7	121	
2.1.1	Expenditure on education, % GDP	3.0	109	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	19.7	58	●
2.1.3	School life expectancy, years[d]	10.4	111	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	21.4	89	
2.2	Tertiary education	24.5	88	
2.2.1	Tertiary enrolment, % gross[d]	11.9	107	
2.2.2	Graduates in science & engineering, %[d]	21.0	48	●
2.2.3	Tertiary inbound mobility, %[d]	1.4	76	
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**19.6**	**133**	○
3.1	Information & communication technologies (ICTs)	16.4	131	○
3.1.1	ICT access*	27.5	120	
3.1.2	ICT use*	2.8	127	○
3.1.3	Government's online service*	19.7	121	
3.1.4	E-participation*	15.7	126	
3.2	General infrastructure	15.1	132	○
3.2.1	Electricity output, kWh/cap	290.4	110	
3.2.2	Logistics performance*	6.9	124	○
3.2.3	Gross capital formation, % GDP	20.2	83	
3.3	Ecological sustainability	27.4	109	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.0	65	●
3.3.2	Environmental performance*	36.7	118	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	118	
4	**Market sophistication**	**40.6**	**110**	
4.1	Credit	17.5	121	
4.1.1	Ease of getting credit*	35.0	102	
4.1.2	Domestic credit to private sector, % GDP	14.8	130	○
4.1.3	Microfinance gross loans, % GDP	1.2	35	●
4.2	Investment	46.7	33	
4.2.1	Ease of protecting investors*	46.7	102	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	57.6	132	○
4.3.1	Applied tariff rate, weighted mean, %	12.7	131	○
4.3.2	Intensity of local competition†	59.7	105	
5	**Business sophistication**	**28.2**	**103**	
5.1	Knowledge workers	29.2	95	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms[d]	25.5	76	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	32.1	64	●
5.2.1	University/industry research collaboration†	39.6	79	
5.2.2	State of cluster development†	41.9	84	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP[d]	0.0	73	
5.3	Knowledge absorption	23.4	122	
5.3.1	Royalty & license fees payments, % total trade[d]	0.1	103	
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade[d]	0.5	98	
5.3.4	FDI net inflows, % GDP	2.0	87	
6	**Knowledge & technology outputs**	**18.2**	**114**	
6.1	Knowledge creation	8.0	85	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP[d]	0.0	93	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	11.3	66	●
6.1.5	Citable documents H index	78.0	90	
6.2	Knowledge impact	28.6	110	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.7	54	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.2	73	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.5	124	
6.2.5	High- & medium-high-tech manufactures, %[d]	5.1	90	
6.3	Knowledge diffusion	18.0	119	
6.3.1	Royalty & license fees receipts, % total trade[d]	0.0	102	
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade[d]	1.2	71	
6.3.4	FDI net outflows, % GDP	(1.3)	121	○
7	**Creative outputs**	**32.6**	**68**	●
7.1	Intangible assets	51.1	41	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	53.1	78	●
7.1.4	ICTs & organizational model creation†	49.2	79	
7.2	Creative goods & services	28.0	44	●
7.2.1	Cultural & creative services exports, % total trade	1.2	11	●
7.2.2	National feature films/mn pop. 15–69[d]	1.8	58	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %[d]	1.3	58	●
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	0.3	124	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.2	125	
7.3.2	Country-code TLDs/th pop. 15–69	0.4	104	
7.3.3	Wikipedia edits/pop. 15–69	27.5	130	○
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[d] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Canada

Key indicators

Population (millions)	35.5
GDP (US$ billions)	1,788.7
GDP per capita, PPP$	44,655.7
Income group	High income
Region	Northern America

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**55.7**	**16**	
Innovation Output Sub-Index		46.4	22	
Innovation Input Sub-Index		65.1	9	
Innovation Efficiency Ratio		0.7	70	○
Global Innovation Index 2014 (out of 143)		56.1	12	
1	**Institutions**	**92.7**	**6**	●
1.1	Political environment	89.5	11	
1.1.1	Political stability*	89.6	16	
1.1.2	Government effectiveness*	89.3	7	
1.2	Regulatory environment	94.9	10	
1.2.1	Regulatory quality*	93.5	11	
1.2.2	Rule of law*	93.9	12	
1.2.3	Cost of redundancy dismissal, salary weeks	10.0	34	
1.3	Business environment	93.7	1	●
1.3.1	Ease of starting a business*	98.8	2	●
1.3.2	Ease of resolving insolvency*	89.2	6	●
1.3.3	Ease of paying taxes*	93.0	9	
2	**Human capital & research**	**49.0**	**22**	
2.1	Education	37.5	92	○
2.1.1	Expenditure on education, % GDP	5.3	45	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	18.3	65	○
2.1.3	School life expectancy, years	n/a	n/a	
2.1.4	PISA scales in reading, maths, & science	522.2	8	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	n/a	n/a	
2.2.1	Tertiary enrolment, % gross	n/a	n/a	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	60.4	14	
2.3.1	Researchers, FTE/mn pop.◴	4,493.7	13	
2.3.2	Gross expenditure on R&D, % GDP	1.6	24	
2.3.3	QS university ranking, average score top 3*	88.8	4	●
3	**Infrastructure**	**60.9**	**11**	
3.1	Information & communication technologies (ICTs)	80.0	11	
3.1.1	ICT access*	80.1	22	
3.1.2	ICT use*	66.3	20	
3.1.3	Government's online service*	91.3	10	
3.1.4	E-participation*	82.4	14	
3.2	General infrastructure	62.6	5	●
3.2.1	Electricity output, kWh/cap	18,511.8	5	●
3.2.2	Logistics performance*	86.4	12	
3.2.3	Gross capital formation, % GDP	23.8	51	
3.3	Ecological sustainability	40.1	58	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	5.2	94	○
3.3.2	Environmental performance*	73.1	24	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.2	60	
4	**Market sophistication**	**73.5**	**4**	●
4.1	Credit	62.8	9	
4.1.1	Ease of getting credit*	85.0	7	
4.1.2	Domestic credit to private sector, % GDP◴	124.9	21	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	71.5	5	●
4.2.1	Ease of protecting investors*	72.5	7	
4.2.2	Market capitalization, % GDP	110.7	10	
4.2.3	Total value of stocks traded, % GDP	66.3	12	
4.2.4	Venture capital deals/tr PPP$ GDP	0.7	4	●
4.3	Trade & competition	86.1	20	
4.3.1	Applied tariff rate, weighted mean, %	0.8	5	●
4.3.2	Intensity of local competition†	75.0	31	
5	**Business sophistication**	**49.3**	**18**	
5.1	Knowledge workers	56.0	28	
5.1.1	Knowledge-intensive employment, %	44.2	14	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	0.8	25	
5.1.4	GERD financed by business, %	46.4	25	
5.1.5	Females employed w/advanced degrees, % total	15.6	35	
5.2	Innovation linkages	50.1	15	
5.2.1	University/industry research collaboration†	65.0	18	
5.2.2	State of cluster development†	62.9	18	
5.2.3	GERD financed by abroad, %	6.0	61	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.1	4	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	1.0	16	
5.3	Knowledge absorption	41.6	35	
5.3.1	Royalty & license fees payments, % total trade	1.9	9	
5.3.2	High-tech imports less re-imports, % total trade	10.2	30	
5.3.3	Comm., computer & info. services imp., % total trade	1.0	58	○
5.3.4	FDI net inflows, % GDP	3.7	44	
6	**Knowledge & technology outputs**	**41.9**	**21**	
6.1	Knowledge creation	45.0	18	
6.1.1	Domestic resident patent app./bn PPP$ GDP	3.0	32	
6.1.2	PCT resident patent app./bn PPP$ GDP	1.9	24	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	37.4	17	
6.1.5	Citable documents H index	725.0	5	●
6.2	Knowledge impact	39.7	56	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.1	97	○
6.2.2	New businesses/th pop. 15–64	1.1	66	○
6.2.3	Computer software spending, % GDP	0.8	3	●
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	5.5	59	
6.2.5	High- & medium-high-tech manufactures, %	28.5	39	
6.3	Knowledge diffusion	41.0	33	
6.3.1	Royalty & license fees receipts, % total trade	0.7	19	
6.3.2	High-tech exports less re-exports, % total trade	5.7	29	
6.3.3	Comm., computer & info. services exp., % total trade	1.7	52	○
6.3.4	FDI net outflows, % GDP	2.5	26	
7	**Creative outputs**	**50.9**	**18**	
7.1	Intangible assets	55.9	23	
7.1.1	Domestic res trademark app./bn PPP$ GDP	51.4	47	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	68.9	20	
7.1.4	ICTs & organizational model creation†	70.8	12	
7.2	Creative goods & services	23.3	55	
7.2.1	Cultural & creative services exports, % total trade	0.7	28	
7.2.2	National feature films/mn pop. 15–69	3.6	46	○
7.2.3	Global ent. & media output/th pop. 15–69	49.5	13	
7.2.4	Printing & publishing output manufactures, %	0.4	93	○
7.2.5	Creative goods exports, % total trade	1.0	39	
7.3	Online creativity	68.5	11	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	89.9	6	●
7.3.2	Country-code TLDs/th pop. 15–69	37.7	20	
7.3.3	Wikipedia edits/pop. 15–69	7,167.2	16	
7.3.4	Video uploads on YouTube/pop. 15–69	93.5	6	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Chile

Key indicators

Population (millions)	17.8
GDP (US$ billions)	258.0
GDP per capita, PPP$	19,887.3
Income group	High income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**41.2**	**42**	
Innovation Output Sub-Index		33.4	48	
Innovation Input Sub-Index		49.0	36	
Innovation Efficiency Ratio		0.7	82	
Global Innovation Index 2014 (out of 143)		40.6	46	
1	**Institutions**	**73.8**	**37**	
1.1	Political environment	74.2	34	
1.1.1	Political stability*	73.4	50	
1.1.2	Government effectiveness*	75.0	25	
1.2	Regulatory environment	73.4	44	
1.2.1	Regulatory quality*	87.2	16	●
1.2.2	Rule of law*	83.2	22	
1.2.3	Cost of redundancy dismissal, salary weeks	27.4	118	○
1.3	Business environment	73.9	54	
1.3.1	Ease of starting a business*	89.8	50	
1.3.2	Ease of resolving insolvency*	47.4	68	
1.3.3	Ease of paying taxes*	84.5	28	
2	**Human capital & research**	**32.3**	**57**	
2.1	Education	42.2	78	
2.1.1	Expenditure on education, % GDP	4.6	71	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	18.1	68	
2.1.3	School life expectancy, years	15.2	37	
2.1.4	PISA scales in reading, maths, & science	436.3	45	○
2.1.5	Pupil-teacher ratio, secondary	20.0	85	○
2.2	Tertiary education	34.7	59	
2.2.1	Tertiary enrolment, % gross	74.4	18	●
2.2.2	Graduates in science & engineering, %	19.2	58	
2.2.3	Tertiary inbound mobility, %	0.3	101	○
2.3	Research & development (R&D)	19.9	46	
2.3.1	Researchers, FTE/mn pop.◴	389.2	62	
2.3.2	Gross expenditure on R&D, % GDP◴	0.4	72	
2.3.3	QS university ranking, average score top 3*	46.8	29	
3	**Infrastructure**	**50.0**	**35**	
3.1	Information & communication technologies (ICTs)	70.1	26	
3.1.1	ICT access*	63.5	60	
3.1.2	ICT use*	40.8	55	
3.1.3	Government's online service*	81.9	16	●
3.1.4	E-participation*	94.1	7	●
3.2	General infrastructure	34.7	57	
3.2.1	Electricity output, kWh/cap	4,282.7	49	
3.2.2	Logistics performance*	55.8	40	
3.2.3	Gross capital formation, % GDP	22.2	64	
3.3	Ecological sustainability	45.2	44	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.5	56	
3.3.2	Environmental performance*	69.9	29	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.5	41	
4	**Market sophistication**	**50.9**	**51**	
4.1	Credit	30.7	71	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	105.9	29	
4.1.3	Microfinance gross loans, % GDP	0.7	43	
4.2	Investment	40.8	49	
4.2.1	Ease of protecting investors*	58.3	54	
4.2.2	Market capitalization, % GDP	117.7	7	●
4.2.3	Total value of stocks traded, % GDP	17.6	30	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	68	○
4.3	Trade & competition	81.3	46	
4.3.1	Applied tariff rate, weighted mean, %◴	4.0	64	
4.3.2	Intensity of local competition†	76.5	25	
5	**Business sophistication**	**37.7**	**51**	
5.1	Knowledge workers	45.2	46	
5.1.1	Knowledge-intensive employment, %	24.3	60	
5.1.2	Firms offering formal training, % firms◴	57.5	13	●
5.1.3	GERD performed by business, % of GDP◴	0.1	56	○
5.1.4	GERD financed by business, %◴	34.9	44	
5.1.5	Females employed w/advanced degrees, % total	14.5	39	
5.2	Innovation linkages	30.6	76	
5.2.1	University/industry research collaboration†	53.3	37	
5.2.2	State of cluster development†	48.4	58	
5.2.3	GERD financed by abroad, %◴	17.5	24	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	45	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	85	○
5.3	Knowledge absorption	37.5	51	
5.3.1	Royalty & license fees payments, % total trade	1.0	27	
5.3.2	High-tech imports less re-imports, % total trade	9.7	35	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.8	67	
5.3.4	FDI net inflows, % GDP	7.3	18	●
6	**Knowledge & technology outputs**	**28.3**	**57**	
6.1	Knowledge creation	10.7	67	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.9	67	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.4	46	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.2	44	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	16.6	46	
6.1.5	Citable documents H index	214.0	37	
6.2	Knowledge impact	44.4	40	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.8	16	●
6.2.2	New businesses/th pop. 15–64	5.7	20	
6.2.3	Computer software spending, % GDP	0.3	45	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	10.7	38	
6.2.5	High- & medium-high-tech manufactures, %◴	21.7	52	
6.3	Knowledge diffusion	29.9	58	
6.3.1	Royalty & license fees receipts, % total trade	0.1	58	
6.3.2	High-tech exports less re-exports, % total trade	0.7	71	
6.3.3	Comm., computer & info. services exp., % total trade◴	0.4	101	○
6.3.4	FDI net outflows, % GDP	3.9	16	●
7	**Creative outputs**	**38.6**	**45**	
7.1	Intangible assets	55.7	25	
7.1.1	Domestic res trademark app./bn PPP$ GDP	73.6	24	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	66.4	28	
7.1.4	ICTs & organizational model creation†	59.9	40	
7.2	Creative goods & services	8.2	104	○
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	2.4	55	
7.2.3	Global ent. & media output/th pop. 15–69	8.6	37	○
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.2	75	
7.3	Online creativity	34.7	40	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.5	81	
7.3.2	Country-code TLDs/th pop. 15–69	15.6	38	
7.3.3	Wikipedia edits/pop. 15–69	5,520.3	21	●
7.3.4	Video uploads on YouTube/pop. 15–69	80.2	34	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

China

Key indicators

Population (millions)	1,393.8
GDP (US$ billions)	10,380.4
GDP per capita, PPP$	10,694.7
Income group	Upper-middle income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**47.5**	**29**	
Innovation Output Sub-Index		46.6	21	
Innovation Input Sub-Index		48.4	41	
Innovation Efficiency Ratio		1.0	6	●
Global Innovation Index 2014 (out of 143)		46.6	29	
1	**Institutions**	**54.0**	**91**	
1.1	Political environment	45.6	79	
1.1.1	Political stability*	50.7	99	
1.1.2	Government effectiveness*	40.6	70	
1.2	Regulatory environment	49.6	115	
1.2.1	Regulatory quality*	39.6	92	
1.2.2	Rule of law*	35.5	88	
1.2.3	Cost of redundancy dismissal, salary weeks	27.4	118	○
1.3	Business environment	66.7	78	
1.3.1	Ease of starting a business*	77.4	105	
1.3.2	Ease of resolving insolvency*	55.3	51	
1.3.3	Ease of paying taxes*	67.4	94	
2	**Human capital & research**	**43.1**	**31**	
2.1	Education	70.8	2	●
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	13.1	78	
2.1.4	PISA scales in reading, maths, & science	587.5	1	●
2.1.5	Pupil-teacher ratio, secondary	14.5	59	
2.2	Tertiary education	11.7	121	○
2.2.1	Tertiary enrolment, % gross	26.7	82	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	0.3	103	○
2.3	Research & development (R&D)	46.9	21	
2.3.1	Researchers, FTE/mn pop.	1,071.1	47	
2.3.2	Gross expenditure on R&D, % GDP	2.1	17	
2.3.3	QS university ranking, average score top 3*	78.5	11	
3	**Infrastructure**	**50.5**	**32**	
3.1	Information & communication technologies (ICTs)	51.6	54	
3.1.1	ICT access*	51.0	77	
3.1.2	ICT use*	29.9	71	
3.1.3	Government's online service*	60.6	47	
3.1.4	E-participation*	64.7	33	
3.2	General infrastructure	65.1	3	●
3.2.1	Electricity output, kWh/cap	3,690.5	52	
3.2.2	Logistics performance*	69.9	27	
3.2.3	Gross capital formation, % GDP	47.7	4	●
3.3	Ecological sustainability	35.0	82	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.5	103	○
3.3.2	Environmental performance*	43.0	102	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	6.5	17	
4	**Market sophistication**	**49.2**	**59**	
4.1	Credit	31.9	63	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	140.0	16	
4.1.3	Microfinance gross loans, % GDP	0.0	86	○
4.2	Investment	36.6	62	
4.2.1	Ease of protecting investors*	45.0	114	○
4.2.2	Market capitalization, % GDP	44.9	44	
4.2.3	Total value of stocks traded, % GDP	70.8	8	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	34	
4.3	Trade & competition	79.2	59	
4.3.1	Applied tariff rate, weighted mean, %◴	4.1	66	
4.3.2	Intensity of local competition†	72.6	42	
5	**Business sophistication**	**44.9**	**31**	
5.1	Knowledge workers	61.2	20	
5.1.1	Knowledge-intensive employment, %◴	7.4	104	○
5.1.2	Firms offering formal training, % firms◴	79.2	1	●
5.1.3	GERD performed by business, % of GDP	1.6	13	
5.1.4	GERD financed by business, %	74.6	3	●
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	31.1	71	
5.2.1	University/industry research collaboration†	56.7	31	
5.2.2	State of cluster development†	59.3	23	
5.2.3	GERD financed by abroad, %	0.9	89	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	57	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.3	29	
5.3	Knowledge absorption	42.6	32	
5.3.1	Royalty & license fees payments, % total trade	0.9	35	
5.3.2	High-tech imports less re-imports, % total trade	18.8	8	●
5.3.3	Comm., computer & info. services imp., % total trade	0.3	112	○
5.3.4	FDI net inflows, % GDP	3.8	40	
6	**Knowledge & technology outputs**	**58.0**	**3**	●
6.1	Knowledge creation	64.1	6	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	43.6	1	●
6.1.2	PCT resident patent app./bn PPP$ GDP	1.4	27	
6.1.3	Domestic res utility model app./bn PPP$ GDP	54.7	1	●
6.1.4	Scientific & technical articles/bn PPP$ GDP	14.0	53	
6.1.5	Citable documents H index	436.0	16	
6.2	Knowledge impact	67.2	1	●
6.2.1	Growth rate of PPP$ GDP/worker, %	7.1	1	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.4	23	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	20.8	19	
6.2.5	High- & medium-high-tech manufactures, %	43.1	15	
6.3	Knowledge diffusion	42.8	28	
6.3.1	Royalty & license fees receipts, % total trade	0.0	76	
6.3.2	High-tech exports less re-exports, % total trade	28.4	1	●
6.3.3	Comm., computer & info. services exp., % total trade	0.7	86	
6.3.4	FDI net outflows, % GDP	1.8	36	
7	**Creative outputs**	**35.1**	**54**	
7.1	Intangible assets	52.4	39	
7.1.1	Domestic res trademark app./bn PPP$ GDP	107.2	11	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.1	54	
7.1.3	ICTs & business model creation†	60.6	47	
7.1.4	ICTs & organizational model creation†	61.4	32	
7.2	Creative goods & services	33.0	35	
7.2.1	Cultural & creative services exports, % total trade	0.2	49	
7.2.2	National feature films/mn pop. 15–69	0.6	89	○
7.2.3	Global ent. & media output/th pop. 15–69	3.0	47	
7.2.4	Printing & publishing output manufactures, %	0.5	91	○
7.2.5	Creative goods exports, % total trade	14.0	1	●
7.3	Online creativity	2.6	104	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.3	84	
7.3.2	Country-code TLDs/th pop. 15–69	4.5	54	
7.3.3	Wikipedia edits/pop. 15–69	149.8	110	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Colombia

Key indicators

Population (millions)	48.9
GDP (US$ billions)	384.9
GDP per capita, PPP$	11,730.3
Income group	Upper-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**36.4**	**67**	
Innovation Output Sub-Index		27.4	75	
Innovation Input Sub-Index		45.4	51	
Innovation Efficiency Ratio		0.6	114	○
Global Innovation Index 2014 (out of 143)		35.5	68	
1	**Institutions**	**58.2**	**77**	
1.1	Political environment	37.7	107	
1.1.1	Political stability*	32.8	127	○
1.1.2	Government effectiveness*	42.5	66	
1.2	Regulatory environment	64.9	76	
1.2.1	Regulatory quality*	58.1	57	
1.2.2	Rule of law*	35.7	87	
1.2.3	Cost of redundancy dismissal, salary weeks	16.7	76	
1.3	Business environment	71.9	58	
1.3.1	Ease of starting a business*	86.1	70	
1.3.2	Ease of resolving insolvency*	70.0	28	
1.3.3	Ease of paying taxes*	59.7	112	○
2	**Human capital & research**	**31.2**	**59**	
2.1	Education	35.7	95	
2.1.1	Expenditure on education, % GDP	4.9	63	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	17.0	73	
2.1.3	School life expectancy, years◴	13.5	68	
2.1.4	PISA scales in reading, maths, & science	392.9	58	○
2.1.5	Pupil-teacher ratio, secondary	25.2	96	○
2.2	Tertiary education	41.8	37	
2.2.1	Tertiary enrolment, % gross	48.3	52	
2.2.2	Graduates in science & engineering, %	21.5	45	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	16.1	51	
2.3.1	Researchers, FTE/mn pop.◴	161.5	74	
2.3.2	Gross expenditure on R&D, % GDP	0.2	84	
2.3.3	QS university ranking, average score top 3*	41.4	34	
3	**Infrastructure**	**48.4**	**39**	
3.1	Information & communication technologies (ICTs)	63.0	38	
3.1.1	ICT access*	54.4	74	
3.1.2	ICT use*	30.7	68	
3.1.3	Government's online service*	78.7	17	●
3.1.4	E-participation*	88.2	11	●
3.2	General infrastructure	26.0	95	
3.2.1	Electricity output, kWh/cap	1,306.9	91	
3.2.2	Logistics performance*	24.4	92	
3.2.3	Gross capital formation, % GDP	25.0	44	
3.3	Ecological sustainability	56.1	14	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	15.6	2	●
3.3.2	Environmental performance*	50.8	76	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	4.6	23	●
4	**Market sophistication**	**53.7**	**38**	
4.1	Credit	44.8	34	
4.1.1	Ease of getting credit*	95.0	2	●
4.1.2	Domestic credit to private sector, % GDP	50.2	67	
4.1.3	Microfinance gross loans, % GDP	2.0	27	
4.2	Investment	38.7	58	
4.2.1	Ease of protecting investors*	71.7	10	●
4.2.2	Market capitalization, % GDP	70.8	22	
4.2.3	Total value of stocks traded, % GDP	7.0	45	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	61	○
4.3	Trade & competition	77.5	65	
4.3.1	Applied tariff rate, weighted mean, %	4.4	75	
4.3.2	Intensity of local competition†	70.3	54	
5	**Business sophistication**	**35.8**	**63**	
5.1	Knowledge workers	42.4	53	
5.1.1	Knowledge-intensive employment, %◴	16.8	86	
5.1.2	Firms offering formal training, % firms◴	65.2	5	●
5.1.3	GERD performed by business, % of GDP	0.1	70	
5.1.4	GERD financed by business, %	29.0	50	
5.1.5	Females employed w/advanced degrees, % total	13.2	47	
5.2	Innovation linkages	22.1	116	○
5.2.1	University/industry research collaboration†	48.8	47	
5.2.2	State of cluster development†	45.2	75	
5.2.3	GERD financed by abroad, %	2.4	79	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	58	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	94	○
5.3	Knowledge absorption	42.8	31	
5.3.1	Royalty & license fees payments, % total trade	0.8	39	
5.3.2	High-tech imports less re-imports, % total trade	15.6	13	●
5.3.3	Comm., computer & info. services imp., % total trade	0.8	66	
5.3.4	FDI net inflows, % GDP	4.4	35	
6	**Knowledge & technology outputs**	**23.7**	**86**	
6.1	Knowledge creation	6.4	93	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.4	78	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.2	55	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.4	39	
6.1.4	Scientific & technical articles/bn PPP$ GDP	5.1	97	
6.1.5	Citable documents H index	151.0	47	
6.2	Knowledge impact	39.7	57	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.2	41	
6.2.2	New businesses/th pop. 15–64	2.0	47	
6.2.3	Computer software spending, % GDP	0.2	64	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	22.2	17	●
6.2.5	High- & medium-high-tech manufactures, %	22.1	50	
6.3	Knowledge diffusion	25.1	87	
6.3.1	Royalty & license fees receipts, % total trade	0.1	53	
6.3.2	High-tech exports less re-exports, % total trade	1.2	60	
6.3.3	Comm., computer & info. services exp., % total trade	0.4	100	○
6.3.4	FDI net outflows, % GDP	2.0	33	
7	**Creative outputs**	**31.0**	**77**	
7.1	Intangible assets	38.7	95	
7.1.1	Domestic res trademark app./bn PPP$ GDP	32.0	68	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.1	56	○
7.1.3	ICTs & business model creation†	60.2	49	
7.1.4	ICTs & organizational model creation†	57.6	52	
7.2	Creative goods & services	18.2	71	
7.2.1	Cultural & creative services exports, % total trade	0.4	40	
7.2.2	National feature films/mn pop. 15–69	0.8	83	
7.2.3	Global ent. & media output/th pop. 15–69	5.7	44	
7.2.4	Printing & publishing output manufactures, %	2.6	17	●
7.2.5	Creative goods exports, % total trade	0.3	72	
7.3	Online creativity	28.4	45	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.4	68	
7.3.2	Country-code TLDs/th pop. 15–69	21.3	33	
7.3.3	Wikipedia edits/pop. 15–69	2,259.6	49	
7.3.4	Video uploads on YouTube/pop. 15–69	72.2	55	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Costa Rica

Key indicators

Population (millions)	4.9
GDP (US$ billions)	48.1
GDP per capita, PPP$	13,341.1
Income group	Upper-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
	Global Innovation Index (out of 141)	**38.6**	**51**	
	Innovation Output Sub-Index	34.0	45	
	Innovation Input Sub-Index	43.2	61	
	Innovation Efficiency Ratio	0.8	32	
	Global Innovation Index 2014 (out of 143)	37.3	57	
1	**Institutions**	**67.3**	**56**	
1.1	Political environment	67.4	45	
1.1.1	Political stability*	80.6	38	
1.1.2	Government effectiveness*	54.1	45	
1.2	Regulatory environment	70.4	52	
1.2.1	Regulatory quality*	63.2	47	
1.2.2	Rule of law*	60.8	43	
1.2.3	Cost of redundancy dismissal, salary weeks	18.7	84	
1.3	Business environment	64.0	86	
1.3.1	Ease of starting a business*	80.9	96	
1.3.2	Ease of resolving insolvency*	44.0	83	
1.3.3	Ease of paying taxes*	67.3	95	
2	**Human capital & research**	**26.3**	**80**	
2.1	Education	48.2	57	
2.1.1	Expenditure on education, % GDP	6.9	14	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	24.8	40	
2.1.3	School life expectancy, years	13.9	60	
2.1.4	PISA scales in reading, maths, & science	425.6	46	○
2.1.5	Pupil-teacher ratio, secondary	13.8	50	
2.2	Tertiary education	22.0	98	
2.2.1	Tertiary enrolment, % gross	47.6	55	
2.2.2	Graduates in science & engineering, %◴	11.9	95	○
2.2.3	Tertiary inbound mobility, %◴	1.4	74	
2.3	Research & development (R&D)	8.8	72	
2.3.1	Researchers, FTE/mn pop.◴	1,289.0	42	
2.3.2	Gross expenditure on R&D, % GDP◴	0.5	64	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**44.7**	**49**	
3.1	Information & communication technologies (ICTs)	62.8	40	
3.1.1	ICT access*	62.7	62	
3.1.2	ICT use*	44.8	48	
3.1.3	Government's online service*	61.4	43	
3.1.4	E-participation*	82.4	14	●
3.2	General infrastructure	24.5	102	
3.2.1	Electricity output, kWh/cap	2,115.4	77	
3.2.2	Logistics performance*	27.5	82	
3.2.3	Gross capital formation, % GDP	21.9	68	
3.3	Ecological sustainability	46.8	38	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	11.9	15	●
3.3.2	Environmental performance*	58.5	51	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.2	58	
4	**Market sophistication**	**38.4**	**120**	○
4.1	Credit	20.7	112	○
4.1.1	Ease of getting credit*	45.0	80	
4.1.2	Domestic credit to private sector, % GDP	50.4	66	
4.1.3	Microfinance gross loans, % GDP	0.1	62	
4.2	Investment	14.8	141	○
4.2.1	Ease of protecting investors*	28.3	141	○
4.2.2	Market capitalization, % GDP	4.4	102	○
4.2.3	Total value of stocks traded, % GDP	0.1	101	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	79.5	55	
4.3.1	Applied tariff rate, weighted mean, %◴	3.1	58	
4.3.2	Intensity of local competition†	69.7	57	
5	**Business sophistication**	**39.4**	**42**	
5.1	Knowledge workers	40.6	61	
5.1.1	Knowledge-intensive employment, %	25.0	56	
5.1.2	Firms offering formal training, % firms◴	54.7	20	●
5.1.3	GERD performed by business, % of GDP◴	0.1	65	
5.1.4	GERD financed by business, %◴	18.8	64	
5.1.5	Females employed w/advanced degrees, % total	13.2	48	
5.2	Innovation linkages	30.6	75	
5.2.1	University/industry research collaboration†	56.0	32	
5.2.2	State of cluster development†	53.9	36	
5.2.3	GERD financed by abroad, %◴	6.5	58	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	83	
5.3	Knowledge absorption	46.9	20	●
5.3.1	Royalty & license fees payments, % total trade	0.3	72	
5.3.2	High-tech imports less re-imports, % total trade	20.9	5	●
5.3.3	Comm., computer & info. services imp., % total trade	0.6	84	
5.3.4	FDI net inflows, % GDP	6.5	23	●
6	**Knowledge & technology outputs**	**30.3**	**47**	
6.1	Knowledge creation	4.4	109	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.3	84	○
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	61	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.0	58	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	7.2	80	
6.1.5	Citable documents H index	115.0	62	
6.2	Knowledge impact	32.8	95	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.0	47	
6.2.2	New businesses/th pop. 15–64	3.5	34	
6.2.3	Computer software spending, % GDP	0.3	48	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.2	78	
6.2.5	High- & medium-high-tech manufactures, %	11.9	72	
6.3	Knowledge diffusion	53.8	11	●
6.3.1	Royalty & license fees receipts, % total trade	0.0	85	
6.3.2	High-tech exports less re-exports, % total trade	16.8	8	●
6.3.3	Comm., computer & info. services exp., % total trade	11.1	1	●
6.3.4	FDI net outflows, % GDP	1.6	39	
7	**Creative outputs**	**37.6**	**48**	
7.1	Intangible assets	59.8	13	●
7.1.1	Domestic res trademark app./bn PPP$ GDP◴	101.0	12	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	62.2	41	
7.1.4	ICTs & organizational model creation†	60.8	36	
7.2	Creative goods & services	20.3	67	
7.2.1	Cultural & creative services exports, % total trade	0.0	75	○
7.2.2	National feature films/mn pop. 15–69	0.6	92	○
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	2.7	14	●
7.2.5	Creative goods exports, % total trade	0.6	52	
7.3	Online creativity	10.4	77	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	12.8	39	
7.3.2	Country-code TLDs/th pop. 15–69	1.9	73	
7.3.3	Wikipedia edits/pop. 15–69	2,245.2	50	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Côte d'Ivoire

Key indicators

Population (millions)	20.8
GDP (US$ billions)	34.0
GDP per capita, PPP$	1,938.2
Income group	Lower-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**27.2**	**116**	
Innovation Output Sub-Index		25.7	87	
Innovation Input Sub-Index		28.6	131	○
Innovation Efficiency Ratio		0.9	10	●
Global Innovation Index 2014 (out of 143)		27.0	116	
1	**Institutions**	**47.7**	**113**	
1.1	Political environment	25.8	129	○
1.1.1	Political stability*	38.2	115	
1.1.2	Government effectiveness*	13.4	130	○
1.2	Regulatory environment	57.8	93	
1.2.1	Regulatory quality*	28.4	119	
1.2.2	Rule of law*	22.8	121	
1.2.3	Cost of redundancy dismissal, salary weeks	13.1	54	●
1.3	Business environment	59.6	104	
1.3.1	Ease of starting a business*	91.2	38	●
1.3.2	Ease of resolving insolvency*	45.0	80	●
1.3.3	Ease of paying taxes*	42.7	132	○
2	**Human capital & research**	**16.0**	**118**	
2.1	Education	34.7	103	
2.1.1	Expenditure on education, % GDP◴	4.6	69	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	8.9	122	○
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	22.7	91	
2.2	Tertiary education	12.9	118	
2.2.1	Tertiary enrolment, % gross	9.1	116	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	4.4	39	●
2.3	Research & development (R&D)	0.4	120	
2.3.1	Researchers, FTE/mn pop.◴	73.0	86	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**19.8**	**131**	○
3.1	Information & communication technologies (ICTs)	17.1	127	○
3.1.1	ICT access*	31.9	112	
3.1.2	ICT use*	1.6	132	○
3.1.3	Government's online service*	17.3	122	
3.1.4	E-participation*	17.6	124	○
3.2	General infrastructure	19.6	120	
3.2.1	Electricity output, kWh/cap	353.6	108	
3.2.2	Logistics performance*	30.6	76	●
3.2.3	Gross capital formation, % GDP	18.8	104	
3.3	Ecological sustainability	22.7	126	○
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	3.8	111	○
3.3.2	Environmental performance*	39.7	108	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	112	
4	**Market sophistication**	**35.3**	**132**	○
4.1	Credit	12.3	128	○
4.1.1	Ease of getting credit*	30.0	113	
4.1.2	Domestic credit to private sector, % GDP	18.4	117	
4.1.3	Microfinance gross loans, % GDP	0.2	59	
4.2	Investment	25.8	119	
4.2.1	Ease of protecting investors*	42.5	120	
4.2.2	Market capitalization, % GDP	28.9	58	●
4.2.3	Total value of stocks traded, % GDP	0.6	76	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	67.7	103	
4.3.1	Applied tariff rate, weighted mean, %	6.8	100	
4.3.2	Intensity of local competition†	59.2	108	
5	**Business sophistication**	**24.0**	**127**	○
5.1	Knowledge workers	20.7	120	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	19.1	92	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	28.5	86	
5.2.1	University/industry research collaboration†	39.0	83	
5.2.2	State of cluster development†	37.6	106	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	108	○
5.3	Knowledge absorption	22.8	128	○
5.3.1	Royalty & license fees payments, % total trade◴	0.2	95	
5.3.2	High-tech imports less re-imports, % total trade	4.6	104	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.8	70	●
5.3.4	FDI net inflows, % GDP	1.2	106	
6	**Knowledge & technology outputs**	**26.8**	**65**	
6.1	Knowledge creation	3.7	117	
6.1.1	Domestic resident patent app./bn PPP$ GDP◴	0.4	76	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	81	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	3.2	114	
6.1.5	Citable documents H index	76.0	91	
6.2	Knowledge impact	58.4	3	
6.2.1	Growth rate of PPP$ GDP/worker, %	5.2	8	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.0	113	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	18.1	118	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	107	○
6.3.2	High-tech exports less re-exports, % total trade	0.9	68	●
6.3.3	Comm., computer & info. services exp., % total trade◴	0.9	80	
6.3.4	FDI net outflows, % GDP◴	0.2	86	
7	**Creative outputs**	**24.7**	**102**	
7.1	Intangible assets	48.9	51	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	49.2	97	
7.1.4	ICTs & organizational model creation†	48.6	83	
7.2	Creative goods & services	0.8	134	○
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade◴	0.0	114	
7.3	Online creativity	0.3	122	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.6	114	
7.3.2	Country-code TLDs/th pop. 15–69	0.2	114	
7.3.3	Wikipedia edits/pop. 15–69	23.7	132	○
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Croatia

Key indicators

Population (millions)	4.3
GDP (US$ billions)	57.2
GDP per capita, PPP$	18,354.7
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**41.7**	**40**	
Innovation Output Sub-Index		35.7	41	
Innovation Input Sub-Index		47.7	43	
Innovation Efficiency Ratio		0.8	50	
Global Innovation Index 2014 (out of 143)		40.7	42	
1	**Institutions**	**71.8**	**41**	
1.1	Political environment	69.7	39	
1.1.1	Political stability*	79.3	39	
1.1.2	Government effectiveness*	60.0	41	
1.2	Regulatory environment	71.5	47	
1.2.1	Regulatory quality*	59.5	53	
1.2.2	Rule of law*	54.7	53	
1.2.3	Cost of redundancy dismissal, salary weeks	15.1	66	
1.3	Business environment	74.1	52	
1.3.1	Ease of starting a business*	85.4	73	
1.3.2	Ease of resolving insolvency*	53.9	54	
1.3.3	Ease of paying taxes*	82.9	32	●
2	**Human capital & research**	**36.9**	**47**	
2.1	Education	58.1	15	●
2.1.1	Expenditure on education, % GDP	4.2	79	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	14.8	44	
2.1.4	PISA scales in reading, maths, & science	482.4	33	
2.1.5	Pupil-teacher ratio, secondary	7.8	3	●
2.2	Tertiary education	37.5	51	
2.2.1	Tertiary enrolment, % gross	61.6	38	
2.2.2	Graduates in science & engineering, %	23.8	30	
2.2.3	Tertiary inbound mobility, %	0.5	92	○
2.3	Research & development (R&D)	15.1	54	
2.3.1	Researchers, FTE/mn pop.	1,522.0	40	
2.3.2	Gross expenditure on R&D, % GDP	0.8	41	
2.3.3	QS university ranking, average score top 3*	7.9	64	
3	**Infrastructure**	**44.6**	**50**	
3.1	Information & communication technologies (ICTs)	52.3	53	
3.1.1	ICT access*	73.1	37	
3.1.2	ICT use*	56.2	29	●
3.1.3	Government's online service*	46.5	70	
3.1.4	E-participation*	33.3	92	○
3.2	General infrastructure	26.4	92	○
3.2.1	Electricity output, kWh/cap	2,434.4	72	
3.2.2	Logistics performance*	45.5	53	
3.2.3	Gross capital formation, % GDP	19.1	100	○
3.3	Ecological sustainability	55.1	16	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	8.6	45	
3.3.2	Environmental performance*	62.2	44	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	9.5	8	●
4	**Market sophistication**	**47.1**	**68**	
4.1	Credit	26.5	84	
4.1.1	Ease of getting credit*	55.0	56	
4.1.2	Domestic credit to private sector, % GDP	76.7	40	
4.1.3	Microfinance gross loans, % GDP◴	0.0	80	○
4.2	Investment	34.8	69	
4.2.1	Ease of protecting investors*	57.5	60	
4.2.2	Market capitalization, % GDP	38.2	51	
4.2.3	Total value of stocks traded, % GDP	0.9	68	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	80.1	53	
4.3.1	Applied tariff rate, weighted mean, %	1.4	38	
4.3.2	Intensity of local competition†	64.7	80	
5	**Business sophistication**	**37.9**	**50**	
5.1	Knowledge workers	49.7	36	
5.1.1	Knowledge-intensive employment, %	35.4	35	
5.1.2	Firms offering formal training, % firms	48.9	29	
5.1.3	GERD performed by business, % of GDP	0.4	37	
5.1.4	GERD financed by business, %	42.8	34	
5.1.5	Females employed w/advanced degrees, % total	13.8	45	
5.2	Innovation linkages	26.5	94	○
5.2.1	University/industry research collaboration†	39.9	78	
5.2.2	State of cluster development†	36.1	113	○
5.2.3	GERD financed by abroad, %	15.5	30	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	35	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	55	
5.3	Knowledge absorption	37.6	49	
5.3.1	Royalty & license fees payments, % total trade	1.0	31	
5.3.2	High-tech imports less re-imports, % total trade	7.6	58	
5.3.3	Comm., computer & info. services imp., % total trade	1.7	33	
5.3.4	FDI net inflows, % GDP	1.0	113	○
6	**Knowledge & technology outputs**	**31.0**	**44**	
6.1	Knowledge creation	20.7	48	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.6	38	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.6	34	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.9	30	
6.1.4	Scientific & technical articles/bn PPP$ GDP	35.0	20	●
6.1.5	Citable documents H index	161.0	42	
6.2	Knowledge impact	46.1	34	●
6.2.1	Growth rate of PPP$ GDP/worker, %	0.1	96	○
6.2.2	New businesses/th pop. 15–64	2.8	39	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	30.1	9	●
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	26.2	78	
6.3.1	Royalty & license fees receipts, % total trade	0.1	52	
6.3.2	High-tech exports less re-exports, % total trade	4.1	37	
6.3.3	Comm., computer & info. services exp., % total trade	2.0	41	
6.3.4	FDI net outflows, % GDP	(0.3)	116	○
7	**Creative outputs**	**40.5**	**39**	
7.1	Intangible assets	47.4	61	
7.1.1	Domestic res trademark app./bn PPP$ GDP	53.1	42	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.8	13	●
7.1.3	ICTs & business model creation†	57.9	62	
7.1.4	ICTs & organizational model creation†	57.8	50	
7.2	Creative goods & services	34.6	29	●
7.2.1	Cultural & creative services exports, % total trade	1.4	6	●
7.2.2	National feature films/mn pop. 15–69	8.4	21	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.5	60	
7.3	Online creativity	32.7	43	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	15.9	34	●
7.3.2	Country-code TLDs/th pop. 15–69	11.9	40	
7.3.3	Wikipedia edits/pop. 15–69	3,562.7	37	
7.3.4	Video uploads on YouTube/pop. 15–69	76.7	42	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Cyprus

Key indicators

Population (millions)	1.2
GDP (US$ billions)	23.3
GDP per capita, PPP$	24,170.5
Income group	High income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**43.5**	**34**	
Innovation Output Sub-Index		34.7	43	
Innovation Input Sub-Index		52.4	32	
Innovation Efficiency Ratio		0.7	90	
Global Innovation Index 2014 (out of 143)		45.8	30	
1	**Institutions**	**79.8**	**28**	
1.1	Political environment	77.4	28	
1.1.1	Political stability*	77.0	42	
1.1.2	Government effectiveness*	77.9	22	
1.2	Regulatory environment	86.6	20	
1.2.1	Regulatory quality*	72.1	34	
1.2.2	Rule of law*	74.2	29	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	75.5	45	
1.3.1	Ease of starting a business*	89.2	54	
1.3.2	Ease of resolving insolvency*	56.7	49	
1.3.3	Ease of paying taxes*	80.5	44	
2	**Human capital & research**	**40.6**	**35**	
2.1	Education	58.7	11	●
2.1.1	Expenditure on education, % GDP	7.2	12	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	41.7	6	●
2.1.3	School life expectancy, years	14.0	57	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	9.7	25	
2.2	Tertiary education	55.8	9	●
2.2.1	Tertiary enrolment, % gross	45.9	59	
2.2.2	Graduates in science & engineering, %	21.5	44	
2.2.3	Tertiary inbound mobility, %	23.5	1	●
2.3	Research & development (R&D)	7.1	75	
2.3.1	Researchers, FTE/mn pop.	775.5	50	
2.3.2	Gross expenditure on R&D, % GDP	0.5	60	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**37.8**	**75**	
3.1	Information & communication technologies (ICTs)	47.8	68	
3.1.1	ICT access*	69.3	48	
3.1.2	ICT use*	43.4	50	
3.1.3	Government's online service*	47.2	68	
3.1.4	E-participation*	31.4	101	○
3.2	General infrastructure	19.5	121	○
3.2.1	Electricity output, kWh/cap	5,484.9	36	
3.2.2	Logistics performance*	42.8	56	
3.2.3	Gross capital formation, % GDP	9.7	138	○
3.3	Ecological sustainability	46.2	39	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.2	36	
3.3.2	Environmental performance*	66.2	37	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.1	45	
4	**Market sophistication**	**64.3**	**11**	●
4.1	Credit	77.5	2	●
4.1.1	Ease of getting credit*	55.0	56	
4.1.2	Domestic credit to private sector, % GDP	300.6	1	●
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	30.3	95	
4.2.1	Ease of protecting investors*	68.3	14	●
4.2.2	Market capitalization, % GDP	8.8	92	○
4.2.3	Total value of stocks traded, % GDP	1.3	62	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	31	
4.3	Trade & competition	85.2	26	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	73.8	35	
5	**Business sophistication**	**39.2**	**43**	
5.1	Knowledge workers	40.2	62	
5.1.1	Knowledge-intensive employment, %	35.1	37	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	0.1	63	
5.1.4	GERD financed by business, %◴	10.9	69	○
5.1.5	Females employed w/advanced degrees, % total	22.6	16	
5.2	Innovation linkages	41.4	35	
5.2.1	University/industry research collaboration†	53.2	38	
5.2.2	State of cluster development†	50.7	47	
5.2.3	GERD financed by abroad, %◴	17.5	25	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	15	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.3	26	
5.3	Knowledge absorption	36.0	57	
5.3.1	Royalty & license fees payments, % total trade	0.3	74	
5.3.2	High-tech imports less re-imports, % total trade	4.6	105	○
5.3.3	Comm., computer & info. services imp., % total trade	2.1	11	●
5.3.4	FDI net inflows, % GDP	2.8	67	
6	**Knowledge & technology outputs**	**24.7**	**78**	
6.1	Knowledge creation	19.9	50	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.1	104	○
6.1.2	PCT resident patent app./bn PPP$ GDP	1.4	29	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	35.2	19	
6.1.5	Citable documents H index	100.0	71	
6.2	Knowledge impact	30.2	103	
6.2.1	Growth rate of PPP$ GDP/worker, %	(7.4)	116	○
6.2.2	New businesses/th pop. 15–64	22.5	1	●
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	15.4	24	
6.2.5	High- & medium-high-tech manufactures, %	13.4	70	
6.3	Knowledge diffusion	24.1	92	
6.3.1	Royalty & license fees receipts, % total trade	0.0	90	○
6.3.2	High-tech exports less re-exports, % total trade	0.6	72	
6.3.3	Comm., computer & info. services exp., % total trade	1.2	74	
6.3.4	FDI net outflows, % GDP	1.8	35	
7	**Creative outputs**	**44.6**	**27**	
7.1	Intangible assets	55.4	26	
7.1.1	Domestic res trademark app./bn PPP$ GDP	62.7	36	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	7.6	1	●
7.1.3	ICTs & business model creation†	56.8	66	
7.1.4	ICTs & organizational model creation†	52.8	64	
7.2	Creative goods & services	25.5	50	
7.2.1	Cultural & creative services exports, % total trade	0.8	22	
7.2.2	National feature films/mn pop. 15–69	1.2	71	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	3.1	11	●
7.2.5	Creative goods exports, % total trade	0.0	118	○
7.3	Online creativity	42.0	28	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	79.6	8	●
7.3.2	Country-code TLDs/th pop. 15–69	6.4	49	
7.3.3	Wikipedia edits/pop. 15–69	5,408.8	22	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Czech Republic

Key indicators

Population (millions)	10.7
GDP (US$ billions)	205.7
GDP per capita, PPP$	28,086.5
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**51.3**	**24**	
Innovation Output Sub-Index		48.5	17	
Innovation Input Sub-Index		54.2	27	
Innovation Efficiency Ratio		0.9	11	●
Global Innovation Index 2014 (out of 143)		50.2	26	
1	**Institutions**	**76.4**	**32**	
1.1	Political environment	77.6	27	
1.1.1	Political stability*	90.2	15	●
1.1.2	Government effectiveness*	65.1	37	
1.2	Regulatory environment	75.6	40	
1.2.1	Regulatory quality*	76.8	27	
1.2.2	Rule of law*	74.3	27	
1.2.3	Cost of redundancy dismissal, salary weeks	20.3	93	○
1.3	Business environment	75.9	43	
1.3.1	Ease of starting a business*	82.6	90	○
1.3.2	Ease of resolving insolvency*	77.5	18	
1.3.3	Ease of paying taxes*	67.7	93	○
2	**Human capital & research**	**45.8**	**29**	
2.1	Education	52.5	39	
2.1.1	Expenditure on education, % GDP	4.5	72	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	25.2	38	
2.1.3	School life expectancy, years	16.3	19	
2.1.4	PISA scales in reading, maths, & science	500.0	19	
2.1.5	Pupil-teacher ratio, secondary	11.2	34	
2.2	Tertiary education	44.5	33	
2.2.1	Tertiary enrolment, % gross	64.2	31	
2.2.2	Graduates in science & engineering, %	21.6	41	
2.2.3	Tertiary inbound mobility, %	9.0	19	
2.3	Research & development (R&D)	40.5	26	
2.3.1	Researchers, FTE/mn pop.	3,202.2	26	
2.3.2	Gross expenditure on R&D, % GDP	2.0	19	
2.3.3	QS university ranking, average score top 3*	35.5	37	
3	**Infrastructure**	**51.0**	**30**	
3.1	Information & communication technologies (ICTs)	46.8	71	
3.1.1	ICT access*	72.6	39	
3.1.2	ICT use*	52.2	35	
3.1.3	Government's online service*	37.0	87	○
3.1.4	E-participation*	25.5	110	○
3.2	General infrastructure	43.0	32	
3.2.1	Electricity output, kWh/cap	8,199.3	21	
3.2.2	Logistics performance*	67.9	31	
3.2.3	Gross capital formation, % GDP	22.4	60	
3.3	Ecological sustainability	63.0	6	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.0	91	○
3.3.2	Environmental performance*	81.5	5	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	15.8	1	●
4	**Market sophistication**	**52.4**	**45**	
4.1	Credit	43.6	37	
4.1.1	Ease of getting credit*	70.0	22	
4.1.2	Domestic credit to private sector, % GDP	55.4	59	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	25.8	118	○
4.2.1	Ease of protecting investors*	54.2	75	
4.2.2	Market capitalization, % GDP	18.0	74	○
4.2.3	Total value of stocks traded, % GDP	4.9	49	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	40	
4.3	Trade & competition	87.8	13	●
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	78.9	15	
5	**Business sophistication**	**45.3**	**28**	
5.1	Knowledge workers	53.7	32	
5.1.1	Knowledge-intensive employment, %	37.8	27	
5.1.2	Firms offering formal training, % firms	55.2	18	
5.1.3	GERD performed by business, % of GDP	1.1	21	
5.1.4	GERD financed by business, %	37.6	41	
5.1.5	Females employed w/advanced degrees, % total	10.6	59	○
5.2	Innovation linkages	36.4	53	
5.2.1	University/industry research collaboration†	50.0	40	
5.2.2	State of cluster development†	51.0	44	
5.2.3	GERD financed by abroad, %	27.2	16	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	65	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.2	32	
5.3	Knowledge absorption	45.9	24	
5.3.1	Royalty & license fees payments, % total trade	0.6	49	
5.3.2	High-tech imports less re-imports, % total trade	15.7	12	●
5.3.3	Comm., computer & info. services imp., % total trade	1.4	39	
5.3.4	FDI net inflows, % GDP	2.5	70	
6	**Knowledge & technology outputs**	**46.7**	**15**	●
6.1	Knowledge creation	48.0	16	
6.1.1	Domestic resident patent app./bn PPP$ GDP	3.2	30	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.6	36	
6.1.3	Domestic res utility model app./bn PPP$ GDP	5.5	7	
6.1.4	Scientific & technical articles/bn PPP$ GDP	35.4	18	
6.1.5	Citable documents H index	268.0	32	
6.2	Knowledge impact	49.6	21	
6.2.1	Growth rate of PPP$ GDP/worker, %	(0.4)	105	○
6.2.2	New businesses/th pop. 15–64	3.0	36	
6.2.3	Computer software spending, % GDP	0.3	34	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	41.7	4	●
6.2.5	High- & medium-high-tech manufactures, % ④	50.2	7	●
6.3	Knowledge diffusion	42.4	29	
6.3.1	Royalty & license fees receipts, % total trade	0.2	41	
6.3.2	High-tech exports less re-exports, % total trade	16.3	9	●
6.3.3	Comm., computer & info. services exp., % total trade	1.7	51	
6.3.4	FDI net outflows, % GDP	1.6	42	
7	**Creative outputs**	**50.2**	**21**	
7.1	Intangible assets	55.4	28	
7.1.1	Domestic res trademark app./bn PPP$ GDP	109.5	10	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.0	31	
7.1.3	ICTs & business model creation†	60.9	45	
7.1.4	ICTs & organizational model creation†	59.7	42	
7.2	Creative goods & services	41.6	12	●
7.2.1	Cultural & creative services exports, % total trade	0.6	31	
7.2.2	National feature films/mn pop. 15–69	5.6	35	
7.2.3	Global ent. & media output/th pop. 15–69	17.0	27	
7.2.4	Printing & publishing output manufactures, % ④	1.3	57	
7.2.5	Creative goods exports, % total trade	10.1	4	●
7.3	Online creativity	48.6	24	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	18.9	32	
7.3.2	Country-code TLDs/th pop. 15–69	62.5	15	●
7.3.3	Wikipedia edits/pop. 15–69	3,275.3	41	
7.3.4	Video uploads on YouTube/pop. 15–69	89.0	16	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
④ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Denmark

Key indicators

Population (millions)	5.6
GDP (US$ billions)	340.8
GDP per capita, PPP$	38,916.8
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**57.7**	**10**	
Innovation Output Sub-Index		49.5	12	
Innovation Input Sub-Index		65.9	8	
Innovation Efficiency Ratio		0.8	49	
Global Innovation Index 2014 (out of 143)		57.5	8	
1	**Institutions**	**93.1**	**4**	●
1.1	Political environment	91.1	7	
1.1.1	Political stability*	87.6	21	
1.1.2	Government effectiveness*	94.7	3	●
1.2	Regulatory environment	98.3	2	●
1.2.1	Regulatory quality*	95.8	6	●
1.2.2	Rule of law*	97.5	4	●
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	90.0	7	
1.3.1	Ease of starting a business*	93.4	22	
1.3.2	Ease of resolving insolvency*	84.6	8	
1.3.3	Ease of paying taxes*	91.9	12	
2	**Human capital & research**	**62.4**	**3**	●
2.1	Education	62.9	9	
2.1.1	Expenditure on education, % GDP	8.7	3	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	30.1	24	
2.1.3	School life expectancy, years	18.7	4	●
2.1.4	PISA scales in reading, maths, & science	498.2	22	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	46.5	27	
2.2.1	Tertiary enrolment, % gross	79.6	12	
2.2.2	Graduates in science & engineering, %	21.2	46	○
2.2.3	Tertiary inbound mobility, %	8.1	22	
2.3	Research & development (R&D)	77.9	3	●
2.3.1	Researchers, FTE/mn pop.	7,271.3	2	●
2.3.2	Gross expenditure on R&D, % GDP	3.1	7	
2.3.3	QS university ranking, average score top 3*	72.7	14	
3	**Infrastructure**	**55.7**	**21**	
3.1	Information & communication technologies (ICTs)	74.0	21	
3.1.1	ICT access*	88.0	11	
3.1.2	ICT use*	87.1	1	●
3.1.3	Government's online service*	66.1	35	
3.1.4	E-participation*	54.9	54	○
3.2	General infrastructure	38.6	44	
3.2.1	Electricity output, kWh/cap	6,164.2	31	
3.2.2	Logistics performance*	82.7	17	
3.2.3	Gross capital formation, % GDP	17.3	115	○
3.3	Ecological sustainability	54.5	17	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	10.3	22	
3.3.2	Environmental performance*	76.9	13	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	3.3	27	
4	**Market sophistication**	**68.4**	**7**	
4.1	Credit	67.9	5	●
4.1.1	Ease of getting credit*	70.0	22	
4.1.2	Domestic credit to private sector, % GDP	199.6	3	●
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	52.5	22	
4.2.1	Ease of protecting investors*	67.5	17	
4.2.2	Market capitalization, % GDP	69.8	23	
4.2.3	Total value of stocks traded, % GDP	32.7	26	
4.2.4	Venture capital deals/tr PPP$ GDP	0.5	8	
4.3	Trade & competition	84.6	30	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	72.6	43	
5	**Business sophistication**	**49.7**	**17**	
5.1	Knowledge workers	70.3	6	●
5.1.1	Knowledge-intensive employment, %	45.5	10	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	2.0	8	
5.1.4	GERD financed by business, %	59.8	13	
5.1.5	Females employed w/advanced degrees, % total	20.6	21	
5.2	Innovation linkages	40.3	42	
5.2.1	University/industry research collaboration†	65.0	19	
5.2.2	State of cluster development†	55.2	32	
5.2.3	GERD financed by abroad, %	7.2	55	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	31	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	1.1	15	
5.3	Knowledge absorption	38.5	46	
5.3.1	Royalty & license fees payments, % total trade	1.0	30	
5.3.2	High-tech imports less re-imports, % total trade	6.2	79	○
5.3.3	Comm., computer & info. services imp., % total trade	2.0	16	
5.3.4	FDI net inflows, % GDP	0.5	123	○
6	**Knowledge & technology outputs**	**46.1**	**16**	
6.1	Knowledge creation	45.3	17	
6.1.1	Domestic resident patent app./bn PPP$ GDP	5.5	17	
6.1.2	PCT resident patent app./bn PPP$ GDP	5.2	10	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.6	34	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	63.4	2	●
6.1.5	Citable documents H index	476.0	14	
6.2	Knowledge impact	46.2	33	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.9	76	○
6.2.2	New businesses/th pop. 15–64	4.4	28	
6.2.3	Computer software spending, % GDP	0.6	12	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	6.3	55	
6.2.5	High- & medium-high-tech manufactures, %	44.3	10	
6.3	Knowledge diffusion	46.7	24	
6.3.1	Royalty & license fees receipts, % total trade	1.4	13	
6.3.2	High-tech exports less re-exports, % total trade	5.9	27	
6.3.3	Comm., computer & info. services exp., % total trade	1.8	46	
6.3.4	FDI net outflows, % GDP	3.2	20	
7	**Creative outputs**	**53.0**	**13**	
7.1	Intangible assets	50.1	48	
7.1.1	Domestic res trademark app./bn PPP$ GDP	47.4	55	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	2.2	10	
7.1.3	ICTs & business model creation†	61.7	43	
7.1.4	ICTs & organizational model creation†	61.5	31	
7.2	Creative goods & services	40.2	16	
7.2.1	Cultural & creative services exports, % total trade	0.7	29	
7.2.2	National feature films/mn pop. 15–69	17.4	10	
7.2.3	Global ent. & media output/th pop. 15–69	61.5	7	
7.2.4	Printing & publishing output manufactures, %	1.4	53	○
7.2.5	Creative goods exports, % total trade	1.6	30	
7.3	Online creativity	71.7	8	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	55.1	17	
7.3.2	Country-code TLDs/th pop. 15–69	100.0	1	●
7.3.3	Wikipedia edits/pop. 15–69	5,288.9	23	
7.3.4	Video uploads on YouTube/pop. 15–69	92.5	8	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Dominican Republic

Key indicators

Population (millions)	10.5
GDP (US$ billions)	64.1
GDP per capita, PPP$	10,325.5
Income group	Upper-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**30.6**	**89**	
Innovation Output Sub-Index		23.3	98	
Innovation Input Sub-Index		37.9	88	
Innovation Efficiency Ratio		0.6	108	
Global Innovation Index 2014 (out of 143)		32.3	83	
1	**Institutions**	**53.3**	**93**	
1.1	Political environment	48.4	74	
1.1.1	Political stability*	68.8	54	●
1.1.2	Government effectiveness*	28.1	100	
1.2	Regulatory environment	51.6	109	
1.2.1	Regulatory quality*	45.0	80	
1.2.2	Rule of law*	33.5	93	
1.2.3	Cost of redundancy dismissal, salary weeks	26.2	114	
1.3	Business environment	59.9	102	
1.3.1	Ease of starting a business*	81.6	92	
1.3.2	Ease of resolving insolvency*	23.8	133	○
1.3.3	Ease of paying taxes*	74.2	62	
2	**Human capital & research**	**18.8**	**107**	
2.1	Education	29.4	122	
2.1.1	Expenditure on education, % GDP	3.8	91	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	8.5	105	○
2.1.3	School life expectancy, years	13.1	77	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	29.2	105	
2.2	Tertiary education	27.1	82	
2.2.1	Tertiary enrolment, % gross	46.4	57	●
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	3.5	50	●
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**35.8**	**84**	
3.1	Information & communication technologies (ICTs)	35.0	95	
3.1.1	ICT access*	41.5	97	
3.1.2	ICT use*	26.5	78	
3.1.3	Government's online service*	38.6	85	
3.1.4	E-participation*	33.3	92	
3.2	General infrastructure	26.4	91	
3.2.1	Electricity output, kWh/cap	1,650.4	82	
3.2.2	Logistics performance*	35.7	66	
3.2.3	Gross capital formation, % GDP	22.4	61	●
3.3	Ecological sustainability	45.9	41	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	13.3	9	●
3.3.2	Environmental performance*	53.2	67	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	109	
4	**Market sophistication**	**49.6**	**57**	●
4.1	Credit	21.8	106	
4.1.1	Ease of getting credit*	45.0	80	
4.1.2	Domestic credit to private sector, % GDP	24.0	111	
4.1.3	Microfinance gross loans, % GDP	1.2	36	●
4.2	Investment	54.2	17	
4.2.1	Ease of protecting investors*	54.2	75	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	72.7	87	
4.3.1	Applied tariff rate, weighted mean, %	6.1	91	
4.3.2	Intensity of local competition†	66.6	69	
5	**Business sophistication**	**32.1**	**79**	
5.1	Knowledge workers	46.9	42	
5.1.1	Knowledge-intensive employment, %	17.2	84	
5.1.2	Firms offering formal training, % firms	57.0	15	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	12.5	50	
5.2	Innovation linkages	26.9	92	
5.2.1	University/industry research collaboration†	37.6	91	
5.2.2	State of cluster development†	44.7	77	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	74	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	86	
5.3	Knowledge absorption	22.6	129	○
5.3.1	Royalty & license fees payments, % total trade	0.4	60	
5.3.2	High-tech imports less re-imports, % total trade	5.5	89	
5.3.3	Comm., computer & info. services imp., % total trade	0.4	111	○
5.3.4	FDI net inflows, % GDP	2.6	69	
6	**Knowledge & technology outputs**	**17.1**	**119**	
6.1	Knowledge creation	0.8	140	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.1	103	○
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	90	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.0	59	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	0.4	138	○
6.1.5	Citable documents H index	43.0	122	○
6.2	Knowledge impact	28.8	108	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.2	93	
6.2.2	New businesses/th pop. 15–64	1.0	67	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.6	103	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	21.8	105	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	1.1	61	
6.3.3	Comm., computer & info. services exp., % total trade	1.3	65	
6.3.4	FDI net outflows, % GDP	(0.6)	118	○
7	**Creative outputs**	**29.4**	**83**	
7.1	Intangible assets	46.5	63	
7.1.1	Domestic res trademark app./bn PPP$ GDP	41.4	59	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	59.2	53	●
7.1.4	ICTs & organizational model creation†	58.0	48	●
7.2	Creative goods & services	20.5	64	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	0.9	78	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	1.2	36	●
7.3	Online creativity	4.3	94	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.8	76	
7.3.2	Country-code TLDs/th pop. 15–69	1.5	81	
7.3.3	Wikipedia edits/pop. 15–69	1,155.1	72	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Ecuador

Key indicators

Population (millions)	16.0
GDP (US$ billions)	100.8
GDP per capita, PPP$	10,492.3
Income group	Upper-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**26.9**	**119**	
Innovation Output Sub-Index		18.1	124	
Innovation Input Sub-Index		35.6	99	
Innovation Efficiency Ratio		0.5	127	○
Global Innovation Index 2014 (out of 143)		27.5	115	
1	**Institutions**	**44.5**	**124**	
1.1	Political environment	43.8	84	
1.1.1	Political stability*	59.3	78	
1.1.2	Government effectiveness*	28.3	98	
1.2	Regulatory environment	37.7	131	○
1.2.1	Regulatory quality*	22.7	126	○
1.2.2	Rule of law*	22.3	122	
1.2.3	Cost of redundancy dismissal, salary weeks	31.8	131	○
1.3	Business environment	52.2	131	○
1.3.1	Ease of starting a business*	65.3	129	○
1.3.2	Ease of resolving insolvency*	28.4	128	○
1.3.3	Ease of paying taxes*	62.8	105	
2	**Human capital & research**	**22.3**	**98**	
2.1	Education	42.9	76	
2.1.1	Expenditure on education, % GDP	4.4	76	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	19.0	62	
2.1.3	School life expectancy, years	14.2	56	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	14.1	54	
2.2	Tertiary education	20.6	101	
2.2.1	Tertiary enrolment, % gross	40.5	66	
2.2.2	Graduates in science & engineering, %◴	12.8	91	○
2.2.3	Tertiary inbound mobility, %	0.6	90	
2.3	Research & development (R&D)	3.4	91	
2.3.1	Researchers, FTE/mn pop.◴	179.5	69	
2.3.2	Gross expenditure on R&D, % GDP◴	0.4	74	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**39.0**	**72**	
3.1	Information & communication technologies (ICTs)	43.6	77	
3.1.1	ICT access*	51.6	76	
3.1.2	ICT use*	25.8	81	
3.1.3	Government's online service*	48.0	66	
3.1.4	E-participation*	49.0	64	
3.2	General infrastructure	30.9	67	
3.2.1	Electricity output, kWh/cap	1,475.0	88	
3.2.2	Logistics performance*	28.0	81	
3.2.3	Gross capital formation, % GDP	28.5	29	●
3.3	Ecological sustainability	42.3	50	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.5	29	●
3.3.2	Environmental performance*	58.5	50	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.2	59	
4	**Market sophistication**	**47.7**	**66**	
4.1	Credit	33.6	57	●
4.1.1	Ease of getting credit*	45.0	80	
4.1.2	Domestic credit to private sector, % GDP	26.7	105	
4.1.3	Microfinance gross loans, % GDP	4.0	14	●
4.2	Investment	24.4	129	○
4.2.1	Ease of protecting investors*	46.7	102	
4.2.2	Market capitalization, % GDP	6.7	94	
4.2.3	Total value of stocks traded, % GDP	0.2	96	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	85.2	27	●
4.3.1	Applied tariff rate, weighted mean, %	4.3	71	
4.3.2	Intensity of local competition†	n/a	n/a	
5	**Business sophistication**	**24.7**	**123**	
5.1	Knowledge workers	35.5	79	
5.1.1	Knowledge-intensive employment, %	14.4	96	
5.1.2	Firms offering formal training, % firms◴	65.9	4	●
5.1.3	GERD performed by business, % of GDP◴	0.2	48	
5.1.4	GERD financed by business, %◴	0.4	87	○
5.1.5	Females employed w/advanced degrees, % total	10.4	61	
5.2	Innovation linkages	5.1	139	○
5.2.1	University/industry research collaboration†	n/a	n/a	
5.2.2	State of cluster development†	n/a	n/a	
5.2.3	GERD financed by abroad, %◴	4.5	67	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	79	
5.3	Knowledge absorption	33.4	68	
5.3.1	Royalty & license fees payments, % total trade	0.4	61	
5.3.2	High-tech imports less re-imports, % total trade	9.4	43	●
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	0.8	119	
6	**Knowledge & technology outputs**	**13.4**	**127**	○
6.1	Knowledge creation	2.8	129	○
6.1.1	Domestic resident patent app./bn PPP$ GDP◴	0.0	111	○
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	82	
6.1.3	Domestic res utility model app./bn PPP$ GDP◴	0.1	51	
6.1.4	Scientific & technical articles/bn PPP$ GDP	3.0	115	
6.1.5	Citable documents H index	92.0	76	
6.2	Knowledge impact	36.2	78	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.9	48	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.2	66	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	8.0	47	●
6.2.5	High- & medium-high-tech manufactures, %◴	14.0	69	
6.3	Knowledge diffusion	1.2	136	○
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.3	91	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**22.8**	**109**	
7.1	Intangible assets	35.2	115	
7.1.1	Domestic res trademark app./bn PPP$ GDP◴	63.9	34	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	n/a	n/a	
7.1.4	ICTs & organizational model creation†	n/a	n/a	
7.2	Creative goods & services	15.1	82	
7.2.1	Cultural & creative services exports, % total trade	0.4	37	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	1.6	44	
7.2.5	Creative goods exports, % total trade	0.1	104	
7.3	Online creativity	5.8	89	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.5	79	
7.3.2	Country-code TLDs/th pop. 15–69	1.5	80	
7.3.3	Wikipedia edits/pop. 15–69	1,804.1	58	●
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Egypt

Key indicators

Population (millions)	83.4
GDP (US$ billions)	286.4
GDP per capita, PPP$	6,695.8
Income group	Lower-middle income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**28.9**	**100**	
Innovation Output Sub-Index		23.4	96	
Innovation Input Sub-Index		34.4	108	
Innovation Efficiency Ratio		0.7	83	
Global Innovation Index 2014 (out of 143)		30.0	99	
1	**Institutions**	**39.5**	**131**	○
1.1	Political environment	20.7	134	○
1.1.1	Political stability*	24.1	135	○
1.1.2	Government effectiveness*	17.3	123	
1.2	Regulatory environment	36.6	132	○
1.2.1	Regulatory quality*	29.3	116	
1.2.2	Rule of law*	31.6	98	
1.2.3	Cost of redundancy dismissal, salary weeks	36.9	133	○
1.3	Business environment	61.1	99	
1.3.1	Ease of starting a business*	88.1	61	
1.3.2	Ease of resolving insolvency*	36.2	110	
1.3.3	Ease of paying taxes*	58.8	115	
2	**Human capital & research**	**27.9**	**72**	
2.1	Education	50.7	50	●
2.1.1	Expenditure on education, % GDP◴	3.8	92	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	13.5	69	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	12.1	41	●
2.2	Tertiary education	16.5	110	
2.2.1	Tertiary enrolment, % gross	30.1	76	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %◴	1.9	68	
2.3	Research & development (R&D)	16.4	50	●
2.3.1	Researchers, FTE/mn pop.	466.0	60	
2.3.2	Gross expenditure on R&D, % GDP	0.7	51	
2.3.3	QS university ranking, average score top 3*	27.9	47	●
3	**Infrastructure**	**37.2**	**77**	
3.1	Information & communication technologies (ICTs)	48.4	65	
3.1.1	ICT access*	50.9	78	
3.1.2	ICT use*	28.7	74	
3.1.3	Government's online service*	59.1	51	●
3.1.4	E-participation*	54.9	54	
3.2	General infrastructure	19.7	119	
3.2.1	Electricity output, kWh/cap	2,036.2	78	
3.2.2	Logistics performance*	41.0	60	
3.2.3	Gross capital formation, % GDP	14.5	126	○
3.3	Ecological sustainability	43.5	49	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.8	26	●
3.3.2	Environmental performance*	61.1	47	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.9	69	
4	**Market sophistication**	**35.9**	**128**	○
4.1	Credit	19.5	116	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	27.8	103	
4.1.3	Microfinance gross loans, % GDP	0.1	72	
4.2	Investment	27.0	107	
4.2.1	Ease of protecting investors*	44.2	117	
4.2.2	Market capitalization, % GDP	22.1	65	
4.2.3	Total value of stocks traded, % GDP	7.7	44	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	61.3	123	
4.3.1	Applied tariff rate, weighted mean, %◴	8.1	108	
4.3.2	Intensity of local competition†	50.8	126	○
5	**Business sophistication**	**31.6**	**84**	
5.1	Knowledge workers	37.2	71	
5.1.1	Knowledge-intensive employment, %	36.3	30	●
5.1.2	Firms offering formal training, % firms◴	21.7	88	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	5.5	75	
5.2	Innovation linkages	30.2	78	
5.2.1	University/industry research collaboration†	23.8	127	○
5.2.2	State of cluster development†	54.5	35	●
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	42	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	106	○
5.3	Knowledge absorption	27.5	105	
5.3.1	Royalty & license fees payments, % total trade◴	0.6	50	
5.3.2	High-tech imports less re-imports, % total trade	6.5	72	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.8	72	
5.3.4	FDI net inflows, % GDP	2.0	81	
6	**Knowledge & technology outputs**	**21.7**	**97**	
6.1	Knowledge creation	8.5	81	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.7	69	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	78	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	9.2	69	
6.1.5	Citable documents H index	148.0	49	●
6.2	Knowledge impact	30.4	102	
6.2.1	Growth rate of PPP$ GDP/worker, %	(0.1)	101	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.2	65	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	2.3	88	
6.2.5	High- & medium-high-tech manufactures, %◴	21.5	53	
6.3	Knowledge diffusion	26.3	77	
6.3.1	Royalty & license fees receipts, % total trade◴	0.3	29	●
6.3.2	High-tech exports less re-exports, % total trade	0.1	103	
6.3.3	Comm., computer & info. services exp., % total trade◴	1.9	45	●
6.3.4	FDI net outflows, % GDP◴	0.1	93	
7	**Creative outputs**	**25.1**	**98**	
7.1	Intangible assets	37.4	105	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.0	63	○
7.1.3	ICTs & business model creation†	46.1	104	
7.1.4	ICTs & organizational model creation†	47.1	93	
7.2	Creative goods & services	8.7	101	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	0.6	88	
7.2.3	Global ent. & media output/th pop. 15–69	0.8	54	○
7.2.4	Printing & publishing output manufactures, %◴	0.6	86	○
7.2.5	Creative goods exports, % total trade	0.6	54	
7.3	Online creativity	16.8	69	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.5	96	
7.3.2	Country-code TLDs/th pop. 15–69	0.0	130	○
7.3.3	Wikipedia edits/pop. 15–69	439.1	94	
7.3.4	Video uploads on YouTube/pop. 15–69	62.6	61	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

El Salvador

Key indicators

Population (millions)	6.4
GDP (US$ billions)	25.3
GDP per capita, PPP$	7,719.9
Income group	Lower-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**29.3**	**99**	
Innovation Output Sub-Index		22.4	104	
Innovation Input Sub-Index		36.2	95	
Innovation Efficiency Ratio		0.6	106	
Global Innovation Index 2014 (out of 143)		29.1	103	
1	**Institutions**	**55.5**	**86**	
1.1	Political environment	50.5	69	
1.1.1	Political stability*	63.1	69	
1.1.2	Government effectiveness*	37.9	79	
1.2	Regulatory environment	56.7	97	
1.2.1	Regulatory quality*	56.0	60	
1.2.2	Rule of law*	29.7	104	
1.2.3	Cost of redundancy dismissal, salary weeks	22.9	105	
1.3	Business environment	59.4	107	
1.3.1	Ease of starting a business*	79.9	99	
1.3.2	Ease of resolving insolvency*	46.0	74	
1.3.3	Ease of paying taxes*	52.3	123	
2	**Human capital & research**	**17.2**	**116**	
2.1	Education	24.4	129	○
2.1.1	Expenditure on education, % GDP	3.4	101	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap[d]	11.3	94	
2.1.3	School life expectancy, years	12.3	90	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	38.0	117	○
2.2	Tertiary education	26.9	83	
2.2.1	Tertiary enrolment, % gross	25.5	84	
2.2.2	Graduates in science & engineering, %	21.5	42	
2.2.3	Tertiary inbound mobility, %	0.4	97	
2.3	Research & development (R&D)	0.2	125	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP[d]	0.0	117	○
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**32.4**	**92**	
3.1	Information & communication technologies (ICTs)	43.7	76	
3.1.1	ICT access*	47.6	83	
3.1.2	ICT use*	12.7	106	
3.1.3	Government's online service*	53.5	59	
3.1.4	E-participation*	60.8	45	●
3.2	General infrastructure	18.6	125	○
3.2.1	Electricity output, kWh/cap	931.1	93	
3.2.2	Logistics performance*	40.8	62	
3.2.3	Gross capital formation, % GDP	14.8	124	○
3.3	Ecological sustainability	35.0	80	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.5	29	●
3.3.2	Environmental performance*	43.8	99	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	106	
4	**Market sophistication**	**44.1**	**88**	
4.1	Credit	27.0	82	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	42.7	79	
4.1.3	Microfinance gross loans, % GDP	1.5	32	●
4.2	Investment	27.8	106	
4.2.1	Ease of protecting investors*	41.7	123	○
4.2.2	Market capitalization, % GDP	45.1	43	
4.2.3	Total value of stocks traded, % GDP	0.2	89	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	77.5	64	
4.3.1	Applied tariff rate, weighted mean, %	2.4	50	
4.3.2	Intensity of local competition†	63.4	86	
5	**Business sophistication**	**31.7**	**82**	
5.1	Knowledge workers	32.4	87	
5.1.1	Knowledge-intensive employment, %	12.1	99	
5.1.2	Firms offering formal training, % firms[d]	61.0	10	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %[d]	2.8	81	○
5.1.5	Females employed w/advanced degrees, % total	0.0	87	○
5.2	Innovation linkages	31.8	65	
5.2.1	University/industry research collaboration†	46.8	51	
5.2.2	State of cluster development†	58.1	28	●
5.2.3	GERD financed by abroad, %[d]	9.2	45	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP[d]	0.0	72	
5.3	Knowledge absorption	30.9	87	
5.3.1	Royalty & license fees payments, % total trade	0.8	41	●
5.3.2	High-tech imports less re-imports, % total trade	9.7	34	●
5.3.3	Comm., computer & info. services imp., % total trade	0.6	82	
5.3.4	FDI net inflows, % GDP	0.8	117	
6	**Knowledge & technology outputs**	**12.2**	**133**	○
6.1	Knowledge creation	1.4	139	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	73	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	0.9	136	○
6.1.5	Citable documents H index	36.0	130	○
6.2	Knowledge impact	5.7	130	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	0.5	90	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	4.0	69	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	29.4	61	
6.3.1	Royalty & license fees receipts, % total trade	0.3	27	●
6.3.2	High-tech exports less re-exports, % total trade	2.6	46	●
6.3.3	Comm., computer & info. services exp., % total trade	1.7	49	
6.3.4	FDI net outflows, % GDP	0.2	79	
7	**Creative outputs**	**32.7**	**67**	
7.1	Intangible assets	56.3	21	●
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	57.6	63	
7.1.4	ICTs & organizational model creation†	55.0	59	
7.2	Creative goods & services	14.7	83	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69[d]	0.3	101	○
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.8	42	●
7.3	Online creativity	3.5	99	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.8	77	
7.3.2	Country-code TLDs/th pop. 15–69	0.8	91	
7.3.3	Wikipedia edits/pop. 15–69	921.3	79	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[d] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Estonia

Key indicators

Population (millions)	1.3
GDP (US$ billions)	26.0
GDP per capita, PPP$	23,213.4
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**52.8**	**23**	
Innovation Output Sub-Index		48.8	14	
Innovation Input Sub-Index		56.8	26	
Innovation Efficiency Ratio		0.9	17	
Global Innovation Index 2014 (out of 143)		51.5	24	
1	**Institutions**	**80.8**	**22**	
1.1	Political environment	75.0	33	
1.1.1	Political stability*	82.1	37	
1.1.2	Government effectiveness*	68.0	34	
1.2	Regulatory environment	86.3	21	
1.2.1	Regulatory quality*	85.9	18	
1.2.2	Rule of law*	78.6	24	
1.2.3	Cost of redundancy dismissal, salary weeks	12.9	49	
1.3	Business environment	81.0	23	
1.3.1	Ease of starting a business*	93.3	23	
1.3.2	Ease of resolving insolvency*	64.9	35	
1.3.3	Ease of paying taxes*	84.9	27	
2	**Human capital & research**	**44.2**	**30**	
2.1	Education	57.1	17	
2.1.1	Expenditure on education, % GDP	5.2	49	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	27.5	30	
2.1.3	School life expectancy, years	16.5	14	
2.1.4	PISA scales in reading, maths, & science	526.1	7	
2.1.5	Pupil-teacher ratio, secondary	8.4	11	●
2.2	Tertiary education	40.7	43	
2.2.1	Tertiary enrolment, % gross	76.7	16	
2.2.2	Graduates in science & engineering, %	22.1	37	
2.2.3	Tertiary inbound mobility, %	2.3	61	○
2.3	Research & development (R&D)	34.8	30	
2.3.1	Researchers, FTE/mn pop.	3,423.6	25	
2.3.2	Gross expenditure on R&D, % GDP	1.8	20	
2.3.3	QS university ranking, average score top 3*	21.5	52	
3	**Infrastructure**	**60.9**	**10**	●
3.1	Information & communication technologies (ICTs)	74.9	19	
3.1.1	ICT access*	78.2	25	
3.1.2	ICT use*	67.7	17	
3.1.3	Government's online service*	77.2	18	
3.1.4	E-participation*	76.5	22	
3.2	General infrastructure	50.6	16	
3.2.1	Electricity output, kWh/cap	9,918.7	13	
3.2.2	Logistics performance*	60.4	38	
3.2.3	Gross capital formation, % GDP	29.1	25	
3.3	Ecological sustainability	57.2	11	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.3	104	○
3.3.2	Environmental performance*	74.7	20	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	12.8	1	●
4	**Market sophistication**	**54.6**	**37**	
4.1	Credit	46.7	30	
4.1.1	Ease of getting credit*	70.0	22	
4.1.2	Domestic credit to private sector, % GDP	73.7	43	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	30.9	94	○
4.2.1	Ease of protecting investors*	58.3	54	
4.2.2	Market capitalization, % GDP	10.3	88	○
4.2.3	Total value of stocks traded, % GDP	0.8	70	○
4.2.4	Venture capital deals/tr PPP$ GDP	0.3	14	
4.3	Trade & competition	86.2	19	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	75.8	27	
5	**Business sophistication**	**43.4**	**33**	
5.1	Knowledge workers	54.0	31	
5.1.1	Knowledge-intensive employment, %	41.8	21	
5.1.2	Firms offering formal training, % firms	35.0	52	
5.1.3	GERD performed by business, % of GDP	0.8	24	
5.1.4	GERD financed by business, %	41.3	35	
5.1.5	Females employed w/advanced degrees, % total	25.5	7	●
5.2	Innovation linkages	31.3	70	
5.2.1	University/industry research collaboration†	55.9	33	
5.2.2	State of cluster development†	45.6	73	○
5.2.3	GERD financed by abroad, %	10.3	42	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	48	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.3	28	
5.3	Knowledge absorption	45.0	25	
5.3.1	Royalty & license fees payments, % total trade	0.3	80	○
5.3.2	High-tech imports less re-imports, % total trade	11.8	24	
5.3.3	Comm., computer & info. services imp., % total trade	2.0	14	
5.3.4	FDI net inflows, % GDP	3.7	42	
6	**Knowledge & technology outputs**	**42.1**	**19**	
6.1	Knowledge creation	31.9	32	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.7	68	○
6.1.2	PCT resident patent app./bn PPP$ GDP	0.8	31	
6.1.3	Domestic res utility model app./bn PPP$ GDP	2.8	12	
6.1.4	Scientific & technical articles/bn PPP$ GDP	48.5	9	●
6.1.5	Citable documents H index	148.0	49	
6.2	Knowledge impact	55.7	9	●
6.2.1	Growth rate of PPP$ GDP/worker, %	1.0	71	○
6.2.2	New businesses/th pop. 15–64 ◴	7.9	15	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	27.2	11	●
6.2.5	High- & medium-high-tech manufactures, %	38.2	23	
6.3	Knowledge diffusion	38.6	37	
6.3.1	Royalty & license fees receipts, % total trade	0.1	70	○
6.3.2	High-tech exports less re-exports, % total trade	11.6	19	
6.3.3	Comm., computer & info. services exp., % total trade	2.6	25	
6.3.4	FDI net outflows, % GDP	1.5	44	
7	**Creative outputs**	**55.6**	**9**	●
7.1	Intangible assets	65.5	7	●
7.1.1	Domestic res trademark app./bn PPP$ GDP	81.0	20	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	2.3	9	
7.1.3	ICTs & business model creation†	78.6	3	●
7.1.4	ICTs & organizational model creation†	78.4	2	●
7.2	Creative goods & services	41.9	11	●
7.2.1	Cultural & creative services exports, % total trade	0.8	20	
7.2.2	National feature films/mn pop. 15–69	19.6	8	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	2.2	26	
7.2.5	Creative goods exports, % total trade	1.3	35	
7.3	Online creativity	49.5	22	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	10.8	43	
7.3.2	Country-code TLDs/th pop. 15–69	36.9	22	
7.3.3	Wikipedia edits/pop. 15–69	7,671.3	11	●
7.3.4	Video uploads on YouTube/pop. 15–69	93.4	7	●

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Ethiopia

Key indicators

Population (millions)	96.5
GDP (US$ billions)	52.3
GDP per capita, PPP$	1,455.4
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**24.2**	**127**	
Innovation Output Sub-Index		20.3	111	
Innovation Input Sub-Index		28.0	132	
Innovation Efficiency Ratio		0.7	66	●
Global Innovation Index 2014 (out of 143)		25.4	126	
1	**Institutions**	**46.5**	**117**	
1.1	Political environment	28.5	124	
1.1.1	Political stability*	29.7	133	
1.1.2	Government effectiveness*	27.4	101	
1.2	Regulatory environment	51.1	111	
1.2.1	Regulatory quality*	17.6	134	
1.2.2	Rule of law*	31.1	100	
1.2.3	Cost of redundancy dismissal, salary weeks	19.1	87	
1.3	Business environment	59.8	103	
1.3.1	Ease of starting a business*	63.2	132	
1.3.2	Ease of resolving insolvency*	47.2	69	●
1.3.3	Ease of paying taxes*	69.1	88	
2	**Human capital & research**	**13.4**	**132**	
2.1	Education	15.7	139	○
2.1.1	Expenditure on education, % GDP◴	4.7	66	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	10.4	97	
2.1.3	School life expectancy, years◴	6.6	131	○
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	38.8	118	○
2.2	Tertiary education	19.4	103	
2.2.1	Tertiary enrolment, % gross◴	2.8	131	○
2.2.2	Graduates in science & engineering, %◴	15.2	82	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	4.9	83	
2.3.1	Researchers, FTE/mn pop.	46.1	92	
2.3.2	Gross expenditure on R&D, % GDP	0.6	54	●
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**23.9**	**119**	
3.1	Information & communication technologies (ICTs)	23.1	116	
3.1.1	ICT access*	18.7	135	○
3.1.2	ICT use*	2.4	129	
3.1.3	Government's online service*	45.7	71	●
3.1.4	E-participation*	25.5	110	
3.2	General infrastructure	29.4	75	
3.2.1	Electricity output, kWh/cap	73.0	122	○
3.2.2	Logistics performance*	22.1	98	
3.2.3	Gross capital formation, % GDP	30.1	21	●
3.3	Ecological sustainability	19.2	136	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	2.2	119	○
3.3.2	Environmental performance*	39.4	109	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.0	135	○
4	**Market sophistication**	**31.9**	**137**	○
4.1	Credit	6.6	136	
4.1.1	Ease of getting credit*	15.0	129	
4.1.2	Domestic credit to private sector, % GDP◴	17.7	120	
4.1.3	Microfinance gross loans, % GDP	0.0	74	
4.2	Investment	28.0	104	
4.2.1	Ease of protecting investors*	41.7	123	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	64	
4.3	Trade & competition	61.2	124	
4.3.1	Applied tariff rate, weighted mean, %	10.3	123	
4.3.2	Intensity of local competition†	58.8	109	
5	**Business sophistication**	**24.6**	**125**	
5.1	Knowledge workers	14.2	131	
5.1.1	Knowledge-intensive employment, %	3.8	112	
5.1.2	Firms offering formal training, % firms◴	30.0	66	
5.1.3	GERD performed by business, % of GDP	0.0	82	
5.1.4	GERD financed by business, %	0.7	86	
5.1.5	Females employed w/advanced degrees, % total◴	6.0	74	
5.2	Innovation linkages	22.5	114	
5.2.1	University/industry research collaboration†	41.0	75	
5.2.2	State of cluster development†	33.3	121	
5.2.3	GERD financed by abroad, %	2.1	80	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	37.0	53	●
5.3.1	Royalty & license fees payments, % total trade◴	0.0	114	
5.3.2	High-tech imports less re-imports, % total trade	9.7	36	●
5.3.3	Comm., computer & info. services imp., % total trade◴	1.6	34	●
5.3.4	FDI net inflows, % GDP	2.0	82	
6	**Knowledge & technology outputs**	**17.3**	**118**	
6.1	Knowledge creation	8.8	79	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	6.9	81	
6.1.5	Citable documents H index	82.0	86	
6.2	Knowledge impact	33.6	92	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.6	20	●
6.2.2	New businesses/th pop. 15–64◴	0.0	105	○
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.4	132	
6.2.5	High- & medium-high-tech manufactures, %◴	10.9	76	
6.3	Knowledge diffusion	9.4	131	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	99	
6.3.2	High-tech exports less re-exports, % total trade	0.1	112	
6.3.3	Comm., computer & info. services exp., % total trade◴	1.7	55	●
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**23.3**	**106**	
7.1	Intangible assets	37.6	103	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	39.1	121	
7.1.4	ICTs & organizational model creation†	36.1	124	
7.2	Creative goods & services	18.1	73	
7.2.1	Cultural & creative services exports, % total trade	0.0	82	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	2.7	13	●
7.2.5	Creative goods exports, % total trade	0.1	106	
7.3	Online creativity	0.0	140	○
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.0	139	○
7.3.2	Country-code TLDs/th pop. 15–69	0.0	134	
7.3.3	Wikipedia edits/pop. 15–69	23.9	131	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Fiji

Key indicators

Population (millions)	0.9
GDP (US$ billions)	4.2
GDP per capita, PPP$	5,253.6
Income group	Upper-middle income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**27.3**	**115**	
Innovation Output Sub-Index		12.0	137	○
Innovation Input Sub-Index		42.6	64	
Innovation Efficiency Ratio		0.3	140	○
Global Innovation Index 2014 (out of 143)		30.4	95	
1	**Institutions**	**54.4**	**88**	
1.1	Political environment	39.5	102	
1.1.1	Political stability*	63.5	67	
1.1.2	Government effectiveness*	15.5	128	○
1.2	Regulatory environment	62.8	80	
1.2.1	Regulatory quality*	32.6	109	
1.2.2	Rule of law*	25.2	116	
1.2.3	Cost of redundancy dismissal, salary weeks	9.6	32	●
1.3	Business environment	60.7	100	
1.3.1	Ease of starting a business*	67.8	127	○
1.3.2	Ease of resolving insolvency*	43.6	85	
1.3.3	Ease of paying taxes*	70.7	84	
2	**Human capital & research**	**30.6**	**61**	
2.1	Education	35.1	100	
2.1.1	Expenditure on education, % GDP	4.2	81	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	5.8	110	○
2.1.3	School life expectancy, years◴	13.9	59	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	19.3	82	
2.2	Tertiary education	56.6	8	●
2.2.1	Tertiary enrolment, % gross◴	16.1	98	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %◴	32.9	1	●
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**32.9**	**90**	
3.1	Information & communication technologies (ICTs)	38.8	85	
3.1.1	ICT access*	46.0	85	
3.1.2	ICT use*	30.8	67	
3.1.3	Government's online service*	39.4	82	
3.1.4	E-participation*	39.2	82	
3.2	General infrastructure	23.0	110	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	19.6	103	
3.2.3	Gross capital formation, % GDP	19.6	94	
3.3	Ecological sustainability	36.9	75	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	53.1	68	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.6	76	
4	**Market sophistication**	**38.7**	**119**	○
4.1	Credit	25.4	86	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	81.4	38	●
4.1.3	Microfinance gross loans, % GDP	0.0	76	○
4.2	Investment	25.5	120	○
4.2.1	Ease of protecting investors*	47.5	97	
4.2.2	Market capitalization, % GDP	11.8	85	
4.2.3	Total value of stocks traded, % GDP	0.2	94	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	65.2	117	
4.3.1	Applied tariff rate, weighted mean, %◴	9.9	119	○
4.3.2	Intensity of local competition†	n/a	n/a	
5	**Business sophistication**	**56.5**	**8**	
5.1	Knowledge workers	51.6	34	
5.1.1	Knowledge-intensive employment, %◴	16.7	87	
5.1.2	Firms offering formal training, % firms◴	61.0	10	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	n/a	n/a	
5.2.1	University/industry research collaboration†	n/a	n/a	
5.2.2	State of cluster development†	n/a	n/a	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	61.3	5	●
5.3.1	Royalty & license fees payments, % total trade	0.1	105	
5.3.2	High-tech imports less re-imports, % total trade	23.1	3	●
5.3.3	Comm., computer & info. services imp., % total trade◴	2.0	12	●
5.3.4	FDI net inflows, % GDP	6.8	20	●
6	**Knowledge & technology outputs**	**13.4**	**128**	○
6.1	Knowledge creation	14.7	61	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	17.3	43	●
6.1.5	Citable documents H index	46.0	119	○
6.2	Knowledge impact	8.0	127	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	2.9	84	
6.2.5	High- & medium-high-tech manufactures, %◴	7.1	86	○
6.3	Knowledge diffusion	17.3	123	○
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	103	○
6.3.2	High-tech exports less re-exports, % total trade	0.1	109	○
6.3.3	Comm., computer & info. services exp., % total trade◴	0.9	81	
6.3.4	FDI net outflows, % GDP	0.1	89	
7	**Creative outputs**	**10.6**	**137**	○
7.1	Intangible assets	n/a	n/a	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	n/a	n/a	
7.1.4	ICTs & organizational model creation†	n/a	n/a	
7.2	Creative goods & services	14.6	84	
7.2.1	Cultural & creative services exports, % total trade	0.0	68	
7.2.2	National feature films/mn pop. 15–69◴	1.7	61	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	2.2	24	●
7.2.5	Creative goods exports, % total trade	0.1	86	
7.3	Online creativity	6.7	87	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.3	69	
7.3.2	Country-code TLDs/th pop. 15–69	2.7	67	
7.3.3	Wikipedia edits/pop. 15–69	1,885.4	56	●
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Finland

Key indicators

Population (millions)	5.4
GDP (US$ billions)	271.2
GDP per capita, PPP$	36,122.1
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**60.0**	**6**	
Innovation Output Sub-Index		52.0	10	
Innovation Input Sub-Index		67.9	3	●
Innovation Efficiency Ratio		0.8	41	
Global Innovation Index 2014 (out of 143)		60.7	4	
1	**Institutions**	**95.8**	**1**	●
1.1	Political environment	98.9	1	●
1.1.1	Political stability*	97.8	3	●
1.1.2	Government effectiveness*	100.0	1	●
1.2	Regulatory environment	96.9	7	
1.2.1	Regulatory quality*	97.0	4	
1.2.2	Rule of law*	98.9	3	●
1.2.3	Cost of redundancy dismissal, salary weeks	10.1	35	
1.3	Business environment	91.8	2	●
1.3.1	Ease of starting a business*	93.1	24	
1.3.2	Ease of resolving insolvency*	93.9	1	●
1.3.3	Ease of paying taxes*	88.4	20	
2	**Human capital & research**	**64.9**	**1**	●
2.1	Education	63.7	6	
2.1.1	Expenditure on education, % GDP	6.8	17	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	36.2	12	
2.1.3	School life expectancy, years	17.1	11	
2.1.4	PISA scales in reading, maths, & science	529.4	6	
2.1.5	Pupil-teacher ratio, secondary	9.3	19	
2.2	Tertiary education	54.1	11	
2.2.1	Tertiary enrolment, % gross	93.7	4	
2.2.2	Graduates in science & engineering, %	27.6	14	
2.2.3	Tertiary inbound mobility, %	5.7	32	
2.3	Research & development (R&D)	76.9	5	
2.3.1	Researchers, FTE/mn pop.	7223.3	3	●
2.3.2	Gross expenditure on R&D, % GDP	3.5	4	
2.3.3	QS university ranking, average score top 3*	61.8	17	
3	**Infrastructure**	**58.5**	**16**	
3.1	Information & communication technologies (ICTs)	76.7	17	
3.1.1	ICT access*	78.0	26	
3.1.2	ICT use*	80.9	4	
3.1.3	Government's online service*	77.2	18	
3.1.4	E-participation*	70.6	24	
3.2	General infrastructure	49.3	18	
3.2.1	Electricity output, kWh/cap	13035.8	9	
3.2.2	Logistics performance*	74.6	23	
3.2.3	Gross capital formation, % GDP	20.9	75	○
3.3	Ecological sustainability	49.5	29	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	5.2	94	○
3.3.2	Environmental performance*	75.7	18	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	6.5	16	
4	**Market sophistication**	**61.5**	**19**	
4.1	Credit	48.3	27	
4.1.1	Ease of getting credit*	65.0	34	
4.1.2	Domestic credit to private sector, % GDP	98.1	31	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	57.9	14	
4.2.1	Ease of protecting investors*	55.8	70	○
4.2.2	Market capitalization, % GDP	62.0	28	
4.2.3	Total value of stocks traded, % GDP	49.3	17	
4.2.4	Venture capital deals/tr PPP$ GDP	1.2	1	●
4.3	Trade & competition	78.3	60	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	60.0	104	○
5	**Business sophistication**	**58.8**	**4**	
5.1	Knowledge workers	74.8	3	●
5.1.1	Knowledge-intensive employment, %	44.7	11	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	2.4	4	
5.1.4	GERD financed by business, %	60.8	9	
5.1.5	Females employed w/advanced degrees, % total	25.3	8	
5.2	Innovation linkages	48.7	17	
5.2.1	University/industry research collaboration†	82.8	1	●
5.2.2	State of cluster development†	67.7	12	
5.2.3	GERD financed by abroad, %	11.5	40	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	44	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	2.5	6	
5.3	Knowledge absorption	52.7	9	
5.3.1	Royalty & license fees payments, % total trade	1.6	13	
5.3.2	High-tech imports less re-imports, % total trade	7.1	64	○
5.3.3	Comm., computer & info. services imp., % total trade	3.4	1	●
5.3.4	FDI net inflows, % GDP	-2.1	138	○
6	**Knowledge & technology outputs**	**51.9**	**11**	
6.1	Knowledge creation	57.5	8	
6.1.1	Domestic resident patent app./bn PPP$ GDP	7.3	11	
6.1.2	PCT resident patent app./bn PPP$ GDP	8.2	1	●
6.1.3	Domestic res utility model app./bn PPP$ GDP	2.0	15	
6.1.4	Scientific & technical articles/bn PPP$ GDP	54.0	5	
6.1.5	Citable documents H index	407.0	18	
6.2	Knowledge impact	44.0	42	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.6	84	○
6.2.2	New businesses/th pop. 15–64	2.3	43	
6.2.3	Computer software spending, % GDP	0.6	19	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	13.0	29	
6.2.5	High- & medium-high-tech manufactures, %	41.0	21	
6.3	Knowledge diffusion	54.2	10	
6.3.1	Royalty & license fees receipts, % total trade	3.5	4	
6.3.2	High-tech exports less re-exports, % total trade	4.5	35	
6.3.3	Comm., computer & info. services exp., % total trade	6.0	5	
6.3.4	FDI net outflows, % GDP	-0.1	111	○
7	**Creative outputs**	**52.2**	**15**	
7.1	Intangible assets	61.5	10	
7.1.1	Domestic res trademark app./bn PPP$ GDP	64.3	32	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.6	17	
7.1.3	ICTs & business model creation†	80.8	1	●
7.1.4	ICTs & organizational model creation†	79.7	1	●
7.2	Creative goods & services	28.0	45	
7.2.1	Cultural & creative services exports, % total trade	0.3	43	○
7.2.2	National feature films/mn pop. 15–69	12.7	13	
7.2.3	Global ent. & media output/th pop. 15–69	54.5	10	
7.2.4	Printing & publishing output manufactures, %	1.2	60	○
7.2.5	Creative goods exports, % total trade	0.7	46	
7.3	Online creativity	57.8	19	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	34.4	22	
7.3.2	Country-code TLDs/th pop. 15–69	39.4	16	
7.3.3	Wikipedia edits/pop. 15–69	8836.0	7	
7.3.4	Video uploads on YouTube/pop. 15–69	92.0	11	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

France

Key indicators

Population (millions)	64.6
GDP (US$ billions)	2,846.9
GDP per capita, PPP$	36,537.5
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**53.6**	**21**	
Innovation Output Sub-Index		45.9	23	
Innovation Input Sub-Index		61.3	17	
Innovation Efficiency Ratio		0.7	51	
Global Innovation Index 2014 (out of 143)		52.2	22	
1	**Institutions**	**81.7**	**21**	
1.1	Political environment	77.9	26	
1.1.1	Political stability*	74.6	48	
1.1.2	Government effectiveness*	81.1	20	
1.2	Regulatory environment	87.0	19	
1.2.1	Regulatory quality*	78.4	23	
1.2.2	Rule of law*	84.8	21	
1.2.3	Cost of redundancy dismissal, salary weeks	11.9	45	
1.3	Business environment	80.4	26	
1.3.1	Ease of starting a business*	93.0	25	
1.3.2	Ease of resolving insolvency*	75.9	20	
1.3.3	Ease of paying taxes*	72.1	75	○
2	**Human capital & research**	**55.5**	**12**	●
2.1	Education	54.5	31	
2.1.1	Expenditure on education, % GDP	5.7	37	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	28.0	28	
2.1.3	School life expectancy, years	16.0	24	
2.1.4	PISA scales in reading, maths, & science	499.8	20	
2.1.5	Pupil-teacher ratio, secondary	12.8	46	
2.2	Tertiary education	50.5	17	
2.2.1	Tertiary enrolment, % gross	58.3	42	
2.2.2	Graduates in science & engineering, %	25.4	23	
2.2.3	Tertiary inbound mobility, %	11.8	14	
2.3	Research & development (R&D)	61.4	12	●
2.3.1	Researchers, FTE/mn pop.	4124.6	18	
2.3.2	Gross expenditure on R&D, % GDP	2.3	14	
2.3.3	QS university ranking, average score top 3*	80.5	8	●
3	**Infrastructure**	**60.8**	**12**	●
3.1	Information & communication technologies (ICTs)	87.5	5	●
3.1.1	ICT access*	86.5	12	●
3.1.2	ICT use*	67.4	19	
3.1.3	Government's online service*	100.0	1	●
3.1.4	E-participation*	96.1	4	●
3.2	General infrastructure	47.8	20	
3.2.1	Electricity output, kWh/cap	8672.9	18	
3.2.2	Logistics performance*	86.0	13	●
3.2.3	Gross capital formation, % GDP	22.1	67	○
3.3	Ecological sustainability	47.1	37	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.8	53	
3.3.2	Environmental performance*	71.1	27	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	3.1	33	
4	**Market sophistication**	**59.0**	**25**	
4.1	Credit	43.0	38	
4.1.1	Ease of getting credit*	50.0	65	○
4.1.2	Domestic credit to private sector, % GDP	111.3	27	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	48.1	32	
4.2.1	Ease of protecting investors*	67.5	17	
4.2.2	Market capitalization, % GDP	67.9	25	
4.2.3	Total value of stocks traded, % GDP	41.9	19	
4.2.4	Venture capital deals/tr PPP$ GDP	0.2	15	
4.3	Trade & competition	85.9	21	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	75.1	29	
5	**Business sophistication**	**49.3**	**19**	
5.1	Knowledge workers	64.7	12	●
5.1.1	Knowledge-intensive employment, %	44.4	13	●
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	1.5	14	
5.1.4	GERD financed by business, % ◴	55.4	15	
5.1.5	Females employed w/advanced degrees, % total	19.6	23	
5.2	Innovation linkages	38.4	50	
5.2.1	University/industry research collaboration†	59.7	28	
5.2.2	State of cluster development†	55.6	30	
5.2.3	GERD financed by abroad, % ◴	7.6	53	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	43	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	1.2	14	
5.3	Knowledge absorption	44.7	29	
5.3.1	Royalty & license fees payments, % total trade	1.3	19	
5.3.2	High-tech imports less re-imports, % total trade	11.6	25	
5.3.3	Comm., computer & info. services imp., % total trade	1.8	24	
5.3.4	FDI net inflows, % GDP	0.2	127	○
6	**Knowledge & technology outputs**	**41.1**	**23**	
6.1	Knowledge creation	33.9	29	
6.1.1	Domestic resident patent app./bn PPP$ GDP	5.8	15	
6.1.2	PCT resident patent app./bn PPP$ GDP	3.2	15	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.1	56	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	25.7	32	
6.1.5	Citable documents H index	742.0	4	●
6.2	Knowledge impact	44.4	39	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.2	95	○
6.2.2	New businesses/th pop. 15–64	2.9	38	
6.2.3	Computer software spending, % GDP	0.6	14	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	11.7	35	
6.2.5	High- & medium-high-tech manufactures, %	43.1	16	
6.3	Knowledge diffusion	44.9	25	
6.3.1	Royalty & license fees receipts, % total trade	1.4	12	●
6.3.2	High-tech exports less re-exports, % total trade	14.3	12	●
6.3.3	Comm., computer & info. services exp., % total trade	1.9	44	
6.3.4	FDI net outflows, % GDP	0.0	109	○
7	**Creative outputs**	**50.8**	**19**	
7.1	Intangible assets	59.8	14	●
7.1.1	Domestic res trademark app./bn PPP$ GDP	121.0	7	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.5	21	
7.1.3	ICTs & business model creation†	65.5	30	
7.1.4	ICTs & organizational model creation†	58.5	46	
7.2	Creative goods & services	34.6	28	
7.2.1	Cultural & creative services exports, % total trade	1.1	12	
7.2.2	National feature films/mn pop. 15–69	6.1	32	
7.2.3	Global ent. & media output/th pop. 15–69	47.2	14	
7.2.4	Printing & publishing output manufactures, %	1.3	56	○
7.2.5	Creative goods exports, % total trade	1.7	27	
7.3	Online creativity	49.0	23	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	46.8	19	
7.3.2	Country-code TLDs/th pop. 15–69	27.0	29	
7.3.3	Wikipedia edits/pop. 15–69	4814.5	27	
7.3.4	Video uploads on YouTube/pop. 15–69	86.5	21	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Gambia

Key indicators

Population (millions)	1.9
GDP (US$ billions)	0.8
GDP per capita, PPP$	2,081.5
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**27.5**	**112**	
Innovation Output Sub-Index		24.0	94	
Innovation Input Sub-Index		31.0	121	
Innovation Efficiency Ratio		0.8	39	●
Global Innovation Index 2014 (out of 143)		29.0	104	
1	**Institutions**	**47.2**	**114**	
1.1	Political environment	42.5	89	
1.1.1	Political stability*	63.0	70	●
1.1.2	Government effectiveness*	22.0	115	
1.2	Regulatory environment	49.7	114	
1.2.1	Regulatory quality*	38.0	101	
1.2.2	Rule of law*	32.0	97	
1.2.3	Cost of redundancy dismissal, salary weeks	26.0	112	
1.3	Business environment	49.4	134	○
1.3.1	Ease of starting a business*	68.4	126	
1.3.2	Ease of resolving insolvency*	41.5	95	
1.3.3	Ease of paying taxes*	38.4	136	○
2	**Human capital & research**	**11.1**	**138**	○
2.1	Education	21.2	133	○
2.1.1	Expenditure on education, % GDP	4.1	84	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	13.1	90	
2.1.3	School life expectancy, years◴	8.8	123	○
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	n/a	n/a	
2.2.1	Tertiary enrolment, % gross	n/a	n/a	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	1.1	114	
2.3.1	Researchers, FTE/mn pop.◴	33.8	100	○
2.3.2	Gross expenditure on R&D, % GDP◴	0.1	101	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**23.4**	**122**	
3.1	Information & communication technologies (ICTs)	20.3	122	
3.1.1	ICT access*	33.9	109	
3.1.2	ICT use*	5.1	122	
3.1.3	Government's online service*	20.5	120	
3.1.4	E-participation*	21.6	119	
3.2	General infrastructure	20.6	116	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	4.5	127	○
3.2.3	Gross capital formation, % GDP	21.4	72	●
3.3	Ecological sustainability	29.3	97	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	29.3	129	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	n/a	n/a	
4	**Market sophistication**	**36.0**	**126**	
4.1	Credit	8.8	133	○
4.1.1	Ease of getting credit*	20.0	128	
4.1.2	Domestic credit to private sector, % GDP	15.4	128	
4.1.3	Microfinance gross loans, % GDP◴	0.2	52	●
4.2	Investment	39.2	52	
4.2.1	Ease of protecting investors*	39.2	129	○
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	60.1	128	
4.3.1	Applied tariff rate, weighted mean, %	12.5	130	○
4.3.2	Intensity of local competition†	64.2	84	
5	**Business sophistication**	**37.4**	**53**	
5.1	Knowledge workers	29.3	94	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	25.6	74	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	34.3	62	
5.2.1	University/industry research collaboration†	38.9	84	
5.2.2	State of cluster development†	46.1	70	●
5.2.3	GERD financed by abroad, %◴	15.9	28	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	48.5	17	●
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	2.7	127	○
5.3.3	Comm., computer & info. services imp., % total trade◴	3.2	3	●
5.3.4	FDI net inflows, % GDP	2.8	68	●
6	**Knowledge & technology outputs**	**29.3**	**51**	
6.1	Knowledge creation	24.7	39	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.0	28	●
6.1.4	Scientific & technical articles/bn PPP$ GDP	39.6	16	●
6.1.5	Citable documents H index	85.0	84	
6.2	Knowledge impact	13.1	125	
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.0	115	
6.2.5	High- & medium-high-tech manufactures, %◴	16.8	61	
6.3	Knowledge diffusion	50.0	15	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.0	122	○
6.3.3	Comm., computer & info. services exp., % total trade◴	6.0	1	●
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**18.6**	**122**	
7.1	Intangible assets	36.9	109	
7.1.1	Domestic res trademark app./bn PPP$ GDP	18.4	85	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	52.7	79	
7.1.4	ICTs & organizational model creation†	49.0	80	
7.2	Creative goods & services	0.3	137	○
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	0.1	98	○
7.2.5	Creative goods exports, % total trade	0.0	116	
7.3	Online creativity	0.4	121	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.1	131	○
7.3.2	Country-code TLDs/th pop. 15–69	0.6	99	
7.3.3	Wikipedia edits/pop. 15–69	49.7	121	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Georgia

Key indicators

Population (millions)	4.3
GDP (US$ billions)	16.5
GDP per capita, PPP$	6,569.9
Income group	Lower-middle income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**33.8**	**73**	
Innovation Output Sub-Index		25.8	86	
Innovation Input Sub-Index		41.8	67	
Innovation Efficiency Ratio		0.6	107	
Global Innovation Index 2014 (out of 143)		34.5	74	
1	**Institutions**	**68.2**	**51**	
1.1	Political environment	54.2	60	
1.1.1	Political stability*	52.7	94	
1.1.2	Government effectiveness*	55.8	44	
1.2	Regulatory environment	78.0	34	
1.2.1	Regulatory quality*	67.4	40	
1.2.2	Rule of law*	47.0	62	
1.2.3	Cost of redundancy dismissal, salary weeks	8.6	20	●
1.3	Business environment	72.3	57	
1.3.1	Ease of starting a business*	97.7	5	●
1.3.2	Ease of resolving insolvency*	36.5	108	
1.3.3	Ease of paying taxes*	82.8	33	
2	**Human capital & research**	**23.6**	**91**	
2.1	Education	38.4	89	
2.1.1	Expenditure on education, % GDP	2.0	125	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	15.5	83	
2.1.3	School life expectancy, years	13.8	62	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	7.6	1	●
2.2	Tertiary education	30.5	74	
2.2.1	Tertiary enrolment, % gross	33.1	73	
2.2.2	Graduates in science & engineering, %	20.7	51	
2.2.3	Tertiary inbound mobility, %	3.0	52	
2.3	Research & development (R&D)	2.0	102	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP◴	0.2	94	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**36.6**	**79**	
3.1	Information & communication technologies (ICTs)	51.1	55	
3.1.1	ICT access*	59.9	66	
3.1.2	ICT use*	25.8	81	
3.1.3	Government's online service*	59.8	49	
3.1.4	E-participation*	58.8	49	
3.2	General infrastructure	26.5	90	
3.2.1	Electricity output, kWh/cap	2159.2	75	
3.2.2	Logistics performance*	17.7	107	○
3.2.3	Gross capital formation, % GDP	25.9	40	
3.3	Ecological sustainability	32.1	90	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.2	61	
3.3.2	Environmental performance*	47.2	90	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	110	
4	**Market sophistication**	**52.8**	**42**	
4.1	Credit	52.8	20	●
4.1.1	Ease of getting credit*	85.0	7	●
4.1.2	Domestic credit to private sector, % GDP	39.8	84	
4.1.3	Microfinance gross loans, % GDP	5.2	7	●
4.2	Investment	26.4	111	
4.2.1	Ease of protecting investors*	60.8	41	
4.2.2	Market capitalization, % GDP	6.0	98	○
4.2.3	Total value of stocks traded, % GDP	0.0	105	○
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	37	
4.3	Trade & competition	79.3	56	
4.3.1	Applied tariff rate, weighted mean, %	0.7	3	●
4.3.2	Intensity of local competition†	60.7	101	
5	**Business sophistication**	**28.0**	**105**	
5.1	Knowledge workers	27.1	100	
5.1.1	Knowledge-intensive employment, %◴	22.2	66	
5.1.2	Firms offering formal training, % firms	10.5	106	○
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	14.5	40	
5.2	Innovation linkages	31.7	67	
5.2.1	University/industry research collaboration†	27.3	124	○
5.2.2	State of cluster development†	37.1	109	○
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	19	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.1	46	
5.3	Knowledge absorption	25.2	113	
5.3.1	Royalty & license fees payments, % total trade	0.2	94	
5.3.2	High-tech imports less re-imports, % total trade	6.0	82	
5.3.3	Comm., computer & info. services imp., % total trade	0.5	96	
5.3.4	FDI net inflows, % GDP	6.3	25	●
6	**Knowledge & technology outputs**	**26.6**	**67**	
6.1	Knowledge creation	20.2	49	
6.1.1	Domestic resident patent app./bn PPP$ GDP	3.5	27	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	87	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.9	16	
6.1.4	Scientific & technical articles/bn PPP$ GDP	16.3	47	
6.1.5	Citable documents H index	90.0	80	
6.2	Knowledge impact	39.6	58	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.8	33	
6.2.2	New businesses/th pop. 15–64	4.9	22	●
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.0	82	
6.2.5	High- & medium-high-tech manufactures, %	12.9	71	
6.3	Knowledge diffusion	20.1	112	
6.3.1	Royalty & license fees receipts, % total trade	0.0	75	
6.3.2	High-tech exports less re-exports, % total trade	0.3	90	
6.3.3	Comm., computer & info. services exp., % total trade	0.7	87	
6.3.4	FDI net outflows, % GDP	0.7	57	
7	**Creative outputs**	**25.0**	**99**	
7.1	Intangible assets	36.2	110	
7.1.1	Domestic res trademark app./bn PPP$ GDP	51.3	48	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.6	39	
7.1.3	ICTs & business model creation†	48.9	98	
7.1.4	ICTs & organizational model creation†	43.1	104	
7.2	Creative goods & services	22.1	60	
7.2.1	Cultural & creative services exports, % total trade	0.1	58	
7.2.2	National feature films/mn pop. 15–69	2.9	52	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	3.5	8	●
7.2.5	Creative goods exports, % total trade	0.0	108	○
7.3	Online creativity	5.4	91	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.8	93	
7.3.2	Country-code TLDs/th pop. 15–69	2.8	66	
7.3.3	Wikipedia edits/pop. 15–69	1586.9	62	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Germany

Key indicators

Population (millions)	82.7
GDP (US$ billions)	3,859.5
GDP per capita, PPP$	41,248.1
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**57.1**	**12**	
Innovation Output Sub-Index		53.1	8	
Innovation Input Sub-Index		61.0	18	
Innovation Efficiency Ratio		0.9	13	
Global Innovation Index 2014 (out of 143)		56.0	13	
1	**Institutions**	**83.2**	**20**	
1.1	Political environment	84.8	18	
1.1.1	Political stability*	87.1	24	
1.1.2	Government effectiveness*	82.4	16	
1.2	Regulatory environment	81.5	26	
1.2.1	Regulatory quality*	89.1	15	
1.2.2	Rule of law*	90.6	16	
1.2.3	Cost of redundancy dismissal, salary weeks	21.6	98	○
1.3	Business environment	83.4	19	
1.3.1	Ease of starting a business*	81.4	93	○
1.3.2	Ease of resolving insolvency*	91.8	3	●
1.3.3	Ease of paying taxes*	77.0	56	
2	**Human capital & research**	**56.6**	**10**	
2.1	Education	53.5	37	
2.1.1	Expenditure on education, % GDP	5.0	58	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	24.1	43	
2.1.3	School life expectancy, years	16.5	15	
2.1.4	PISA scales in reading, maths, & science	515.1	13	
2.1.5	Pupil-teacher ratio, secondary	12.7	44	
2.2	Tertiary education	48.2	22	
2.2.1	Tertiary enrolment, % gross	61.7	37	
2.2.2	Graduates in science & engineering, %	27.2	15	
2.2.3	Tertiary inbound mobility, %	7.0	25	
2.3	Research & development (R&D)	68.0	9	
2.3.1	Researchers, FTE/mn pop.	4362.6	14	
2.3.2	Gross expenditure on R&D, % GDP	3.0	8	
2.3.3	QS university ranking, average score top 3*	80.2	9	
3	**Infrastructure**	**56.7**	**18**	
3.1	Information & communication technologies (ICTs)	72.9	22	
3.1.1	ICT access*	91.9	5	●
3.1.2	ICT use*	62.1	24	
3.1.3	Government's online service*	66.9	34	
3.1.4	E-participation*	70.6	24	
3.2	General infrastructure	45.3	28	
3.2.1	Electricity output, kWh/cap	7660.9	24	
3.2.2	Logistics performance*	100.0	1	●
3.2.3	Gross capital formation, % GDP	17.7	112	○
3.3	Ecological sustainability	52.1	23	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.2	36	
3.3.2	Environmental performance*	80.5	6	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.2	44	
4	**Market sophistication**	**59.2**	**22**	
4.1	Credit	49.9	23	
4.1.1	Ease of getting credit*	70.0	22	
4.1.2	Domestic credit to private sector, % GDP	93.1	33	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	38.5	59	
4.2.1	Ease of protecting investors*	59.2	49	
4.2.2	Market capitalization, % GDP	42.1	48	
4.2.3	Total value of stocks traded, % GDP	34.7	24	
4.2.4	Venture capital deals/tr PPP$ GDP	0.2	16	
4.3	Trade & competition	89.2	7	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	81.8	10	
5	**Business sophistication**	**49.2**	**20**	
5.1	Knowledge workers	59.4	24	
5.1.1	Knowledge-intensive employment, %	42.9	18	
5.1.2	Firms offering formal training, % firms◴	35.4	51	
5.1.3	GERD performed by business, % of GDP	2.0	7	
5.1.4	GERD financed by business, %◴	66.1	4	●
5.1.5	Females employed w/advanced degrees, % total	13.9	43	○
5.2	Innovation linkages	46.0	22	
5.2.1	University/industry research collaboration†	72.3	10	
5.2.2	State of cluster development†	74.9	2	●
5.2.3	GERD financed by abroad, %◴	4.3	69	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	49	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	2.4	7	
5.3	Knowledge absorption	42.2	33	
5.3.1	Royalty & license fees payments, % total trade	0.8	37	
5.3.2	High-tech imports less re-imports, % total trade	9.6	39	
5.3.3	Comm., computer & info. services imp., % total trade	2.0	17	
5.3.4	FDI net inflows, % GDP	0.9	115	○
6	**Knowledge & technology outputs**	**53.4**	**10**	
6.1	Knowledge creation	64.7	5	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	13.1	1	●
6.1.2	PCT resident patent app./bn PPP$ GDP	4.8	11	
6.1.3	Domestic res utility model app./bn PPP$ GDP	3.2	9	
6.1.4	Scientific & technical articles/bn PPP$ GDP	26.0	31	
6.1.5	Citable documents H index	815.0	3	●
6.2	Knowledge impact	46.6	31	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.3	91	○
6.2.2	New businesses/th pop. 15–64	1.3	59	○
6.2.3	Computer software spending, % GDP	0.6	18	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	15.6	23	
6.2.5	High- & medium-high-tech manufactures, %	55.5	5	●
6.3	Knowledge diffusion	49.0	20	
6.3.1	Royalty & license fees receipts, % total trade	1.1	15	
6.3.2	High-tech exports less re-exports, % total trade	12.0	17	
6.3.3	Comm., computer & info. services exp., % total trade	2.2	35	
6.3.4	FDI net outflows, % GDP	2.2	32	
7	**Creative outputs**	**52.8**	**14**	
7.1	Intangible assets	55.2	29	
7.1.1	Domestic res trademark app./bn PPP$ GDP	66.3	30	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.7	16	
7.1.3	ICTs & business model creation†	69.3	19	
7.1.4	ICTs & organizational model creation†	66.6	21	
7.2	Creative goods & services	28.1	43	
7.2.1	Cultural & creative services exports, % total trade	0.4	39	
7.2.2	National feature films/mn pop. 15–69	3.8	45	
7.2.3	Global ent. & media output/th pop. 15–69	50.1	11	
7.2.4	Printing & publishing output manufactures, %	1.2	61	○
7.2.5	Creative goods exports, % total trade	1.8	25	
7.3	Online creativity	72.8	7	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	63.7	14	
7.3.2	Country-code TLDs/th pop. 15–69	100.0	1	●
7.3.3	Wikipedia edits/pop. 15–69	5952.1	19	
7.3.4	Video uploads on YouTube/pop. 15–69	83.6	27	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Ghana

Key indicators

Population (millions)	26.4
GDP (US$ billions)	38.6
GDP per capita, PPP$	3,589.7
Income group	Lower-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**28.0**	**108**	
Innovation Output Sub-Index		22.9	102	
Innovation Input Sub-Index		33.2	116	
Innovation Efficiency Ratio		0.7	79	
Global Innovation Index 2014 (out of 143)		30.3	96	
1	**Institutions**	**48.3**	**109**	
1.1	Political environment	51.9	63	
1.1.1	Political stability*	64.7	64	
1.1.2	Government effectiveness*	39.1	76	
1.2	Regulatory environment	33.7	135	○
1.2.1	Regulatory quality*	49.9	67	
1.2.2	Rule of law*	50.5	57	●
1.2.3	Cost of redundancy dismissal, salary weeks	49.8	135	○
1.3	Business environment	59.2	108	
1.3.1	Ease of starting a business*	83.7	78	
1.3.2	Ease of resolving insolvency*	22.5	135	○
1.3.3	Ease of paying taxes*	71.5	79	
2	**Human capital & research**	**23.2**	**94**	
2.1	Education	47.0	59	●
2.1.1	Expenditure on education, % GDP	8.1	6	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	25.7	36	●
2.1.3	School life expectancy, years	11.5	98	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	17.5	76	
2.2	Tertiary education	18.7	105	
2.2.1	Tertiary enrolment, % gross	12.2	105	
2.2.2	Graduates in science & engineering, %	14.2	86	
2.2.3	Tertiary inbound mobility, %	3.1	51	
2.3	Research & development (R&D)	3.8	86	
2.3.1	Researchers, FTE/mn pop.◴	38.8	94	
2.3.2	Gross expenditure on R&D, % GDP◴	0.4	71	
2.3.3	QS university ranking, average score top 3*	2.3	72	
3	**Infrastructure**	**28.4**	**107**	
3.1	Information & communication technologies (ICTs)	33.3	97	
3.1.1	ICT access*	44.7	92	
3.1.2	ICT use*	17.6	94	
3.1.3	Government's online service*	31.5	98	
3.1.4	E-participation*	39.2	82	
3.2	General infrastructure	24.3	103	
3.2.1	Electricity output, kWh/cap	473.9	107	
3.2.2	Logistics performance*	23.8	95	
3.2.3	Gross capital formation, % GDP	24.6	48	●
3.3	Ecological sustainability	27.6	108	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	8.1	51	●
3.3.2	Environmental performance*	32.1	124	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	117	
4	**Market sophistication**	**37.5**	**123**	
4.1	Credit	23.9	93	
4.1.1	Ease of getting credit*	65.0	34	●
4.1.2	Domestic credit to private sector, % GDP	17.0	122	
4.1.3	Microfinance gross loans, % GDP	0.2	55	
4.2	Investment	25.0	125	
4.2.1	Ease of protecting investors*	58.3	54	●
4.2.2	Market capitalization, % GDP	8.3	93	
4.2.3	Total value of stocks traded, % GDP	0.1	97	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	47	
4.3	Trade & competition	63.7	120	
4.3.1	Applied tariff rate, weighted mean, %◴	8.6	112	
4.3.2	Intensity of local competition†	57.4	113	
5	**Business sophistication**	**28.7**	**100**	
5.1	Knowledge workers	20.6	121	
5.1.1	Knowledge-intensive employment, %◴	8.6	103	
5.1.2	Firms offering formal training, % firms	40.1	46	
5.1.3	GERD performed by business, % of GDP◴	0.0	87	○
5.1.4	GERD financed by business, %◴	0.1	90	○
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	30.8	73	
5.2.1	University/industry research collaboration†	41.0	74	
5.2.2	State of cluster development†	45.5	74	
5.2.3	GERD financed by abroad, %◴	31.2	14	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	77	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	108	○
5.3	Knowledge absorption	34.8	62	
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	5.1	99	
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	6.7	21	●
6	**Knowledge & technology outputs**	**25.0**	**76**	
6.1	Knowledge creation	5.7	98	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP◴	0.0	91	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	6.5	88	
6.1.5	Citable documents H index	82.0	86	
6.2	Knowledge impact	45.5	37	●
6.2.1	Growth rate of PPP$ GDP/worker, %	5.3	5	●
6.2.2	New businesses/th pop. 15–64	0.9	72	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.5	127	○
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	23.7	95	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.3	87	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	0.0	104	
7	**Creative outputs**	**20.8**	**119**	
7.1	Intangible assets	37.0	107	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.0	66	○
7.1.3	ICTs & business model creation†	50.1	93	
7.1.4	ICTs & organizational model creation†	42.2	109	
7.2	Creative goods & services	2.4	124	○
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.1	96	
7.3	Online creativity	6.7	86	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.8	108	
7.3.2	Country-code TLDs/th pop. 15–69	0.0	139	○
7.3.3	Wikipedia edits/pop. 15–69	101.7	114	
7.3.4	Video uploads on YouTube/pop. 15–69	25.3	72	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Greece

Key indicators

Population (millions)	11.1
GDP (US$ billions)	238.0
GDP per capita, PPP$	24,574.1
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**40.3**	**45**	
Innovation Output Sub-Index		31.8	57	
Innovation Input Sub-Index		48.8	38	
Innovation Efficiency Ratio		0.7	98	
Global Innovation Index 2014 (out of 143)		38.9	50	
1	**Institutions**	**68.2**	**52**	
1.1	Political environment	56.4	55	
1.1.1	Political stability*	59.3	79	
1.1.2	Government effectiveness*	53.5	47	
1.2	Regulatory environment	73.1	45	
1.2.1	Regulatory quality*	64.2	42	
1.2.2	Rule of law*	59.3	47	
1.2.3	Cost of redundancy dismissal, salary weeks	15.9	71	
1.3	Business environment	75.0	47	
1.3.1	Ease of starting a business*	90.7	43	
1.3.2	Ease of resolving insolvency*	56.0	50	
1.3.3	Ease of paying taxes*	78.3	49	
2	**Human capital & research**	**45.9**	**28**	
2.1	Education	52.3	41	
2.1.1	Expenditure on education, % GDP◴	4.1	83	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	21.5	51	
2.1.3	School life expectancy, years	17.6	8	●
2.1.4	PISA scales in reading, maths, & science	465.6	39	
2.1.5	Pupil-teacher ratio, secondary◴	7.9	5	●
2.2	Tertiary education	58.8	6	●
2.2.1	Tertiary enrolment, % gross	116.6	1	●
2.2.2	Graduates in science & engineering, %	28.7	12	●
2.2.3	Tertiary inbound mobility, %	4.4	40	
2.3	Research & development (R&D)	26.5	36	
2.3.1	Researchers, FTE/mn pop.	2486.3	33	
2.3.2	Gross expenditure on R&D, % GDP	0.8	43	
2.3.3	QS university ranking, average score top 3*	31.4	44	
3	**Infrastructure**	**47.9**	**42**	
3.1	Information & communication technologies (ICTs)	65.7	34	
3.1.1	ICT access*	75.3	34	
3.1.2	ICT use*	46.5	44	
3.1.3	Government's online service*	60.6	47	
3.1.4	E-participation*	80.4	17	●
3.2	General infrastructure	26.1	94	
3.2.1	Electricity output, kWh/cap	5194.2	41	
3.2.2	Logistics performance*	53.1	42	
3.2.3	Gross capital formation, % GDP	13.8	133	○
3.3	Ecological sustainability	52.0	24	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.4	33	
3.3.2	Environmental performance*	73.3	23	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	3.7	26	
4	**Market sophistication**	**51.2**	**49**	
4.1	Credit	44.9	33	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	122.6	23	●
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	26.7	110	
4.2.1	Ease of protecting investors*	57.5	60	
4.2.2	Market capitalization, % GDP	17.9	75	
4.2.3	Total value of stocks traded, % GDP	5.9	46	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	49	
4.3	Trade & competition	82.1	41	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	67.6	68	
5	**Business sophistication**	**30.8**	**90**	
5.1	Knowledge workers	35.5	78	
5.1.1	Knowledge-intensive employment, %	32.3	42	
5.1.2	Firms offering formal training, % firms◴	20.0	91	○
5.1.3	GERD performed by business, % of GDP	0.3	44	
5.1.4	GERD financed by business, %	32.1	45	
5.1.5	Females employed w/advanced degrees, % total	15.8	34	
5.2	Innovation linkages	27.6	90	
5.2.1	University/industry research collaboration†	34.4	108	○
5.2.2	State of cluster development†	33.4	119	○
5.2.3	GERD financed by abroad, %	13.3	33	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	17	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	67	
5.3	Knowledge absorption	29.3	95	
5.3.1	Royalty & license fees payments, % total trade	0.5	55	
5.3.2	High-tech imports less re-imports, % total trade	5.8	86	
5.3.3	Comm., computer & info. services imp., % total trade	1.2	52	
5.3.4	FDI net inflows, % GDP	1.1	111	○
6	**Knowledge & technology outputs**	**26.0**	**71**	
6.1	Knowledge creation	18.2	51	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.5	40	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.5	39	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.1	55	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	34.0	22	●
6.1.5	Citable documents H index	295.0	29	
6.2	Knowledge impact	37.7	66	
6.2.1	Growth rate of PPP$ GDP/worker, %	-0.7	108	○
6.2.2	New businesses/th pop. 15–64◴	0.8	79	
6.2.3	Computer software spending, % GDP	0.6	16	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	26.2	14	●
6.2.5	High- & medium-high-tech manufactures, %◴	14.1	68	
6.3	Knowledge diffusion	22.1	103	
6.3.1	Royalty & license fees receipts, % total trade	0.1	60	
6.3.2	High-tech exports less re-exports, % total trade	1.4	56	
6.3.3	Comm., computer & info. services exp., % total trade	1.6	57	
6.3.4	FDI net outflows, % GDP	-0.3	115	○
7	**Creative outputs**	**37.5**	**49**	
7.1	Intangible assets	35.4	114	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.4	45	
7.1.3	ICTs & business model creation†	43.5	117	○
7.1.4	ICTs & organizational model creation†	40.4	116	○
7.2	Creative goods & services	40.6	15	●
7.2.1	Cultural & creative services exports, % total trade	0.1	63	
7.2.2	National feature films/mn pop. 15–69	8.8	20	
7.2.3	Global ent. & media output/th pop. 15–69	15.7	28	
7.2.4	Printing & publishing output manufactures, %◴	7.1	1	●
7.2.5	Creative goods exports, % total trade	0.6	56	
7.3	Online creativity	38.6	35	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	13.8	38	
7.3.2	Country-code TLDs/th pop. 15–69	22.4	31	
7.3.3	Wikipedia edits/pop. 15–69	4568.8	31	
7.3.4	Video uploads on YouTube/pop. 15–69	84.7	26	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Guatemala

Key indicators

Population (millions)	15.9
GDP (US$ billions)	60.4
GDP per capita, PPP$	5,415.4
Income group	Lower-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**28.8**	**101**	
Innovation Output Sub-Index		23.1	101	
Innovation Input Sub-Index		34.6	107	
Innovation Efficiency Ratio		0.7	89	
Global Innovation Index 2014 (out of 143)		30.8	93	
1	**Institutions**	**48.2**	**110**	
1.1	Political environment	34.6	113	
1.1.1	Political stability*	47.0	105	
1.1.2	Government effectiveness*	22.1	114	
1.2	Regulatory environment	46.2	120	
1.2.1	Regulatory quality*	42.2	87	
1.2.2	Rule of law*	18.1	129	
1.2.3	Cost of redundancy dismissal, salary weeks	27.0	115	
1.3	Business environment	63.7	88	
1.3.1	Ease of starting a business*	83.7	79	
1.3.2	Ease of resolving insolvency*	27.4	130	○
1.3.3	Ease of paying taxes*	80.0	46	●
2	**Human capital & research**	**18.2**	**110**	
2.1	Education	27.9	123	
2.1.1	Expenditure on education, % GDP	2.8	112	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	5.1	111	○
2.1.3	School life expectancy, years◴	10.6	110	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	13.7	49	
2.2	Tertiary education	26.3	84	
2.2.1	Tertiary enrolment, % gross	18.7	93	
2.2.2	Graduates in science & engineering, %◴	16.8	69	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	0.3	122	
2.3.1	Researchers, FTE/mn pop.◴	27.2	102	○
2.3.2	Gross expenditure on R&D, % GDP◴	0.0	114	○
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**24.0**	**117**	
3.1	Information & communication technologies (ICTs)	21.9	120	
3.1.1	ICT access*	43.5	94	
3.1.2	ICT use*	9.6	112	
3.1.3	Government's online service*	15.0	128	
3.1.4	E-participation*	19.6	121	
3.2	General infrastructure	15.5	130	○
3.2.1	Electricity output, kWh/cap	624.1	103	
3.2.2	Logistics performance*	32.5	74	
3.2.3	Gross capital formation, % GDP	14.3	129	
3.3	Ecological sustainability	34.6	83	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	8.5	47	
3.3.2	Environmental performance*	48.1	87	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	122	
4	**Market sophistication**	**48.3**	**62**	
4.1	Credit	31.2	66	
4.1.1	Ease of getting credit*	80.0	11	●
4.1.2	Domestic credit to private sector, % GDP	32.6	92	
4.1.3	Microfinance gross loans, % GDP	0.4	49	
4.2	Investment	31.7	88	
4.2.1	Ease of protecting investors*	31.7	135	○
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	82.0	43	●
4.3.1	Applied tariff rate, weighted mean, %	2.7	55	
4.3.2	Intensity of local competition†	73.4	40	●
5	**Business sophistication**	**34.5**	**68**	
5.1	Knowledge workers	28.8	96	
5.1.1	Knowledge-intensive employment, %	10.8	100	
5.1.2	Firms offering formal training, % firms◴	51.9	22	●
5.1.3	GERD performed by business, % of GDP◴	0.0	89	○
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	3.5	80	
5.2	Innovation linkages	44.9	25	●
5.2.1	University/industry research collaboration†	43.6	66	
5.2.2	State of cluster development†	49.1	54	
5.2.3	GERD financed by abroad, %◴	49.0	5	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	87	
5.3	Knowledge absorption	29.7	93	
5.3.1	Royalty & license fees payments, % total trade	0.7	47	●
5.3.2	High-tech imports less re-imports, % total trade	9.3	44	●
5.3.3	Comm., computer & info. services imp., % total trade	0.5	93	
5.3.4	FDI net inflows, % GDP	2.5	71	
6	**Knowledge & technology outputs**	**18.9**	**109**	
6.1	Knowledge creation	1.9	136	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.0	108	○
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	97	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.2	46	
6.1.4	Scientific & technical articles/bn PPP$ GDP	1.0	134	○
6.1.5	Citable documents H index	58.0	109	
6.2	Knowledge impact	28.7	109	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.4	88	
6.2.2	New businesses/th pop. 15–64	0.5	87	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.8	94	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	26.1	79	
6.3.1	Royalty & license fees receipts, % total trade	0.1	54	
6.3.2	High-tech exports less re-exports, % total trade	1.4	58	
6.3.3	Comm., computer & info. services exp., % total trade	2.3	33	●
6.3.4	FDI net outflows, % GDP	0.1	87	
7	**Creative outputs**	**27.2**	**89**	
7.1	Intangible assets	48.9	53	
7.1.1	Domestic res trademark app./bn PPP$ GDP◴	39.3	64	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	63.4	38	●
7.1.4	ICTs & organizational model creation†	62.2	28	●
7.2	Creative goods & services	7.3	108	
7.2.1	Cultural & creative services exports, % total trade	0.0	76	
7.2.2	National feature films/mn pop. 15–69◴	1.3	69	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.4	63	
7.3	Online creativity	3.9	96	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	5.4	57	
7.3.2	Country-code TLDs/th pop. 15–69	0.7	94	
7.3.3	Wikipedia edits/pop. 15–69	774.9	87	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Guinea

Key indicators

Population (millions)	12.0
GDP (US$ billions)	6.5
GDP per capita, PPP$	1,164.3
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**18.5**	**139**	○
Innovation Output Sub-Index		14.1	134	
Innovation Input Sub-Index		22.9	140	○
Innovation Efficiency Ratio		0.6	109	●
Global Innovation Index 2014 (out of 143)		20.2	139	
1	**Institutions**	**39.3**	**132**	
1.1	Political environment	19.8	136	
1.1.1	Political stability*	33.8	126	
1.1.2	Government effectiveness*	5.7	138	
1.2	Regulatory environment	57.7	95	●
1.2.1	Regulatory quality*	21.0	129	
1.2.2	Rule of law*	9.8	139	○
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	40.4	137	
1.3.1	Ease of starting a business*	55.4	136	
1.3.2	Ease of resolving insolvency*	37.6	106	●
1.3.3	Ease of paying taxes*	28.3	139	○
2	**Human capital & research**	**7.6**	**140**	○
2.1	Education	16.9	138	
2.1.1	Expenditure on education, % GDP	2.5	119	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	9.9	101	
2.1.3	School life expectancy, years	8.7	124	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	33.1	113	
2.2	Tertiary education	5.9	132	
2.2.1	Tertiary enrolment, % gross	9.9	112	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	0.9	83	●
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**12.5**	**141**	○
3.1	Information & communication technologies (ICTs)	6.3	140	○
3.1.1	ICT access*	22.8	130	
3.1.2	ICT use*	0.5	137	○
3.1.3	Government's online service*	0.0	140	○
3.1.4	E-participation*	2.0	140	○
3.2	General infrastructure	12.0	137	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	15.5	112	
3.2.3	Gross capital formation, % GDP	12.9	135	
3.3	Ecological sustainability	19.2	135	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	28.0	131	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	114	
4	**Market sophistication**	**35.4**	**130**	
4.1	Credit	11.5	130	
4.1.1	Ease of getting credit*	30.0	113	
4.1.2	Domestic credit to private sector, % GDP◴	9.1	137	○
4.1.3	Microfinance gross loans, % GDP◴	0.2	51	●
4.2	Investment	39.2	52	
4.2.1	Ease of protecting investors*	39.2	129	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	55.7	134	
4.3.1	Applied tariff rate, weighted mean, %	11.9	129	
4.3.2	Intensity of local competition†	53.3	123	
5	**Business sophistication**	**19.7**	**139**	○
5.1	Knowledge workers	11.7	134	
5.1.1	Knowledge-intensive employment, %◴	0.7	116	○
5.1.2	Firms offering formal training, % firms◴	21.1	89	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	25.3	98	●
5.2.1	University/industry research collaboration†	19.7	131	○
5.2.2	State of cluster development†	33.7	118	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.1	42	●
5.3	Knowledge absorption	22.2	131	
5.3.1	Royalty & license fees payments, % total trade◴	0.0	115	
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.5	95	●
5.3.4	FDI net inflows, % GDP	0.4	124	
6	**Knowledge & technology outputs**	**10.2**	**135**	
6.1	Knowledge creation	3.7	118	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	3.5	112	●
6.1.5	Citable documents H index	37.0	129	
6.2	Knowledge impact	1.2	141	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	0.2	96	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.4	128	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	25.8	81	●
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	94	
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade◴	2.0	42	●
6.3.4	FDI net outflows, % GDP	0.0	107	
7	**Creative outputs**	**17.9**	**125**	
7.1	Intangible assets	32.2	125	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	35.9	129	
7.1.4	ICTs & organizational model creation†	28.6	131	○
7.2	Creative goods & services	7.1	110	
7.2.1	Cultural & creative services exports, % total trade	0.2	53	●
7.2.2	National feature films/mn pop. 15–69◴	0.8	82	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	0.0	141	○
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.1	134	
7.3.2	Country-code TLDs/th pop. 15–69	0.1	122	
7.3.3	Wikipedia edits/pop. 15–69	5.6	140	○
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Guyana

Key indicators

Population (millions)	0.8
GDP (US$ billions)	3.0
GDP per capita, PPP$	8,735.1
Income group	Lower-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**30.7**	**86**	
Innovation Output Sub-Index		24.3	93	
Innovation Input Sub-Index		37.2	90	
Innovation Efficiency Ratio		0.7	95	
Global Innovation Index 2014 (out of 143)		32.5	80	
1	**Institutions**	**54.4**	**87**	
1.1	Political environment	45.1	82	
1.1.1	Political stability*	53.2	93	
1.1.2	Government effectiveness*	37.0	81	
1.2	Regulatory environment	57.7	94	
1.2.1	Regulatory quality*	31.4	111	
1.2.2	Rule of law*	33.7	91	
1.2.3	Cost of redundancy dismissal, salary weeks	16.6	74	
1.3	Business environment	60.3	101	
1.3.1	Ease of starting a business*	83.6	80	
1.3.2	Ease of resolving insolvency*	28.5	127	○
1.3.3	Ease of paying taxes*	68.7	90	
2	**Human capital & research**	**14.0**	**129**	○
2.1	Education	27.0	125	
2.1.1	Expenditure on education, % GDP	3.2	106	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	9.8	102	○
2.1.3	School life expectancy, years	10.3	113	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	20.3	86	
2.2	Tertiary education	15.1	112	
2.2.1	Tertiary enrolment, % gross	12.9	104	
2.2.2	Graduates in science & engineering, %	13.4	90	○
2.2.3	Tertiary inbound mobility, %	0.4	98	
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**25.0**	**115**	
3.1	Information & communication technologies (ICTs)	27.9	106	
3.1.1	ICT access*	40.4	101	
3.1.2	ICT use*	13.6	105	
3.1.3	Government's online service*	24.4	113	
3.1.4	E-participation*	33.3	92	
3.2	General infrastructure	21.7	114	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	15.2	114	
3.2.3	Gross capital formation, % GDP	19.7	90	
3.3	Ecological sustainability	25.4	119	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	38.1	114	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.0	138	○
4	**Market sophistication**	**35.1**	**134**	○
4.1	Credit	10.9	131	○
4.1.1	Ease of getting credit*	15.0	129	○
4.1.2	Domestic credit to private sector, % GDP	43.3	78	
4.1.3	Microfinance gross loans, % GDP◴	0.4	46	
4.2	Investment	25.4	121	
4.2.1	Ease of protecting investors*	44.2	117	
4.2.2	Market capitalization, % GDP	21.4	67	
4.2.3	Total value of stocks traded, % GDP◴	0.0	104	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	69.2	98	
4.3.1	Applied tariff rate, weighted mean, %	6.5	97	
4.3.2	Intensity of local competition†	61.1	98	
5	**Business sophistication**	**57.5**	**6**	
5.1	Knowledge workers	78.6	1	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	63.0	8	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	47.5	18	
5.2.1	University/industry research collaboration†	45.9	56	●
5.2.2	State of cluster development†	48.3	59	●
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	46.4	22	●
5.3.1	Royalty & license fees payments, % total trade	3.4	1	●
5.3.2	High-tech imports less re-imports, % total trade	3.6	117	○
5.3.3	Comm., computer & info. services imp., % total trade	1.7	27	●
5.3.4	FDI net inflows, % GDP	6.5	22	●
6	**Knowledge & technology outputs**	**9.7**	**137**	○
6.1	Knowledge creation	4.2	111	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	4.7	100	
6.1.5	Citable documents H index	28.0	134	○
6.2	Knowledge impact	10.9	126	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	5.3	60	●
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	13.9	130	○
6.3.1	Royalty & license fees receipts, % total trade	0.3	28	●
6.3.2	High-tech exports less re-exports, % total trade	0.0	127	○
6.3.3	Comm., computer & info. services exp., % total trade	0.7	89	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**38.9**	**44**	
7.1	Intangible assets	50.2	47	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	49.8	94	
7.1.4	ICTs & organizational model creation†	50.7	75	
7.2	Creative goods & services	53.0	2	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69◴	22.9	7	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	1.7	26	●
7.3	Online creativity	2.2	107	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.5	97	
7.3.2	Country-code TLDs/th pop. 15–69	2.4	69	
7.3.3	Wikipedia edits/pop. 15–69	373.4	97	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Honduras

Key indicators

Population (millions)	8.3
GDP (US$ billions)	19.5
GDP per capita, PPP$	4,959.2
Income group	Lower-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**27.5**	**113**	
Innovation Output Sub-Index		20.0	116	
Innovation Input Sub-Index		34.9	105	
Innovation Efficiency Ratio		0.6	117	
Global Innovation Index 2014 (out of 143)		26.7	118	
1	**Institutions**	**44.7**	**123**	○
1.1	Political environment	37.0	108	
1.1.1	Political stability*	52.6	95	
1.1.2	Government effectiveness*	21.3	116	
1.2	Regulatory environment	42.2	126	○
1.2.1	Regulatory quality*	42.5	86	
1.2.2	Rule of law*	14.9	135	○
1.2.3	Cost of redundancy dismissal, salary weeks	30.3	127	○
1.3	Business environment	54.9	117	
1.3.1	Ease of starting a business*	74.8	111	
1.3.2	Ease of resolving insolvency*	31.8	120	○
1.3.3	Ease of paying taxes*	57.9	118	
2	**Human capital & research**	**19.0**	**106**	
2.1	Education	38.4	90	
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	11.1	105	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	18.2	106	
2.2.1	Tertiary enrolment, % gross	21.1	89	
2.2.2	Graduates in science & engineering, %	14.1	87	○
2.2.3	Tertiary inbound mobility, %	0.9	84	
2.3	Research & development (R&D)	0.3	121	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP◴	0.0	116	○
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**28.9**	**102**	
3.1	Information & communication technologies (ICTs)	30.8	103	
3.1.1	ICT access*	39.4	103	
3.1.2	ICT use*	10.3	110	
3.1.3	Government's online service*	40.2	80	
3.1.4	E-participation*	33.3	92	
3.2	General infrastructure	24.9	99	
3.2.1	Electricity output, kWh/cap	956.3	92	
3.2.2	Logistics performance*	22.8	97	
3.2.3	Gross capital formation, % GDP	24.8	46	●
3.3	Ecological sustainability	30.9	93	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.2	87	
3.3.2	Environmental performance*	48.9	86	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	93	
4	**Market sophistication**	**48.1**	**64**	
4.1	Credit	42.4	39	●
4.1.1	Ease of getting credit*	85.0	7	●
4.1.2	Domestic credit to private sector, % GDP	55.2	60	
4.1.3	Microfinance gross loans, % GDP	2.1	26	●
4.2	Investment	31.7	88	
4.2.1	Ease of protecting investors*	31.7	135	○
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	70.4	93	
4.3.1	Applied tariff rate, weighted mean, %◴	6.5	96	
4.3.2	Intensity of local competition†	63.4	85	
5	**Business sophistication**	**34.0**	**72**	
5.1	Knowledge workers	31.7	88	
5.1.1	Knowledge-intensive employment, %◴	12.8	98	
5.1.2	Firms offering formal training, % firms◴	35.8	49	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	42.5	31	●
5.2.1	University/industry research collaboration†	49.0	46	●
5.2.2	State of cluster development†	50.9	45	●
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	39	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	27.8	104	
5.3.1	Royalty & license fees payments, % total trade	0.4	67	
5.3.2	High-tech imports less re-imports, % total trade	6.2	78	
5.3.3	Comm., computer & info. services imp., % total trade	0.7	80	
5.3.4	FDI net inflows, % GDP	5.8	26	●
6	**Knowledge & technology outputs**	**14.7**	**123**	○
6.1	Knowledge creation	2.2	135	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.2	92	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.2	45	
6.1.4	Scientific & technical articles/bn PPP$ GDP	0.9	135	○
6.1.5	Citable documents H index	45.0	120	○
6.2	Knowledge impact	13.8	124	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.3	52	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.9	71	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	28.0	66	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.4	84	
6.3.3	Comm., computer & info. services exp., % total trade	2.3	30	●
6.3.4	FDI net outflows, % GDP	0.2	83	
7	**Creative outputs**	**25.4**	**97**	
7.1	Intangible assets	48.2	57	●
7.1.1	Domestic res trademark app./bn PPP$ GDP	55.5	39	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	56.7	67	
7.1.4	ICTs & organizational model creation†	57.7	51	●
7.2	Creative goods & services	2.6	123	○
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69◴	0.4	96	○
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade◴	0.1	91	
7.3	Online creativity	2.3	106	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.7	110	
7.3.2	Country-code TLDs/th pop. 15–69	0.6	100	
7.3.3	Wikipedia edits/pop. 15–69	777.8	86	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Hong Kong (China)

Key indicators

Population (millions)	7.3
GDP (US$ billions)	289.6
GDP per capita, PPP$	55,026.0
Income group	High income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**57.2**	**11**	
Innovation Output Sub-Index		46.9	19	
Innovation Input Sub-Index		67.6	4	
Innovation Efficiency Ratio		0.7	76	
Global Innovation Index 2014 (out of 143)		56.8	10	
1	**Institutions**	**91.4**	**8**	
1.1	Political environment	87.1	14	
1.1.1	Political stability*	86.0	28	
1.1.2	Government effectiveness*	88.3	10	
1.2	Regulatory environment	96.9	6	
1.2.1	Regulatory quality*	99.1	2	●
1.2.2	Rule of law*	88.7	17	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	90.0	6	
1.3.1	Ease of starting a business*	96.4	8	
1.3.2	Ease of resolving insolvency*	75.1	23	
1.3.3	Ease of paying taxes*	98.5	4	
2	**Human capital & research**	**50.2**	**19**	
2.1	Education	45.1	68	
2.1.1	Expenditure on education, % GDP	3.8	93	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	19.0	63	
2.1.3	School life expectancy, years	15.6	30	
2.1.4	PISA scales in reading, maths, & science	553.6	3	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	59.6	5	
2.2.1	Tertiary enrolment, % gross	66.8	29	
2.2.2	Graduates in science & engineering, %◴	34.7	6	
2.2.3	Tertiary inbound mobility, %	8.9	20	
2.3	Research & development (R&D)	45.8	22	
2.3.1	Researchers, FTE/mn pop.◴	2970.7	28	
2.3.2	Gross expenditure on R&D, % GDP◴	0.7	48	
2.3.3	QS university ranking, average score top 3*	84.7	6	
3	**Infrastructure**	**66.5**	**2**	●
3.1	Information & communication technologies (ICTs)	83.0	9	
3.1.1	ICT access*	92.4	4	
3.1.2	ICT use*	73.6	13	
3.1.3	Government's online service*	n/a	n/a	
3.1.4	E-participation*	n/a	n/a	
3.2	General infrastructure	45.1	29	
3.2.1	Electricity output, kWh/cap	5423.9	39	
3.2.2	Logistics performance*	84.9	15	
3.2.3	Gross capital formation, % GDP	23.7	52	
3.3	Ecological sustainability	71.3	1	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	21.7	1	●
3.3.2	Environmental performance*	n/a	n/a	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.8	51	
4	**Market sophistication**	**79.0**	**2**	●
4.1	Credit	71.3	4	
4.1.1	Ease of getting credit*	70.0	22	
4.1.2	Domestic credit to private sector, % GDP	219.5	2	●
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	81.5	1	●
4.2.1	Ease of protecting investors*	80.8	2	●
4.2.2	Market capitalization, % GDP	421.9	1	●
4.2.3	Total value of stocks traded, % GDP	468.1	1	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.4	10	
4.3	Trade & competition	84.3	32	
4.3.1	Applied tariff rate, weighted mean, %	n/a	n/a	
4.3.2	Intensity of local competition†	84.3	3	●
5	**Business sophistication**	**51.0**	**15**	
5.1	Knowledge workers	47.3	40	
5.1.1	Knowledge-intensive employment, %	37.3	28	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	0.3	42	
5.1.4	GERD financed by business, %◴	49.7	20	
5.1.5	Females employed w/advanced degrees, % total	12.2	54	○
5.2	Innovation linkages	42.9	28	
5.2.1	University/industry research collaboration†	59.8	27	
5.2.2	State of cluster development†	66.7	14	
5.2.3	GERD financed by abroad, %◴	4.7	65	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	9	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.3	30	
5.3	Knowledge absorption	62.7	3	●
5.3.1	Royalty & license fees payments, % total trade◴	0.4	66	
5.3.2	High-tech imports less re-imports, % total trade	41.5	1	●
5.3.3	Comm., computer & info. services imp., % total trade◴	0.5	90	○
5.3.4	FDI net inflows, % GDP	28.0	1	●
6	**Knowledge & technology outputs**	**37.9**	**31**	
6.1	Knowledge creation	16.0	55	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.6	72	○
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.8	31	
6.1.4	Scientific & technical articles/bn PPP$ GDP	n/a	n/a	
6.1.5	Citable documents H index	325.0	25	
6.2	Knowledge impact	53.2	15	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.3	26	
6.2.2	New businesses/th pop. 15–64	28.1	1	●
6.2.3	Computer software spending, % GDP	0.4	24	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	6.4	54	
6.2.5	High- & medium-high-tech manufactures, %	19.4	59	○
6.3	Knowledge diffusion	44.6	26	
6.3.1	Royalty & license fees receipts, % total trade◴	0.1	56	
6.3.2	High-tech exports less re-exports, % total trade	0.1	106	○
6.3.3	Comm., computer & info. services exp., % total trade◴	0.5	93	○
6.3.4	FDI net outflows, % GDP	33.4	1	●
7	**Creative outputs**	**55.8**	**8**	
7.1	Intangible assets	57.3	18	
7.1.1	Domestic res trademark app./bn PPP$ GDP	67.1	28	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	67.3	24	
7.1.4	ICTs & organizational model creation†	67.6	20	
7.2	Creative goods & services	42.1	10	
7.2.1	Cultural & creative services exports, % total trade	0.2	54	○
7.2.2	National feature films/mn pop. 15–69	7.4	26	
7.2.3	Global ent. & media output/th pop. 15–69	41.6	18	
7.2.4	Printing & publishing output manufactures, %◴	18.3	1	●
7.2.5	Creative goods exports, % total trade	0.2	74	○
7.3	Online creativity	66.5	12	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	79.1	9	
7.3.2	Country-code TLDs/th pop. 15–69	10.9	42	
7.3.3	Wikipedia edits/pop. 15–69	11073.5	2	●
7.3.4	Video uploads on YouTube/pop. 15–69	94.1	5	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Hungary

Key indicators

Population (millions)	9.9
GDP (US$ billions)	137.1
GDP per capita, PPP$	20,817.4
Income group	Upper-middle income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**43.0**	**35**	
Innovation Output Sub-Index		37.7	37	
Innovation Input Sub-Index		48.2	42	
Innovation Efficiency Ratio		0.8	35	
Global Innovation Index 2014 (out of 143)		44.6	35	
1	**Institutions**	**73.4**	**40**	
1.1	Political environment	71.1	37	
1.1.1	Political stability*	83.4	35	
1.1.2	Government effectiveness*	58.8	42	
1.2	Regulatory environment	78.1	33	
1.2.1	Regulatory quality*	71.4	35	
1.2.2	Rule of law*	62.6	40	
1.2.3	Cost of redundancy dismissal, salary weeks	13.4	56	
1.3	Business environment	71.0	60	
1.3.1	Ease of starting a business*	90.0	48	
1.3.2	Ease of resolving insolvency*	49.8	61	
1.3.3	Ease of paying taxes*	73.3	70	
2	**Human capital & research**	**37.7**	**43**	
2.1	Education	49.8	53	
2.1.1	Expenditure on education, % GDP	4.7	68	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	20.9	54	
2.1.3	School life expectancy, years	15.4	35	
2.1.4	PISA scales in reading, maths, & science	486.6	30	
2.1.5	Pupil-teacher ratio, secondary	10.0	29	
2.2	Tertiary education	33.5	63	
2.2.1	Tertiary enrolment, % gross	59.6	41	
2.2.2	Graduates in science & engineering, %	16.8	67	
2.2.3	Tertiary inbound mobility, %	4.6	37	
2.3	Research & development (R&D)	29.9	34	
2.3.1	Researchers, FTE/mn pop.	2515.1	32	
2.3.2	Gross expenditure on R&D, % GDP	1.4	25	
2.3.3	QS university ranking, average score top 3*	25.3	49	
3	**Infrastructure**	**47.2**	**43**	
3.1	Information & communication technologies (ICTs)	55.2	47	
3.1.1	ICT access*	73.2	36	
3.1.2	ICT use*	46.7	43	
3.1.3	Government's online service*	55.9	53	
3.1.4	E-participation*	45.1	74	
3.2	General infrastructure	32.1	64	
3.2.1	Electricity output, kWh/cap	3065.2	61	
3.2.2	Logistics performance*	66.5	32	
3.2.3	Gross capital formation, % GDP	18.8	103	○
3.3	Ecological sustainability	54.4	18	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.5	57	
3.3.2	Environmental performance*	70.3	28	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	8.3	11	●
4	**Market sophistication**	**46.0**	**77**	
4.1	Credit	30.2	73	
4.1.1	Ease of getting credit*	75.0	16	●
4.1.2	Domestic credit to private sector, % GDP	50.8	65	
4.1.3	Microfinance gross loans, % GDP◴	0.0	89	○
4.2	Investment	23.3	132	○
4.2.1	Ease of protecting investors*	47.5	97	○
4.2.2	Market capitalization, % GDP	16.6	77	○
4.2.3	Total value of stocks traded, % GDP	8.6	42	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	42	
4.3	Trade & competition	84.6	31	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	72.5	45	
5	**Business sophistication**	**36.8**	**57**	
5.1	Knowledge workers	40.9	60	
5.1.1	Knowledge-intensive employment, %	35.6	34	
5.1.2	Firms offering formal training, % firms	15.7	99	○
5.1.3	GERD performed by business, % of GDP	1.0	22	
5.1.4	GERD financed by business, %	46.8	23	
5.1.5	Females employed w/advanced degrees, % total	14.8	38	
5.2	Innovation linkages	29.3	83	
5.2.1	University/industry research collaboration†	54.6	34	
5.2.2	State of cluster development†	41.5	88	
5.2.3	GERD financed by abroad, %	16.6	26	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	69	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.1	38	
5.3	Knowledge absorption	40.3	40	
5.3.1	Royalty & license fees payments, % total trade	1.1	24	
5.3.2	High-tech imports less re-imports, % total trade	13.8	18	●
5.3.3	Comm., computer & info. services imp., % total trade	1.0	59	
5.3.4	FDI net inflows, % GDP	-0.6	132	○
6	**Knowledge & technology outputs**	**34.7**	**40**	
6.1	Knowledge creation	21.4	45	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.7	35	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.6	32	
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.0	27	
6.1.4	Scientific & technical articles/bn PPP$ GDP	26.4	29	
6.1.5	Citable documents H index	277.0	30	
6.2	Knowledge impact	48.4	24	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.2	94	○
6.2.2	New businesses/th pop. 15–64	4.8	23	
6.2.3	Computer software spending, % GDP	0.3	41	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	30.7	8	●
6.2.5	High- & medium-high-tech manufactures, %	48.7	8	●
6.3	Knowledge diffusion	34.4	41	
6.3.1	Royalty & license fees receipts, % total trade	1.0	16	●
6.3.2	High-tech exports less re-exports, % total trade	14.3	11	●
6.3.3	Comm., computer & info. services exp., % total trade	1.4	64	
6.3.4	FDI net outflows, % GDP	-2.6	122	○
7	**Creative outputs**	**40.7**	**36**	
7.1	Intangible assets	41.3	90	
7.1.1	Domestic res trademark app./bn PPP$ GDP	39.7	63	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.2	25	
7.1.3	ICTs & business model creation†	58.4	60	
7.1.4	ICTs & organizational model creation†	51.0	73	
7.2	Creative goods & services	40.7	14	●
7.2.1	Cultural & creative services exports, % total trade	1.5	4	●
7.2.2	National feature films/mn pop. 15–69	4.4	40	
7.2.3	Global ent. & media output/th pop. 15–69	12.0	31	
7.2.4	Printing & publishing output manufactures, %	0.8	79	○
7.2.5	Creative goods exports, % total trade	6.2	7	●
7.3	Online creativity	39.6	32	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	11.8	41	
7.3.2	Country-code TLDs/th pop. 15–69	38.2	19	●
7.3.3	Wikipedia edits/pop. 15–69	2890.9	45	
7.3.4	Video uploads on YouTube/pop. 15–69	87.1	20	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Iceland

Key indicators

Population (millions)	0.3
GDP (US$ billions)	16.7
GDP per capita, PPP$	42,585.0
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**57.0**	**13**	
Innovation Output Sub-Index		56.6	6	●
Innovation Input Sub-Index		57.5	23	
Innovation Efficiency Ratio		1.0	4	●
Global Innovation Index 2014 (out of 143)		54.1	19	
1	**Institutions**	**87.8**	**13**	
1.1	Political environment	88.4	12	
1.1.1	Political stability*	95.3	9	
1.1.2	Government effectiveness*	81.5	18	
1.2	Regulatory environment	90.0	17	
1.2.1	Regulatory quality*	76.9	26	
1.2.2	Rule of law*	91.4	15	
1.2.3	Cost of redundancy dismissal, salary weeks	10.1	35	
1.3	Business environment	84.9	16	
1.3.1	Ease of starting a business*	92.4	27	
1.3.2	Ease of resolving insolvency*	81.5	14	
1.3.3	Ease of paying taxes*	80.9	41	
2	**Human capital & research**	**48.7**	**23**	
2.1	Education	56.4	21	
2.1.1	Expenditure on education, % GDP	7.4	10	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	21.2	53	
2.1.3	School life expectancy, years	19.0	3	●
2.1.4	PISA scales in reading, maths, & science	484.5	31	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	41.2	41	
2.2.1	Tertiary enrolment, % gross	81.4	9	
2.2.2	Graduates in science & engineering, %	18.0	63	○
2.2.3	Tertiary inbound mobility, %	6.2	28	
2.3	Research & development (R&D)	48.7	19	
2.3.1	Researchers, FTE/mn pop.◴	7012.2	4	●
2.3.2	Gross expenditure on R&D, % GDP◴	2.6	12	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**51.8**	**29**	
3.1	Information & communication technologies (ICTs)	69.9	27	
3.1.1	ICT access*	92.8	3	●
3.1.2	ICT use*	76.5	9	
3.1.3	Government's online service*	61.4	43	
3.1.4	E-participation*	49.0	64	
3.2	General infrastructure	47.4	22	
3.2.1	Electricity output, kWh/cap	56612.5	1	●
3.2.2	Logistics performance*	62.8	36	
3.2.3	Gross capital formation, % GDP	14.4	128	○
3.3	Ecological sustainability	38.0	69	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	2.1	121	○
3.3.2	Environmental performance*	76.5	14	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.8	37	
4	**Market sophistication**	**52.7**	**43**	
4.1	Credit	44.7	35	
4.1.1	Ease of getting credit*	60.0	48	
4.1.2	Domestic credit to private sector, % GDP	91.5	34	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	32.6	80	
4.2.1	Ease of protecting investors*	65.0	28	
4.2.2	Market capitalization, % GDP	19.9	69	○
4.2.3	Total value of stocks traded, % GDP	4.8	50	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	20	
4.3	Trade & competition	80.8	49	
4.3.1	Applied tariff rate, weighted mean, %	1.0	8	
4.3.2	Intensity of local competition†	64.9	77	
5	**Business sophistication**	**46.4**	**25**	
5.1	Knowledge workers	67.0	9	
5.1.1	Knowledge-intensive employment, %	49.3	5	●
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	1.4	15	
5.1.4	GERD financed by business, %◴	49.8	19	
5.1.5	Females employed w/advanced degrees, % total	21.3	19	
5.2	Innovation linkages	35.3	60	
5.2.1	University/industry research collaboration†	60.3	24	
5.2.2	State of cluster development†	48.7	57	
5.2.3	GERD financed by abroad, %◴	8.2	48	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.3	27	
5.3	Knowledge absorption	36.9	54	
5.3.1	Royalty & license fees payments, % total trade◴	1.4	18	
5.3.2	High-tech imports less re-imports, % total trade	4.9	100	○
5.3.3	Comm., computer & info. services imp., % total trade◴	1.7	32	
5.3.4	FDI net inflows, % GDP	2.4	73	
6	**Knowledge & technology outputs**	**40.7**	**24**	
6.1	Knowledge creation	43.3	19	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.4	42	
6.1.2	PCT resident patent app./bn PPP$ GDP	3.0	16	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	65.9	1	●
6.1.5	Citable documents H index	181.0	39	
6.2	Knowledge impact	34.7	85	
6.2.1	Growth rate of PPP$ GDP/worker, %	-0.2	103	○
6.2.2	New businesses/th pop. 15–64	8.2	13	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	4.6	67	
6.2.5	High- & medium-high-tech manufactures, %◴	7.1	85	○
6.3	Knowledge diffusion	44.2	27	
6.3.1	Royalty & license fees receipts, % total trade◴	1.7	10	
6.3.2	High-tech exports less re-exports, % total trade	1.2	59	
6.3.3	Comm., computer & info. services exp., % total trade◴	1.2	72	○
6.3.4	FDI net outflows, % GDP	4.1	14	
7	**Creative outputs**	**72.4**	**1**	●
7.1	Intangible assets	69.4	2	●
7.1.1	Domestic res trademark app./bn PPP$ GDP	98.5	13	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	8.6	1	●
7.1.3	ICTs & business model creation†	68.1	22	
7.1.4	ICTs & organizational model creation†	69.6	14	
7.2	Creative goods & services	53.5	1	●
7.2.1	Cultural & creative services exports, % total trade	0.3	46	
7.2.2	National feature films/mn pop. 15–69	30.1	1	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	6.4	1	●
7.2.5	Creative goods exports, % total trade	0.1	92	○
7.3	Online creativity	97.4	1	●
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	100.0	1	●
7.3.2	Country-code TLDs/th pop. 15–69	92.2	7	●
7.3.3	Wikipedia edits/pop. 15–69	13529.2	1	●
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Key indicators

Population (millions)	1,267.4
GDP (US$ billions)	2,049.5
GDP per capita, PPP$	4,306.9
Income group	Lower-middle income
Region	Central and Southern Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**31.7**	**81**	
Innovation Output Sub-Index		28.0	69	
Innovation Input Sub-Index		35.5	100	
Innovation Efficiency Ratio		0.8	31	●
Global Innovation Index 2014 (out of 143)		33.7	76	
1	**Institutions**	**50.0**	**104**	
1.1	Political environment	35.5	109	
1.1.1	Political stability*	34.8	124	○
1.1.2	Government effectiveness*	36.3	82	
1.2	Regulatory environment	62.4	81	
1.2.1	Regulatory quality*	35.2	107	
1.2.2	Rule of law*	45.0	63	
1.2.3	Cost of redundancy dismissal, salary weeks	15.7	70	
1.3	Business environment	52.2	130	○
1.3.1	Ease of starting a business*	68.4	125	○
1.3.2	Ease of resolving insolvency*	32.6	118	
1.3.3	Ease of paying taxes*	55.5	120	
2	**Human capital & research**	**20.0**	**103**	
2.1	Education	26.8	126	○
2.1.1	Expenditure on education, % GDP	3.8	90	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	15.5	82	
2.1.3	School life expectancy, years◴	11.7	95	
2.1.4	PISA scales in reading, maths, & science◴	336.0	62	○
2.1.5	Pupil-teacher ratio, secondary◴	25.9	97	
2.2	Tertiary education	10.5	123	○
2.2.1	Tertiary enrolment, % gross	24.8	85	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	0.1	112	○
2.3	Research & development (R&D)	22.6	44	
2.3.1	Researchers, FTE/mn pop.◴	159.9	75	
2.3.2	Gross expenditure on R&D, % GDP◴	0.8	42	
2.3.3	QS university ranking, average score top 3*	47.0	28	●
3	**Infrastructure**	**34.6**	**87**	
3.1	Information & communication technologies (ICTs)	38.6	86	
3.1.1	ICT access*	30.5	115	
3.1.2	ICT use*	6.8	117	
3.1.3	Government's online service*	54.3	57	
3.1.4	E-participation*	62.7	40	
3.2	General infrastructure	38.9	43	
3.2.1	Electricity output, kWh/cap	911.8	94	
3.2.2	Logistics performance*	46.9	52	
3.2.3	Gross capital formation, % GDP	32.2	14	●
3.3	Ecological sustainability	26.3	117	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.0	65	
3.3.2	Environmental performance*	31.2	126	○
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.9	70	
4	**Market sophistication**	**46.5**	**72**	
4.1	Credit	28.1	80	
4.1.1	Ease of getting credit*	65.0	34	
4.1.2	Domestic credit to private sector, % GDP	51.8	64	
4.1.3	Microfinance gross loans, % GDP	0.3	50	
4.2	Investment	44.3	42	●
4.2.1	Ease of protecting investors*	72.5	7	●
4.2.2	Market capitalization, % GDP	68.0	24	●
4.2.3	Total value of stocks traded, % GDP	33.5	25	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	35	
4.3	Trade & competition	67.2	104	
4.3.1	Applied tariff rate, weighted mean, %◴	8.2	109	
4.3.2	Intensity of local competition†	63.1	88	
5	**Business sophistication**	**26.4**	**116**	
5.1	Knowledge workers	13.7	132	○
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	15.9	98	○
5.1.3	GERD performed by business, % of GDP◴	0.3	43	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	37.3	52	
5.2.1	University/industry research collaboration†	47.8	48	
5.2.2	State of cluster development†	58.4	25	●
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	51	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.1	52	
5.3	Knowledge absorption	28.1	99	
5.3.1	Royalty & license fees payments, % total trade	0.8	42	
5.3.2	High-tech imports less re-imports, % total trade	6.7	70	
5.3.3	Comm., computer & info. services imp., % total trade	0.7	74	
5.3.4	FDI net inflows, % GDP	1.5	98	
6	**Knowledge & technology outputs**	**30.1**	**49**	
6.1	Knowledge creation	15.2	59	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.6	53	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.2	49	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	7.5	77	
6.1.5	Citable documents H index	341.0	23	●
6.2	Knowledge impact	35.0	84	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.4	38	
6.2.2	New businesses/th pop. 15–64	0.1	99	○
6.2.3	Computer software spending, % GDP	0.2	68	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	6.0	57	
6.2.5	High- & medium-high-tech manufactures, %◴	32.5	32	
6.3	Knowledge diffusion	40.1	34	●
6.3.1	Royalty & license fees receipts, % total trade	0.1	57	
6.3.2	High-tech exports less re-exports, % total trade	3.5	39	●
6.3.3	Comm., computer & info. services exp., % total trade	10.1	1	●
6.3.4	FDI net outflows, % GDP	0.1	92	
7	**Creative outputs**	**25.9**	**95**	
7.1	Intangible assets	37.9	101	
7.1.1	Domestic res trademark app./bn PPP$ GDP	27.0	75	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	51.7	84	
7.1.4	ICTs & organizational model creation†	48.1	86	
7.2	Creative goods & services	17.3	77	
7.2.1	Cultural & creative services exports, % total trade	0.1	59	
7.2.2	National feature films/mn pop. 15–69◴	1.5	65	
7.2.3	Global ent. & media output/th pop. 15–69	0.2	58	○
7.2.4	Printing & publishing output manufactures, %◴	0.7	84	
7.2.5	Creative goods exports, % total trade	2.5	18	●
7.3	Online creativity	10.3	78	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.2	104	
7.3.2	Country-code TLDs/th pop. 15–69	0.7	92	
7.3.3	Wikipedia edits/pop. 15–69	264.6	102	
7.3.4	Video uploads on YouTube/pop. 15–69	37.3	68	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Indonesia

Key indicators

Population (millions)	252.8
GDP (US$ billions)	888.6
GDP per capita, PPP$	5,499.0
Income group	Lower-middle income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**29.8**	**97**	
Innovation Output Sub-Index		25.8	85	
Innovation Input Sub-Index		33.7	114	
Innovation Efficiency Ratio		0.8	42	●
Global Innovation Index 2014 (out of 143)		31.8	87	
1	**Institutions**	**39.8**	**130**	○
1.1	Political environment	43.4	86	
1.1.1	Political stability*	51.8	97	
1.1.2	Government effectiveness*	35.0	84	
1.2	Regulatory environment	19.6	138	○
1.2.1	Regulatory quality*	42.6	85	
1.2.2	Rule of law*	32.9	94	
1.2.3	Cost of redundancy dismissal, salary weeks	57.8	137	○
1.3	Business environment	56.4	114	
1.3.1	Ease of starting a business*	68.8	122	
1.3.2	Ease of resolving insolvency*	46.8	70	
1.3.3	Ease of paying taxes*	53.7	122	
2	**Human capital & research**	**24.3**	**87**	
2.1	Education	32.9	106	
2.1.1	Expenditure on education, % GDP	3.6	98	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	10.7	95	
2.1.3	School life expectancy, years	13.0	81	
2.1.4	PISA scales in reading, maths, & science	384.4	59	○
2.1.5	Pupil-teacher ratio, secondary	16.6	73	
2.2	Tertiary education	28.1	79	
2.2.1	Tertiary enrolment, % gross	31.5	74	
2.2.2	Graduates in science & engineering, %◴	21.7	40	
2.2.3	Tertiary inbound mobility, %	0.1	108	○
2.3	Research & development (R&D)	11.9	64	
2.3.1	Researchers, FTE/mn pop.◴	89.9	84	
2.3.2	Gross expenditure on R&D, % GDP◴	0.1	109	○
2.3.3	QS university ranking, average score top 3*	32.9	41	●
3	**Infrastructure**	**35.6**	**85**	
3.1	Information & communication technologies (ICTs)	31.7	100	
3.1.1	ICT access*	43.2	95	
3.1.2	ICT use*	18.0	93	
3.1.3	Government's online service*	36.2	90	
3.1.4	E-participation*	29.4	104	
3.2	General infrastructure	40.1	39	●
3.2.1	Electricity output, kWh/cap	793.5	97	
3.2.2	Logistics performance*	47.0	51	
3.2.3	Gross capital formation, % GDP	33.4	13	●
3.3	Ecological sustainability	35.0	81	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.1	38	●
3.3.2	Environmental performance*	44.4	96	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.6	75	
4	**Market sophistication**	**44.4**	**86**	
4.1	Credit	20.4	115	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	37.9	87	
4.1.3	Microfinance gross loans, % GDP	0.0	85	○
4.2	Investment	31.7	86	
4.2.1	Ease of protecting investors*	60.8	41	
4.2.2	Market capitalization, % GDP	45.3	42	
4.2.3	Total value of stocks traded, % GDP	10.5	38	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	65	
4.3	Trade & competition	81.1	48	
4.3.1	Applied tariff rate, weighted mean, %◴	2.6	52	
4.3.2	Intensity of local competition†	71.0	51	
5	**Business sophistication**	**24.6**	**124**	
5.1	Knowledge workers	7.2	138	○
5.1.1	Knowledge-intensive employment, %	8.9	102	
5.1.2	Firms offering formal training, % firms◴	4.7	108	○
5.1.3	GERD performed by business, % of GDP◴	0.0	79	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	3.9	79	
5.2	Innovation linkages	35.8	58	
5.2.1	University/industry research collaboration†	59.1	29	●
5.2.2	State of cluster development†	58.8	24	●
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	84	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	105	○
5.3	Knowledge absorption	30.9	86	
5.3.1	Royalty & license fees payments, % total trade	0.8	40	●
5.3.2	High-tech imports less re-imports, % total trade	8.4	52	
5.3.3	Comm., computer & info. services imp., % total trade	0.7	73	
5.3.4	FDI net inflows, % GDP	2.1	79	
6	**Knowledge & technology outputs**	**20.9**	**100**	
6.1	Knowledge creation	2.9	127	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.3	86	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	98	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.1	54	
6.1.4	Scientific & technical articles/bn PPP$ GDP	0.6	137	○
6.1.5	Citable documents H index	126.0	56	
6.2	Knowledge impact	37.6	67	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.6	21	●
6.2.2	New businesses/th pop. 15–64	0.3	92	
6.2.3	Computer software spending, % GDP	0.3	44	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.1	79	
6.2.5	High- & medium-high-tech manufactures, %	30.9	36	
6.3	Knowledge diffusion	22.3	102	
6.3.1	Royalty & license fees receipts, % total trade	0.0	80	
6.3.2	High-tech exports less re-exports, % total trade	3.1	43	
6.3.3	Comm., computer & info. services exp., % total trade	0.5	92	
6.3.4	FDI net outflows, % GDP	1.1	52	
7	**Creative outputs**	**30.8**	**78**	
7.1	Intangible assets	45.2	68	
7.1.1	Domestic res trademark app./bn PPP$ GDP	18.1	87	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	65.3	32	●
7.1.4	ICTs & organizational model creation†	61.3	33	●
7.2	Creative goods & services	17.8	75	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69◴	0.5	95	
7.2.3	Global ent. & media output/th pop. 15–69	1.8	50	
7.2.4	Printing & publishing output manufactures, %	0.9	75	
7.2.5	Creative goods exports, % total trade	1.9	22	●
7.3	Online creativity	14.9	73	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.9	91	
7.3.2	Country-code TLDs/th pop. 15–69	0.3	108	
7.3.3	Wikipedia edits/pop. 15–69	260.6	103	
7.3.4	Video uploads on YouTube/pop. 15–69	55.5	65	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Iran, Islamic Republic of

Key indicators

Population (millions)	78.5
GDP (US$ billions)	404.1
GDP per capita, PPP$	12,478.2
Income group	Upper-middle income
Region	Central and Southern Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**28.4**	**106**	
Innovation Output Sub-Index		22.0	105	
Innovation Input Sub-Index		34.8	106	
Innovation Efficiency Ratio		0.6	103	
Global Innovation Index 2014 (out of 143)		26.1	120	
1	**Institutions**	**44.3**	**126**	
1.1	Political environment	27.7	125	
1.1.1	Political stability*	32.8	128	
1.1.2	Government effectiveness*	22.6	112	
1.2	Regulatory environment	42.4	125	
1.2.1	Regulatory quality*	7.9	137	○
1.2.2	Rule of law*	21.5	123	
1.2.3	Cost of redundancy dismissal, salary weeks	23.1	106	
1.3	Business environment	62.8	93	
1.3.1	Ease of starting a business*	89.4	53	●
1.3.2	Ease of resolving insolvency*	32.4	119	
1.3.3	Ease of paying taxes*	66.8	98	
2	**Human capital & research**	**37.1**	**46**	●
2.1	Education	35.6	97	
2.1.1	Expenditure on education, % GDP	3.7	95	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	15.9	80	
2.1.3	School life expectancy, years	15.1	41	●
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	61.8	4	●
2.2.1	Tertiary enrolment, % gross	55.2	48	●
2.2.2	Graduates in science & engineering, %	47.2	1	●
2.2.3	Tertiary inbound mobility, %	0.1	109	○
2.3	Research & development (R&D)	14.0	59	
2.3.1	Researchers, FTE/mn pop.◴	736.1	54	
2.3.2	Gross expenditure on R&D, % GDP◴	0.7	46	
2.3.3	QS university ranking, average score top 3*	15.6	56	
3	**Infrastructure**	**39.9**	**68**	
3.1	Information & communication technologies (ICTs)	34.0	96	
3.1.1	ICT access*	55.3	71	
3.1.2	ICT use*	14.4	103	
3.1.3	Government's online service*	37.0	87	
3.1.4	E-participation*	29.4	104	
3.2	General infrastructure	56.1	10	●
3.2.1	Electricity output, kWh/cap	3327.3	55	
3.2.2	Logistics performance*	n/a	n/a	
3.2.3	Gross capital formation, % GDP	43.0	6	●
3.3	Ecological sustainability	29.5	96	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.8	101	
3.3.2	Environmental performance*	51.1	74	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.5	78	
4	**Market sophistication**	**29.9**	**139**	○
4.1	Credit	23.8	95	
4.1.1	Ease of getting credit*	45.0	80	
4.1.2	Domestic credit to private sector, % GDP	12.2	133	○
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	26.0	116	
4.2.1	Ease of protecting investors*	41.7	123	
4.2.2	Market capitalization, % GDP	28.0	60	
4.2.3	Total value of stocks traded, % GDP	4.4	52	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	39.9	140	○
4.3.1	Applied tariff rate, weighted mean, %◴	21.8	138	○
4.3.2	Intensity of local competition†	56.6	114	
5	**Business sophistication**	**22.6**	**130**	
5.1	Knowledge workers	23.8	109	
5.1.1	Knowledge-intensive employment, %◴	16.0	90	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	0.1	64	
5.1.4	GERD financed by business, %◴	30.9	48	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	23.5	107	
5.2.1	University/industry research collaboration†	36.3	99	
5.2.2	State of cluster development†	40.4	94	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	89	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	107	○
5.3	Knowledge absorption	20.3	137	○
5.3.1	Royalty & license fees payments, % total trade◴	0.2	90	
5.3.2	High-tech imports less re-imports, % total trade	4.0	111	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.6	86	
5.3.4	FDI net inflows, % GDP	0.8	116	
6	**Knowledge & technology outputs**	**22.5**	**90**	
6.1	Knowledge creation	37.7	24	
6.1.1	Domestic resident patent app./bn PPP$ GDP	8.9	8	●
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	20.0	40	●
6.1.5	Citable documents H index	158.0	44	●
6.2	Knowledge impact	27.5	114	
6.2.1	Growth rate of PPP$ GDP/worker, %	-2.8	114	○
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.3	55	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	2.0	93	
6.2.5	High- & medium-high-tech manufactures, %◴	35.5	28	●
6.3	Knowledge diffusion	2.2	135	○
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	92	
6.3.2	High-tech exports less re-exports, % total trade	0.5	75	
6.3.3	Comm., computer & info. services exp., % total trade◴	0.2	114	○
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**21.5**	**116**	
7.1	Intangible assets	35.5	113	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.0	65	○
7.1.3	ICTs & business model creation†	46.0	105	
7.1.4	ICTs & organizational model creation†	42.5	108	
7.2	Creative goods & services	7.7	106	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	1.5	67	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	0.2	97	○
7.2.5	Creative goods exports, % total trade◴	0.5	57	
7.3	Online creativity	7.3	85	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.1	86	
7.3.2	Country-code TLDs/th pop. 15–69	4.4	56	
7.3.3	Wikipedia edits/pop. 15–69	2091.4	52	●
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Ireland

Key indicators

Population (millions)	4.7
GDP (US$ billions)	246.4
GDP per capita, PPP$	40,586.5
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**59.1**	**8**	
Innovation Output Sub-Index		55.4	7	
Innovation Input Sub-Index		62.9	14	
Innovation Efficiency Ratio		0.9	12	
Global Innovation Index 2014 (out of 143)		56.7	11	
1	**Institutions**	**87.2**	**15**	
1.1	Political environment	83.4	19	
1.1.1	Political stability*	85.9	29	
1.1.2	Government effectiveness*	81.0	21	
1.2	Regulatory environment	89.5	18	
1.2.1	Regulatory quality*	89.9	14	
1.2.2	Rule of law*	93.4	13	
1.2.3	Cost of redundancy dismissal, salary weeks	14.3	60	○
1.3	Business environment	88.7	8	
1.3.1	Ease of starting a business*	94.2	18	
1.3.2	Ease of resolving insolvency*	76.9	19	
1.3.3	Ease of paying taxes*	95.1	6	●
2	**Human capital & research**	**50.1**	**20**	
2.1	Education	57.5	16	
2.1.1	Expenditure on education, % GDP	6.2	29	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	28.9	27	
2.1.3	School life expectancy, years	18.6	5	●
2.1.4	PISA scales in reading, maths, & science	515.6	12	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	45.0	30	
2.2.1	Tertiary enrolment, % gross	71.2	23	
2.2.2	Graduates in science & engineering, %	23.8	31	
2.2.3	Tertiary inbound mobility, %	5.8	31	
2.3	Research & development (R&D)	47.7	20	
2.3.1	Researchers, FTE/mn pop.◴	3438.0	24	
2.3.2	Gross expenditure on R&D, % GDP◴	1.7	23	
2.3.3	QS university ranking, average score top 3*	62.5	16	
3	**Infrastructure**	**54.9**	**24**	
3.1	Information & communication technologies (ICTs)	69.3	28	
3.1.1	ICT access*	82.4	19	
3.1.2	ICT use*	62.4	23	
3.1.3	Government's online service*	67.7	31	
3.1.4	E-participation*	64.7	33	
3.2	General infrastructure	37.9	49	
3.2.1	Electricity output, kWh/cap	5561.9	34	
3.2.2	Logistics performance*	87.0	11	
3.2.3	Gross capital formation, % GDP	16.4	118	○
3.3	Ecological sustainability	57.4	9	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	12.3	10	
3.3.2	Environmental performance*	74.7	19	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	3.3	28	
4	**Market sophistication**	**64.0**	**13**	
4.1	Credit	62.6	10	
4.1.1	Ease of getting credit*	70.0	22	
4.1.2	Domestic credit to private sector, % GDP	168.0	10	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	46.2	35	
4.2.1	Ease of protecting investors*	73.3	6	●
4.2.2	Market capitalization, % GDP	49.1	40	
4.2.3	Total value of stocks traded, % GDP	5.5	47	○
4.2.4	Venture capital deals/tr PPP$ GDP	0.4	9	
4.3	Trade & competition	83.1	37	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	69.6	58	○
5	**Business sophistication**	**58.4**	**5**	●
5.1	Knowledge workers	70.6	5	●
5.1.1	Knowledge-intensive employment, %	40.5	23	
5.1.2	Firms offering formal training, % firms◴	73.2	3	●
5.1.3	GERD performed by business, % of GDP◴	1.2	19	
5.1.4	GERD financed by business, %◴	50.3	18	
5.1.5	Females employed w/advanced degrees, % total	24.7	9	
5.2	Innovation linkages	52.7	11	
5.2.1	University/industry research collaboration†	70.7	13	
5.2.2	State of cluster development†	63.3	17	
5.2.3	GERD financed by abroad, %◴	21.4	18	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	6	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.6	22	
5.3	Knowledge absorption	51.8	11	
5.3.1	Royalty & license fees payments, % total trade	22.2	1	●
5.3.2	High-tech imports less re-imports, % total trade	5.1	95	○
5.3.3	Comm., computer & info. services imp., % total trade	1.0	61	○
5.3.4	FDI net inflows, % GDP	22.9	4	●
6	**Knowledge & technology outputs**	**55.7**	**7**	
6.1	Knowledge creation	28.5	35	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.6	54	○
6.1.2	PCT resident patent app./bn PPP$ GDP	1.9	25	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	31.4	25	
6.1.5	Citable documents H index	299.0	28	
6.2	Knowledge impact	53.9	12	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.0	72	○
6.2.2	New businesses/th pop. 15–64	4.5	25	
6.2.3	Computer software spending, % GDP	0.7	4	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	11.2	37	
6.2.5	High- & medium-high-tech manufactures, %◴	57.4	3	●
6.3	Knowledge diffusion	84.8	2	●
6.3.1	Royalty & license fees receipts, % total trade	2.5	8	
6.3.2	High-tech exports less re-exports, % total trade	11.3	20	
6.3.3	Comm., computer & info. services exp., % total trade	25.1	1	●
6.3.4	FDI net outflows, % GDP	16.2	1	●
7	**Creative outputs**	**55.0**	**12**	
7.1	Intangible assets	61.0	11	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.8	35	○
7.1.3	ICTs & business model creation†	72.4	16	
7.1.4	ICTs & organizational model creation†	70.4	13	
7.2	Creative goods & services	33.4	33	
7.2.1	Cultural & creative services exports, % total trade	0.2	51	○
7.2.2	National feature films/mn pop. 15–69	10.4	17	
7.2.3	Global ent. & media output/th pop. 15–69	43.0	17	
7.2.4	Printing & publishing output manufactures, %◴	1.6	40	
7.2.5	Creative goods exports, % total trade	2.4	19	
7.3	Online creativity	64.7	14	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	71.7	13	
7.3.2	Country-code TLDs/th pop. 15–69	25.5	30	
7.3.3	Wikipedia edits/pop. 15–69	9744.5	3	●
7.3.4	Video uploads on YouTube/pop. 15–69	89.8	14	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Key indicators

Population (millions)	7.8
GDP (US$ billions)	303.8
GDP per capita, PPP$	35,658.7
Income group	High income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**53.5**	**22**	
Innovation Output Sub-Index		48.6	16	
Innovation Input Sub-Index		58.5	22	
Innovation Efficiency Ratio		0.8	20	
Global Innovation Index 2014 (out of 143)		55.5	15	
1	**Institutions**	**67.9**	**54**	
1.1	Political environment	55.7	56	
1.1.1	Political stability*	37.1	118	○
1.1.2	Government effectiveness*	74.3	27	
1.2	Regulatory environment	68.7	59	
1.2.1	Regulatory quality*	78.6	22	
1.2.2	Rule of law*	73.0	32	
1.2.3	Cost of redundancy dismissal, salary weeks	27.4	118	○
1.3	Business environment	79.2	32	
1.3.1	Ease of starting a business*	90.5	44	
1.3.2	Ease of resolving insolvency*	75.2	22	
1.3.3	Ease of paying taxes*	71.9	76	○
2	**Human capital & research**	**55.9**	**11**	
2.1	Education	50.3	51	
2.1.1	Expenditure on education, % GDP	5.6	38	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	15.5	84	○
2.1.3	School life expectancy, years	16.0	25	
2.1.4	PISA scales in reading, maths, & science	474.1	36	○
2.1.5	Pupil-teacher ratio, secondary◴	9.8	27	
2.2	Tertiary education	31.5	72	
2.2.1	Tertiary enrolment, % gross	67.9	28	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	1.2	79	○
2.3	Research & development (R&D)	85.8	1	●
2.3.1	Researchers, FTE/mn pop.◴	8337.1	1	●
2.3.2	Gross expenditure on R&D, % GDP	4.2	1	●
2.3.3	QS university ranking, average score top 3*	57.5	22	
3	**Infrastructure**	**54.1**	**26**	
3.1	Information & communication technologies (ICTs)	78.0	13	
3.1.1	ICT access*	83.1	16	
3.1.2	ICT use*	55.3	30	
3.1.3	Government's online service*	87.4	13	
3.1.4	E-participation*	86.3	12	
3.2	General infrastructure	36.4	52	
3.2.1	Electricity output, kWh/cap	7758.1	22	
3.2.2	Logistics performance*	56.1	39	
3.2.3	Gross capital formation, % GDP	19.5	96	○
3.3	Ecological sustainability	47.9	35	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.5	29	
3.3.2	Environmental performance*	65.8	38	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.9	35	
4	**Market sophistication**	**60.5**	**21**	
4.1	Credit	46.8	29	
4.1.1	Ease of getting credit*	65.0	34	
4.1.2	Domestic credit to private sector, % GDP◴	89.5	35	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	58.9	11	
4.2.1	Ease of protecting investors*	70.8	11	
4.2.2	Market capitalization, % GDP	57.7	32	
4.2.3	Total value of stocks traded, % GDP	26.2	28	
4.2.4	Venture capital deals/tr PPP$ GDP	0.8	3	●
4.3	Trade & competition	75.9	75	
4.3.1	Applied tariff rate, weighted mean, %	0.7	4	●
4.3.2	Intensity of local competition†	54.0	120	○
5	**Business sophistication**	**54.1**	**11**	
5.1	Knowledge workers	61.1	21	
5.1.1	Knowledge-intensive employment, %	46.5	8	
5.1.2	Firms offering formal training, % firms	18.6	93	○
5.1.3	GERD performed by business, % of GDP	3.5	1	●
5.1.4	GERD financed by business, %◴	35.6	43	
5.1.5	Females employed w/advanced degrees, % total	28.4	3	●
5.2	Innovation linkages	64.9	1	●
5.2.1	University/industry research collaboration†	75.1	7	
5.2.2	State of cluster development†	58.3	26	
5.2.3	GERD financed by abroad, %◴	48.8	6	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	14	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	3.0	5	●
5.3	Knowledge absorption	36.5	56	
5.3.1	Royalty & license fees payments, % total trade◴	0.5	53	
5.3.2	High-tech imports less re-imports, % total trade	9.4	42	
5.3.3	Comm., computer & info. services imp., % total trade◴	1.2	48	
5.3.4	FDI net inflows, % GDP	4.1	37	
6	**Knowledge & technology outputs**	**53.6**	**9**	
6.1	Knowledge creation	56.5	9	
6.1.1	Domestic resident patent app./bn PPP$ GDP	4.7	22	
6.1.2	PCT resident patent app./bn PPP$ GDP	5.9	8	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	46.4	11	
6.1.5	Citable documents H index	456.0	15	
6.2	Knowledge impact	47.1	30	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.7	53	
6.2.2	New businesses/th pop. 15–64	3.0	37	
6.2.3	Computer software spending, % GDP	0.3	39	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	34.8	5	●
6.2.5	High- & medium-high-tech manufactures, %◴	30.8	37	
6.3	Knowledge diffusion	57.2	9	
6.3.1	Royalty & license fees receipts, % total trade◴	1.1	14	
6.3.2	High-tech exports less re-exports, % total trade	12.6	15	
6.3.3	Comm., computer & info. services exp., % total trade◴	4.9	6	●
6.3.4	FDI net outflows, % GDP	1.6	40	
7	**Creative outputs**	**43.6**	**29**	
7.1	Intangible assets	42.4	86	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	12.8	93	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.0	30	
7.1.3	ICTs & business model creation†	68.1	21	
7.1.4	ICTs & organizational model creation†	62.4	27	
7.2	Creative goods & services	39.1	20	
7.2.1	Cultural & creative services exports, % total trade	0.9	16	
7.2.2	National feature films/mn pop. 15–69	11.0	15	
7.2.3	Global ent. & media output/th pop. 15–69	27.8	23	
7.2.4	Printing & publishing output manufactures, %◴	2.5	18	
7.2.5	Creative goods exports, % total trade	1.7	28	
7.3	Online creativity	50.3	21	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	28.0	25	
7.3.2	Country-code TLDs/th pop. 15–69	19.1	36	
7.3.3	Wikipedia edits/pop. 15–69	7906.3	8	
7.3.4	Video uploads on YouTube/pop. 15–69	95.5	2	●

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Italy

Key indicators

Population (millions)	61.1
GDP (US$ billions)	2,148.0
GDP per capita, PPP$	30,803.0
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**46.4**	**31**	
Innovation Output Sub-Index		39.4	32	
Innovation Input Sub-Index		53.4	29	
Innovation Efficiency Ratio		0.7	57	
Global Innovation Index 2014 (out of 143)		45.7	31	
1	**Institutions**	**73.8**	**38**	
1.1	Political environment	65.2	48	
1.1.1	Political stability*	76.8	43	
1.1.2	Government effectiveness*	53.6	46	
1.2	Regulatory environment	81.4	27	
1.2.1	Regulatory quality*	68.3	38	
1.2.2	Rule of law*	57.1	50	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	74.9	49	
1.3.1	Ease of starting a business*	91.2	40	
1.3.2	Ease of resolving insolvency*	71.3	27	
1.3.3	Ease of paying taxes*	62.1	108	○
2	**Human capital & research**	**41.3**	**33**	
2.1	Education	51.0	48	
2.1.1	Expenditure on education, % GDP	4.3	78	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	23.4	46	
2.1.3	School life expectancy, years	16.0	23	
2.1.4	PISA scales in reading, maths, & science	489.5	28	
2.1.5	Pupil-teacher ratio, secondary◴	10.1	30	
2.2	Tertiary education	37.3	54	
2.2.1	Tertiary enrolment, % gross	62.5	34	
2.2.2	Graduates in science & engineering, %	20.2	56	
2.2.3	Tertiary inbound mobility, %	4.0	44	
2.3	Research & development (R&D)	35.6	29	
2.3.1	Researchers, FTE/mn pop.	1934.3	35	
2.3.2	Gross expenditure on R&D, % GDP	1.3	27	
2.3.3	QS university ranking, average score top 3*	53.2	24	
3	**Infrastructure**	**57.6**	**17**	●
3.1	Information & communication technologies (ICTs)	70.8	24	
3.1.1	ICT access*	76.2	33	
3.1.2	ICT use*	53.8	32	
3.1.3	Government's online service*	74.8	23	
3.1.4	E-participation*	78.4	19	●
3.2	General infrastructure	35.6	55	
3.2.1	Electricity output, kWh/cap	4685.4	45	
3.2.2	Logistics performance*	78.0	19	●
3.2.3	Gross capital formation, % GDP	17.4	114	○
3.3	Ecological sustainability	66.4	4	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	10.2	24	
3.3.2	Environmental performance*	74.4	22	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	11.7	4	●
4	**Market sophistication**	**53.6**	**39**	
4.1	Credit	41.5	42	
4.1.1	Ease of getting credit*	45.0	80	○
4.1.2	Domestic credit to private sector, % GDP	117.0	25	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	36.2	63	
4.2.1	Ease of protecting investors*	66.7	21	
4.2.2	Market capitalization, % GDP	23.0	64	
4.2.3	Total value of stocks traded, % GDP	36.3	22	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	43	
4.3	Trade & competition	83.2	36	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	69.8	56	
5	**Business sophistication**	**40.6**	**39**	
5.1	Knowledge workers	45.6	44	
5.1.1	Knowledge-intensive employment, %	35.1	36	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	0.7	28	
5.1.4	GERD financed by business, %◴	44.3	30	
5.1.5	Females employed w/advanced degrees, % total	10.6	58	○
5.2	Innovation linkages	38.7	47	
5.2.1	University/industry research collaboration†	45.5	57	
5.2.2	State of cluster development†	76.6	1	●
5.2.3	GERD financed by abroad, %◴	9.5	43	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	62	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.5	24	
5.3	Knowledge absorption	37.5	50	
5.3.1	Royalty & license fees payments, % total trade	1.0	32	
5.3.2	High-tech imports less re-imports, % total trade	7.2	62	
5.3.3	Comm., computer & info. services imp., % total trade	1.7	28	
5.3.4	FDI net inflows, % GDP	0.6	120	○
6	**Knowledge & technology outputs**	**41.2**	**22**	●
6.1	Knowledge creation	32.6	31	
6.1.1	Domestic resident patent app./bn PPP$ GDP	3.9	26	
6.1.2	PCT resident patent app./bn PPP$ GDP	1.4	28	
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.2	22	
6.1.4	Scientific & technical articles/bn PPP$ GDP	27.3	28	
6.1.5	Citable documents H index	654.0	7	●
6.2	Knowledge impact	54.4	10	●
6.2.1	Growth rate of PPP$ GDP/worker, %	0.0	99	○
6.2.2	New businesses/th pop. 15–64	1.9	48	
6.2.3	Computer software spending, % GDP	0.6	11	●
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	76.4	1	●
6.2.5	High- & medium-high-tech manufactures, %◴	37.6	25	
6.3	Knowledge diffusion	36.6	39	
6.3.1	Royalty & license fees receipts, % total trade	0.6	20	
6.3.2	High-tech exports less re-exports, % total trade	5.3	31	
6.3.3	Comm., computer & info. services exp., % total trade	1.5	58	
6.3.4	FDI net outflows, % GDP	1.3	47	
7	**Creative outputs**	**37.6**	**47**	
7.1	Intangible assets	37.8	102	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	50.3	49	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.3	24	
7.1.3	ICTs & business model creation†	49.2	96	○
7.1.4	ICTs & organizational model creation†	40.5	115	○
7.2	Creative goods & services	27.4	46	
7.2.1	Cultural & creative services exports, % total trade	0.3	42	
7.2.2	National feature films/mn pop. 15–69	3.9	44	
7.2.3	Global ent. & media output/th pop. 15–69	29.8	22	
7.2.4	Printing & publishing output manufactures, %◴	1.5	50	
7.2.5	Creative goods exports, % total trade	2.2	21	
7.3	Online creativity	47.4	25	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	25.8	27	
7.3.2	Country-code TLDs/th pop. 15–69	27.1	28	
7.3.3	Wikipedia edits/pop. 15–69	7569.6	13	●
7.3.4	Video uploads on YouTube/pop. 15–69	80.9	33	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Jamaica

Key indicators

Population (millions)	2.8
GDP (US$ billions)	13.8
GDP per capita, PPP$	9,255.5
Income group	Upper-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**29.9**	**96**	
Innovation Output Sub-Index		21.0	110	○
Innovation Input Sub-Index		38.9	85	
Innovation Efficiency Ratio		0.5	121	○
Global Innovation Index 2014 (out of 143)		32.4	82	
1	**Institutions**	**63.5**	**59**	
1.1	Political environment	54.7	58	
1.1.1	Political stability*	68.5	55	
1.1.2	Government effectiveness*	41.0	69	
1.2	Regulatory environment	66.8	68	
1.2.1	Regulatory quality*	53.8	63	
1.2.2	Rule of law*	37.3	83	
1.2.3	Cost of redundancy dismissal, salary weeks	14.0	58	
1.3	Business environment	68.8	69	
1.3.1	Ease of starting a business*	94.1	19	●
1.3.2	Ease of resolving insolvency*	53.3	57	
1.3.3	Ease of paying taxes*	59.0	113	○
2	**Human capital & research**	**23.5**	**92**	
2.1	Education	46.4	62	
2.1.1	Expenditure on education, % GDP	6.3	25	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	29.4	25	●
2.1.3	School life expectancy, years	12.4	86	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	16.2	71	
2.2	Tertiary education	24.1	90	
2.2.1	Tertiary enrolment, % gross	28.7	78	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**29.6**	**99**	
3.1	Information & communication technologies (ICTs)	30.8	104	
3.1.1	ICT access*	45.8	86	
3.1.2	ICT use*	26.2	79	
3.1.3	Government's online service*	31.5	98	
3.1.4	E-participation*	19.6	121	○
3.2	General infrastructure	21.9	113	○
3.2.1	Electricity output, kWh/cap	1578.2	84	
3.2.2	Logistics performance*	34.8	67	
3.2.3	Gross capital formation, % GDP	18.5	107	○
3.3	Ecological sustainability	36.0	78	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.8	73	
3.3.2	Environmental performance*	58.3	52	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.5	86	
4	**Market sophistication**	**46.3**	**74**	
4.1	Credit	30.1	74	
4.1.1	Ease of getting credit*	80.0	11	●
4.1.2	Domestic credit to private sector, % GDP	29.6	100	
4.1.3	Microfinance gross loans, % GDP	0.2	60	
4.2	Investment	35.2	67	
4.2.1	Ease of protecting investors*	56.7	67	
4.2.2	Market capitalization, % GDP	43.2	47	
4.2.3	Total value of stocks traded, % GDP	1.4	61	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	73.7	82	
4.3.1	Applied tariff rate, weighted mean, %◴	7.5	104	
4.3.2	Intensity of local competition†	73.5	37	●
5	**Business sophistication**	**31.8**	**80**	
5.1	Knowledge workers	31.4	89	
5.1.1	Knowledge-intensive employment, %◴	20.1	72	
5.1.2	Firms offering formal training, % firms◴	25.9	72	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	36.0	56	
5.2.1	University/industry research collaboration†	46.6	54	
5.2.2	State of cluster development†	44.4	79	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	57	
5.3	Knowledge absorption	28.0	101	
5.3.1	Royalty & license fees payments, % total trade	1.0	29	●
5.3.2	High-tech imports less re-imports, % total trade	3.6	115	○
5.3.3	Comm., computer & info. services imp., % total trade	0.9	62	
5.3.4	FDI net inflows, % GDP	4.0	38	●
6	**Knowledge & technology outputs**	**16.4**	**120**	○
6.1	Knowledge creation	6.9	88	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.9	66	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	5.6	93	
6.1.5	Citable documents H index	64.0	100	
6.2	Knowledge impact	24.7	120	○
6.2.1	Growth rate of PPP$ GDP/worker, %	-1.1	112	○
6.2.2	New businesses/th pop. 15–64	1.1	64	
6.2.3	Computer software spending, % GDP	0.3	28	●
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.1	112	○
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	17.5	121	○
6.3.1	Royalty & license fees receipts, % total trade	0.1	59	
6.3.2	High-tech exports less re-exports, % total trade	0.1	115	○
6.3.3	Comm., computer & info. services exp., % total trade	0.8	83	
6.3.4	FDI net outflows, % GDP	-0.6	117	○
7	**Creative outputs**	**25.6**	**96**	
7.1	Intangible assets	48.7	54	
7.1.1	Domestic res trademark app./bn PPP$ GDP	76.2	23	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	51.2	86	
7.1.4	ICTs & organizational model creation†	52.8	65	
7.2	Creative goods & services	1.6	128	○
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.0	107	○
7.3	Online creativity	3.1	102	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.3	85	
7.3.2	Country-code TLDs/th pop. 15–69	1.4	83	
7.3.3	Wikipedia edits/pop. 15–69	779.8	85	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Japan

Key indicators

Population (millions)	127.0
GDP (US$ billions)	4,616.3
GDP per capita, PPP$	38,052.7
Income group	High income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**54.0**	**19**	
Innovation Output Sub-Index		44.1	26	
Innovation Input Sub-Index		63.8	12	
Innovation Efficiency Ratio		0.7	78	
Global Innovation Index 2014 (out of 143)		52.4	21	
1	**Institutions**	**86.5**	**17**	
1.1	Political environment	86.5	16	
1.1.1	Political stability*	88.4	19	
1.1.2	Government effectiveness*	84.5	13	
1.2	Regulatory environment	90.6	16	
1.2.1	Regulatory quality*	77.2	25	
1.2.2	Rule of law*	85.1	19	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	82.4	21	
1.3.1	Ease of starting a business*	86.2	69	
1.3.2	Ease of resolving insolvency*	93.7	2	●
1.3.3	Ease of paying taxes*	67.2	96	○
2	**Human capital & research**	**55.0**	**13**	
2.1	Education	51.6	43	
2.1.1	Expenditure on education, % GDP	3.8	88	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	25.8	35	
2.1.3	School life expectancy, years	15.3	36	
2.1.4	PISA scales in reading, maths, & science	540.4	5	
2.1.5	Pupil-teacher ratio, secondary	11.7	40	
2.2	Tertiary education	37.0	55	
2.2.1	Tertiary enrolment, % gross	61.5	39	
2.2.2	Graduates in science & engineering, %	20.3	54	
2.2.3	Tertiary inbound mobility, %	3.9	47	
2.3	Research & development (R&D)	76.3	6	●
2.3.1	Researchers, FTE/mn pop.	5194.8	9	
2.3.2	Gross expenditure on R&D, % GDP	3.5	3	●
2.3.3	QS university ranking, average score top 3*	83.7	7	
3	**Infrastructure**	**63.1**	**5**	●
3.1	Information & communication technologies (ICTs)	88.1	4	●
3.1.1	ICT access*	84.0	14	
3.1.2	ICT use*	78.0	7	
3.1.3	Government's online service*	94.5	4	●
3.1.4	E-participation*	96.1	4	●
3.2	General infrastructure	48.2	19	
3.2.1	Electricity output, kWh/cap	8257.7	20	
3.2.2	Logistics performance*	89.4	10	
3.2.3	Gross capital formation, % GDP	22.2	65	
3.3	Ecological sustainability	52.8	19	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	8.9	42	
3.3.2	Environmental performance*	72.4	26	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	5.1	19	
4	**Market sophistication**	**64.3**	**12**	
4.1	Credit	56.0	16	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	188.3	5	●
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	44.1	43	
4.2.1	Ease of protecting investors*	62.5	34	
4.2.2	Market capitalization, % GDP	61.8	30	
4.2.3	Total value of stocks traded, % GDP	60.5	14	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	33	
4.3	Trade & competition	92.7	3	●
4.3.1	Applied tariff rate, weighted mean, %	1.2	37	
4.3.2	Intensity of local competition†	89.5	1	●
5	**Business sophistication**	**50.4**	**16**	
5.1	Knowledge workers	62.8	16	
5.1.1	Knowledge-intensive employment, %	24.3	62	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	2.7	3	●
5.1.4	GERD financed by business, %	75.5	2	●
5.1.5	Females employed w/advanced degrees, % total	19.3	24	
5.2	Innovation linkages	46.6	21	
5.2.1	University/industry research collaboration†	66.7	15	
5.2.2	State of cluster development†	71.4	7	
5.2.3	GERD financed by abroad, %	0.5	95	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	38	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	5.2	2	●
5.3	Knowledge absorption	41.8	34	
5.3.1	Royalty & license fees payments, % total trade	2.0	8	
5.3.2	High-tech imports less re-imports, % total trade	14.0	17	
5.3.3	Comm., computer & info. services imp., % total trade	0.7	77	○
5.3.4	FDI net inflows, % GDP	0.1	128	○
6	**Knowledge & technology outputs**	**48.6**	**14**	
6.1	Knowledge creation	56.3	10	
6.1.1	Domestic resident patent app./bn PPP$ GDP	58.0	1	●
6.1.2	PCT resident patent app./bn PPP$ GDP	8.9	1	●
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.3	21	
6.1.4	Scientific & technical articles/bn PPP$ GDP	15.6	49	
6.1.5	Citable documents H index	694.0	6	●
6.2	Knowledge impact	39.4	59	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.5	60	
6.2.2	New businesses/th pop. 15–64	1.2	62	○
6.2.3	Computer software spending, % GDP	0.3	38	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	9.8	42	
6.2.5	High- & medium-high-tech manufactures, % ④	43.6	13	
6.3	Knowledge diffusion	50.0	14	
6.3.1	Royalty & license fees receipts, % total trade	3.5	5	●
6.3.2	High-tech exports less re-exports, % total trade	12.4	16	
6.3.3	Comm., computer & info. services exp., % total trade	0.3	105	○
6.3.4	FDI net outflows, % GDP	2.8	23	
7	**Creative outputs**	**39.6**	**43**	
7.1	Intangible assets	44.8	73	
7.1.1	Domestic res trademark app./bn PPP$ GDP	33.8	67	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.4	42	○
7.1.3	ICTs & business model creation†	73.1	14	
7.1.4	ICTs & organizational model creation†	60.6	37	
7.2	Creative goods & services	35.9	24	
7.2.1	Cultural & creative services exports, % total trade	0.0	71	○
7.2.2	National feature films/mn pop. 15–69	6.7	30	
7.2.3	Global ent. & media output/th pop. 15–69	65.5	6	
7.2.4	Printing & publishing output manufactures, % ④	2.3	23	
7.2.5	Creative goods exports, % total trade	2.4	20	
7.3	Online creativity	33.1	42	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	18.5	33	
7.3.2	Country-code TLDs/th pop. 15–69	6.7	48	
7.3.3	Wikipedia edits/pop. 15–69	3292.1	40	
7.3.4	Video uploads on YouTube/pop. 15–69	82.7	28	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
④ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Jordan

Key indicators

Population (millions)	7.5
GDP (US$ billions)	35.8
GDP per capita, PPP$	6,281.5
Income group	Upper-middle income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**33.8**	**75**	
Innovation Output Sub-Index		28.3	67	
Innovation Input Sub-Index		39.3	80	
Innovation Efficiency Ratio		0.7	68	
Global Innovation Index 2014 (out of 143)		36.2	64	
1	**Institutions**	**62.2**	**65**	
1.1	Political environment	43.6	85	
1.1.1	Political stability*	48.9	102	
1.1.2	Government effectiveness*	38.4	78	
1.2	Regulatory environment	77.2	36	●
1.2.1	Regulatory quality*	50.9	66	
1.2.2	Rule of law*	57.9	49	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	65.7	80	
1.3.1	Ease of starting a business*	85.6	72	
1.3.2	Ease of resolving insolvency*	30.2	123	○
1.3.3	Ease of paying taxes*	81.2	40	●
2	**Human capital & research**	**26.3**	**81**	
2.1	Education	31.7	111	○
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	15.1	86	○
2.1.3	School life expectancy, years	13.5	70	
2.1.4	PISA scales in reading, maths, & science	398.0	54	○
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	34.7	60	
2.2.1	Tertiary enrolment, % gross	46.6	56	
2.2.2	Graduates in science & engineering, % ◴	16.1	74	
2.2.3	Tertiary inbound mobility, %	9.1	17	●
2.3	Research & development (R&D)	12.4	61	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP ◴	0.4	67	
2.3.3	QS university ranking, average score top 3*	14.7	58	
3	**Infrastructure**	**36.4**	**81**	
3.1	Information & communication technologies (ICTs)	44.0	75	
3.1.1	ICT access*	54.7	73	
3.1.2	ICT use*	22.2	88	
3.1.3	Government's online service*	52.0	62	
3.1.4	E-participation*	47.1	70	
3.2	General infrastructure	27.1	86	
3.2.1	Electricity output, kWh/cap	2625.9	68	
3.2.2	Logistics performance*	36.4	65	
3.2.3	Gross capital formation, % GDP	21.7	70	
3.3	Ecological sustainability	38.1	68	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	8.4	48	
3.3.2	Environmental performance*	55.8	55	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.5	80	
4	**Market sophistication**	**38.8**	**118**	○
4.1	Credit	9.0	132	○
4.1.1	Ease of getting credit*	0.0	140	○
4.1.2	Domestic credit to private sector, % GDP	72.3	44	
4.1.3	Microfinance gross loans, % GDP	0.4	48	
4.2	Investment	31.6	91	
4.2.1	Ease of protecting investors*	41.7	123	○
4.2.2	Market capitalization, % GDP	87.0	18	●
4.2.3	Total value of stocks traded, % GDP	9.0	41	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	24	
4.3	Trade & competition	75.9	73	
4.3.1	Applied tariff rate, weighted mean, % ◴	5.2	85	
4.3.2	Intensity of local competition†	69.9	55	
5	**Business sophistication**	**32.8**	**76**	
5.1	Knowledge workers	23.5	111	○
5.1.1	Knowledge-intensive employment, % ◴	28.2	48	
5.1.2	Firms offering formal training, % firms	3.4	109	○
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	41.3	36	●
5.2.1	University/industry research collaboration†	47.1	50	
5.2.2	State of cluster development†	58.1	27	●
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	24	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	59	
5.3	Knowledge absorption	33.5	67	
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	5.1	96	
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	5.3	30	●
6	**Knowledge & technology outputs**	**24.0**	**83**	
6.1	Knowledge creation	11.4	65	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.5	75	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	14.9	51	
6.1.5	Citable documents H index	92.0	76	
6.2	Knowledge impact	36.5	75	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.4	25	●
6.2.2	New businesses/th pop. 15–64	1.0	68	
6.2.3	Computer software spending, % GDP	0.3	43	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.5	72	
6.2.5	High- & medium-high-tech manufactures, %	24.5	47	
6.3	Knowledge diffusion	24.1	91	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.4	78	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	0.0	95	○
7	**Creative outputs**	**32.5**	**69**	
7.1	Intangible assets	46.6	62	
7.1.1	Domestic res trademark app./bn PPP$ GDP	27.8	73	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	63.2	39	●
7.1.4	ICTs & organizational model creation†	62.0	29	●
7.2	Creative goods & services	17.5	76	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	1.4	52	○
7.2.4	Printing & publishing output manufactures, %	1.5	49	
7.2.5	Creative goods exports, % total trade	0.8	45	
7.3	Online creativity	19.5	66	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	7.6	50	
7.3.2	Country-code TLDs/th pop. 15–69	0.4	107	○
7.3.3	Wikipedia edits/pop. 15–69	1037.9	73	
7.3.4	Video uploads on YouTube/pop. 15–69	62.6	61	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Kazakhstan

Key indicators

Population (millions)	16.6
GDP (US$ billions)	212.3
GDP per capita, PPP$	15,219.4
Income group	Upper-middle income
Region	Central and Southern Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**31.2**	**82**	
Innovation Output Sub-Index		21.5	107	
Innovation Input Sub-Index		41.0	75	
Innovation Efficiency Ratio		0.5	124	○
Global Innovation Index 2014 (out of 143)		32.8	79	
1	**Institutions**	**61.4**	**67**	
1.1	Political environment	40.8	98	
1.1.1	Political stability*	54.7	88	
1.1.2	Government effectiveness*	26.9	102	
1.2	Regulatory environment	66.3	71	
1.2.1	Regulatory quality*	37.6	103	
1.2.2	Rule of law*	29.9	102	
1.2.3	Cost of redundancy dismissal, salary weeks	8.6	20	●
1.3	Business environment	77.2	35	●
1.3.1	Ease of starting a business*	90.2	46	
1.3.2	Ease of resolving insolvency*	51.5	60	
1.3.3	Ease of paying taxes*	90.0	16	●
2	**Human capital & research**	**29.6**	**66**	
2.1	Education	50.9	49	
2.1.1	Expenditure on education, % GDP◴	3.1	108	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	15.0	43	
2.1.4	PISA scales in reading, maths, & science	416.4	48	
2.1.5	Pupil-teacher ratio, secondary	8.6	13	●
2.2	Tertiary education	21.8	99	
2.2.1	Tertiary enrolment, % gross	44.5	60	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	1.4	77	
2.3	Research & development (R&D)	16.1	52	
2.3.1	Researchers, FTE/mn pop.	763.5	51	
2.3.2	Gross expenditure on R&D, % GDP	0.2	92	
2.3.3	QS university ranking, average score top 3*	35.1	38	
3	**Infrastructure**	**43.3**	**54**	
3.1	Information & communication technologies (ICTs)	65.7	33	●
3.1.1	ICT access*	68.4	49	
3.1.2	ICT use*	43.3	52	
3.1.3	Government's online service*	74.8	23	●
3.1.4	E-participation*	76.5	22	●
3.2	General infrastructure	35.8	54	
3.2.1	Electricity output, kWh/cap	5432.2	38	
3.2.2	Logistics performance*	27.5	83	
3.2.3	Gross capital formation, % GDP	28.4	31	●
3.3	Ecological sustainability	28.3	104	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.3	105	○
3.3.2	Environmental performance*	51.1	75	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	91	
4	**Market sophistication**	**43.4**	**96**	
4.1	Credit	20.9	108	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	35.6	90	
4.1.3	Microfinance gross loans, % GDP	0.2	57	
4.2	Investment	34.8	71	
4.2.1	Ease of protecting investors*	65.8	25	●
4.2.2	Market capitalization, % GDP	11.5	87	
4.2.3	Total value of stocks traded, % GDP	0.5	77	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	74.5	79	
4.3.1	Applied tariff rate, weighted mean, %	3.0	57	
4.3.2	Intensity of local competition†	59.3	107	
5	**Business sophistication**	**27.2**	**110**	
5.1	Knowledge workers	38.0	68	
5.1.1	Knowledge-intensive employment, %	32.3	41	
5.1.2	Firms offering formal training, % firms	28.4	67	
5.1.3	GERD performed by business, % of GDP	0.1	69	
5.1.4	GERD financed by business, %	28.9	52	
5.1.5	Females employed w/advanced degrees, % total	17.6	29	
5.2	Innovation linkages	18.8	128	○
5.2.1	University/industry research collaboration†	38.2	85	
5.2.2	State of cluster development†	36.2	112	
5.2.3	GERD financed by abroad, %	0.8	92	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	98	○
5.3	Knowledge absorption	24.9	115	
5.3.1	Royalty & license fees payments, % total trade	0.2	86	
5.3.2	High-tech imports less re-imports, % total trade	6.8	69	
5.3.3	Comm., computer & info. services imp., % total trade	0.4	101	
5.3.4	FDI net inflows, % GDP	4.3	36	●
6	**Knowledge & technology outputs**	**21.9**	**96**	
6.1	Knowledge creation	8.7	80	
6.1.1	Domestic resident patent app./bn PPP$ GDP	4.6	24	●
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	80	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.3	42	
6.1.4	Scientific & technical articles/bn PPP$ GDP	1.6	130	○
6.1.5	Citable documents H index	59.0	107	
6.2	Knowledge impact	36.6	70	
6.2.1	Growth rate of PPP$ GDP/worker, %	4.2	13	●
6.2.2	New businesses/th pop. 15–64	1.7	51	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.3	108	
6.2.5	High- & medium-high-tech manufactures, %◴	6.8	87	○
6.3	Knowledge diffusion	20.4	109	
6.3.1	Royalty & license fees receipts, % total trade	0.0	111	○
6.3.2	High-tech exports less re-exports, % total trade	4.1	36	
6.3.3	Comm., computer & info. services exp., % total trade	0.2	111	○
6.3.4	FDI net outflows, % GDP	0.8	55	
7	**Creative outputs**	**21.1**	**117**	
7.1	Intangible assets	33.5	121	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	17.8	90	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.1	55	
7.1.3	ICTs & business model creation†	54.4	72	
7.1.4	ICTs & organizational model creation†	52.8	63	
7.2	Creative goods & services	13.6	86	
7.2.1	Cultural & creative services exports, % total trade	0.0	81	○
7.2.2	National feature films/mn pop. 15–69	3.0	51	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	1.7	36	
7.2.5	Creative goods exports, % total trade	0.3	70	
7.3	Online creativity	3.9	97	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.4	119	○
7.3.2	Country-code TLDs/th pop. 15–69	4.4	55	
7.3.3	Wikipedia edits/pop. 15–69	919.7	80	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Kenya

Key indicators

Population (millions)	45.5
GDP (US$ billions)	60.8
GDP per capita, PPP$	1,903.4
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**30.2**	**92**	
Innovation Output Sub-Index		26.6	78	
Innovation Input Sub-Index		33.7	113	
Innovation Efficiency Ratio		0.8	30	●
Global Innovation Index 2014 (out of 143)		31.9	85	
1	**Institutions**	**52.7**	**96**	
1.1	Political environment	32.0	118	
1.1.1	Political stability*	35.8	121	
1.1.2	Government effectiveness*	28.2	99	
1.2	Regulatory environment	66.6	70	
1.2.1	Regulatory quality*	38.4	99	
1.2.2	Rule of law*	27.8	107	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	59.6	106	
1.3.1	Ease of starting a business*	74.0	115	
1.3.2	Ease of resolving insolvency*	33.3	116	
1.3.3	Ease of paying taxes*	71.5	80	
2	**Human capital & research**	**14.7**	**125**	
2.1	Education	31.2	115	
2.1.1	Expenditure on education, % GDP◴	6.6	19	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	21.2	52	
2.1.3	School life expectancy, years◴	11.0	106	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	41.1	119	○
2.2	Tertiary education	2.8	135	○
2.2.1	Tertiary enrolment, % gross◴	4.0	128	○
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	10.1	69	
2.3.1	Researchers, FTE/mn pop.◴	227.5	67	
2.3.2	Gross expenditure on R&D, % GDP◴	1.0	35	
2.3.3	QS university ranking, average score top 3*	4.9	69	
3	**Infrastructure**	**27.2**	**110**	
3.1	Information & communication technologies (ICTs)	38.6	87	
3.1.1	ICT access*	32.9	110	
3.1.2	ICT use*	14.1	104	
3.1.3	Government's online service*	42.5	77	
3.1.4	E-participation*	64.7	33	
3.2	General infrastructure	20.9	115	
3.2.1	Electricity output, kWh/cap	192.0	116	○
3.2.2	Logistics performance*	33.2	71	
3.2.3	Gross capital formation, % GDP	19.6	95	
3.3	Ecological sustainability	22.1	127	○
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.0	110	○
3.3.2	Environmental performance*	37.0	117	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	89	
4	**Market sophistication**	**42.9**	**98**	
4.1	Credit	33.4	59	
4.1.1	Ease of getting credit*	35.0	102	
4.1.2	Domestic credit to private sector, % GDP	31.6	95	
4.1.3	Microfinance gross loans, % GDP	4.7	12	●
4.2	Investment	25.0	124	
4.2.1	Ease of protecting investors*	45.8	107	
4.2.2	Market capitalization, % GDP	29.4	57	
4.2.3	Total value of stocks traded, % GDP	2.0	60	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	23	
4.3	Trade & competition	70.4	94	
4.3.1	Applied tariff rate, weighted mean, %	10.5	124	
4.3.2	Intensity of local competition†	77.6	19	●
5	**Business sophistication**	**31.2**	**86**	
5.1	Knowledge workers	26.6	101	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms	40.6	45	
5.1.3	GERD performed by business, % of GDP◴	0.1	61	
5.1.4	GERD financed by business, %◴	4.3	76	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	41.3	37	●
5.2.1	University/industry research collaboration†	53.6	35	●
5.2.2	State of cluster development†	53.3	38	
5.2.3	GERD financed by abroad, %◴	47.1	9	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	72	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	84	
5.3	Knowledge absorption	25.8	110	
5.3.1	Royalty & license fees payments, % total trade◴	0.2	83	
5.3.2	High-tech imports less re-imports, % total trade	10.9	27	●
5.3.3	Comm., computer & info. services imp., % total trade◴	0.1	122	○
5.3.4	FDI net inflows, % GDP	1.2	107	
6	**Knowledge & technology outputs**	**24.2**	**82**	
6.1	Knowledge creation	10.0	69	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.0	60	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	68	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.6	35	
6.1.4	Scientific & technical articles/bn PPP$ GDP	11.5	64	
6.1.5	Citable documents H index	149.0	48	
6.2	Knowledge impact	31.2	100	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.1	27	●
6.2.2	New businesses/th pop. 15–64◴	0.8	77	
6.2.3	Computer software spending, % GDP	0.2	67	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	4.8	65	
6.2.5	High- & medium-high-tech manufactures, %	7.7	84	
6.3	Knowledge diffusion	31.3	52	
6.3.1	Royalty & license fees receipts, % total trade◴	0.2	33	
6.3.2	High-tech exports less re-exports, % total trade	0.6	74	
6.3.3	Comm., computer & info. services exp., % total trade◴	3.4	15	●
6.3.4	FDI net outflows, % GDP◴	0.0	98	
7	**Creative outputs**	**29.1**	**85**	
7.1	Intangible assets	48.2	58	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.0	64	○
7.1.3	ICTs & business model creation†	63.9	37	●
7.1.4	ICTs & organizational model creation†	56.3	55	
7.2	Creative goods & services	12.1	91	
7.2.1	Cultural & creative services exports, % total trade	0.0	87	○
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	1.3	53	○
7.2.4	Printing & publishing output manufactures, %	1.8	34	
7.2.5	Creative goods exports, % total trade	0.3	71	
7.3	Online creativity	8.0	83	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.3	103	
7.3.2	Country-code TLDs/th pop. 15–69	0.7	93	
7.3.3	Wikipedia edits/pop. 15–69	107.0	113	
7.3.4	Video uploads on YouTube/pop. 15–69	29.2	71	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Korea, Republic of

Key indicators

Population (millions)	49.5
GDP (US$ billions)	1,416.9
GDP per capita, PPP$	34,795.4
Income group	High income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**56.3**	**14**	
Innovation Output Sub-Index		50.1	11	
Innovation Input Sub-Index		62.4	15	
Innovation Efficiency Ratio		0.8	27	
Global Innovation Index 2014 (out of 143)		55.3	16	
1	**Institutions**	**76.1**	**33**	
1.1	Political environment	70.9	38	
1.1.1	Political stability*	70.0	52	
1.1.2	Government effectiveness*	71.7	30	
1.2	Regulatory environment	67.4	66	
1.2.1	Regulatory quality*	73.9	30	
1.2.2	Rule of law*	72.6	33	
1.2.3	Cost of redundancy dismissal, salary weeks	27.4	118	○
1.3	Business environment	90.2	4	●
1.3.1	Ease of starting a business*	94.4	16	
1.3.2	Ease of resolving insolvency*	90.1	5	●
1.3.3	Ease of paying taxes*	86.1	24	
2	**Human capital & research**	**64.8**	**2**	●
2.1	Education	53.9	35	
2.1.1	Expenditure on education, % GDP	4.9	64	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	23.0	47	
2.1.3	School life expectancy, years	16.9	12	
2.1.4	PISA scales in reading, maths, & science	542.4	4	
2.1.5	Pupil-teacher ratio, secondary	15.9	68	
2.2	Tertiary education	54.8	10	
2.2.1	Tertiary enrolment, % gross	98.4	2	●
2.2.2	Graduates in science & engineering, %	31.1	8	
2.2.3	Tertiary inbound mobility, %	1.8	71	○
2.3	Research & development (R&D)	85.7	2	●
2.3.1	Researchers, FTE/mn pop.	6533.2	5	
2.3.2	Gross expenditure on R&D, % GDP	4.2	2	●
2.3.3	QS university ranking, average score top 3*	79.8	10	
3	**Infrastructure**	**62.4**	**8**	
3.1	Information & communication technologies (ICTs)	92.4	1	●
3.1.1	ICT access*	89.4	8	
3.1.2	ICT use*	82.6	3	●
3.1.3	Government's online service*	97.6	3	●
3.1.4	E-participation*	100.0	1	●
3.2	General infrastructure	55.5	12	
3.2.1	Electricity output, kWh/cap	10643.9	11	
3.2.2	Logistics performance*	76.8	20	
3.2.3	Gross capital formation, % GDP	28.9	27	
3.3	Ecological sustainability	39.4	61	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	5.5	93	○
3.3.2	Environmental performance*	63.8	42	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.8	36	
4	**Market sophistication**	**63.3**	**16**	
4.1	Credit	54.5	17	
4.1.1	Ease of getting credit*	65.0	34	
4.1.2	Domestic credit to private sector, % GDP	135.0	18	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	59.9	9	
4.2.1	Ease of protecting investors*	66.7	21	
4.2.2	Market capitalization, % GDP	96.5	15	
4.2.3	Total value of stocks traded, % GDP	123.8	1	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	38	
4.3	Trade & competition	75.5	76	
4.3.1	Applied tariff rate, weighted mean, %	8.7	115	○
4.3.2	Intensity of local competition†	81.5	11	
5	**Business sophistication**	**45.2**	**30**	
5.1	Knowledge workers	59.9	22	
5.1.1	Knowledge-intensive employment, %	21.3	67	
5.1.2	Firms offering formal training, % firms	39.5	47	
5.1.3	GERD performed by business, % of GDP	3.3	2	●
5.1.4	GERD financed by business, %	75.7	1	●
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	40.1	44	
5.2.1	University/industry research collaboration†	60.3	25	
5.2.2	State of cluster development†	55.8	29	
5.2.3	GERD financed by abroad, %	0.3	96	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	41	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	4.4	3	●
5.3	Knowledge absorption	35.6	61	
5.3.1	Royalty & license fees payments, % total trade	1.5	17	
5.3.2	High-tech imports less re-imports, % total trade	12.7	21	
5.3.3	Comm., computer & info. services imp., % total trade	0.4	108	○
5.3.4	FDI net inflows, % GDP	0.9	114	○
6	**Knowledge & technology outputs**	**56.7**	**5**	●
6.1	Knowledge creation	78.6	1	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	94.3	1	●
6.1.2	PCT resident patent app./bn PPP$ GDP	7.4	7	
6.1.3	Domestic res utility model app./bn PPP$ GDP	6.2	6	
6.1.4	Scientific & technical articles/bn PPP$ GDP	29.8	26	
6.1.5	Citable documents H index	375.0	19	
6.2	Knowledge impact	42.4	47	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.7	50	
6.2.2	New businesses/th pop. 15–64	2.0	46	
6.2.3	Computer software spending, % GDP	0.3	32	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	6.7	53	
6.2.5	High- & medium-high-tech manufactures, %	53.4	6	
6.3	Knowledge diffusion	49.1	19	
6.3.1	Royalty & license fees receipts, % total trade	0.6	21	
6.3.2	High-tech exports less re-exports, % total trade	22.1	5	
6.3.3	Comm., computer & info. services exp., % total trade	0.3	106	○
6.3.4	FDI net outflows, % GDP	2.2	31	
7	**Creative outputs**	**43.6**	**28**	
7.1	Intangible assets	56.8	19	
7.1.1	Domestic res trademark app./bn PPP$ GDP	93.1	16	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.4	44	○
7.1.3	ICTs & business model creation†	74.6	12	
7.1.4	ICTs & organizational model creation†	67.7	19	
7.2	Creative goods & services	26.0	49	
7.2.1	Cultural & creative services exports, % total trade	0.3	41	
7.2.2	National feature films/mn pop. 15–69	5.5	36	
7.2.3	Global ent. & media output/th pop. 15–69	36.8	19	
7.2.4	Printing & publishing output manufactures, %	0.5	90	○
7.2.5	Creative goods exports, % total trade	2.6	15	
7.3	Online creativity	34.7	41	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	9.5	46	
7.3.2	Country-code TLDs/th pop. 15–69	10.2	44	
7.3.3	Wikipedia edits/pop. 15–69	4407.7	33	
7.3.4	Video uploads on YouTube/pop. 15–69	86.5	21	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Kuwait

Key indicators

Population (millions)	3.5
GDP (US$ billions)	172.4
GDP per capita, PPP$	40,222.7
Income group	High income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**33.2**	**77**	
Innovation Output Sub-Index		28.0	70	
Innovation Input Sub-Index		38.4	87	
Innovation Efficiency Ratio		0.7	65	
Global Innovation Index 2014 (out of 143)		35.2	69	
1	**Institutions**	**58.7**	**76**	
1.1	Political environment	53.5	62	
1.1.1	Political stability*	67.7	58	
1.1.2	Government effectiveness*	39.4	73	
1.2	Regulatory environment	56.0	99	
1.2.1	Regulatory quality*	45.5	77	
1.2.2	Rule of law*	57.9	48	
1.2.3	Cost of redundancy dismissal, salary weeks	28.1	124	○
1.3	Business environment	66.6	79	
1.3.1	Ease of starting a business*	71.3	120	
1.3.2	Ease of resolving insolvency*	36.0	111	
1.3.3	Ease of paying taxes*	92.5	11	●
2	**Human capital & research**	**24.1**	**89**	
2.1	Education	45.6	65	
2.1.1	Expenditure on education, % GDP◴	3.8	94	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	20.9	55	
2.1.3	School life expectancy, years◴	14.6	46	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	8.2	8	●
2.2	Tertiary education	23.9	91	
2.2.1	Tertiary enrolment, % gross	28.5	79	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	2.8	96	
2.3.1	Researchers, FTE/mn pop.◴	135.1	80	
2.3.2	Gross expenditure on R&D, % GDP◴	0.1	107	○
2.3.3	QS university ranking, average score top 3*	5.0	68	
3	**Infrastructure**	**43.6**	**51**	
3.1	Information & communication technologies (ICTs)	50.3	56	
3.1.1	ICT access*	n/a	n/a	
3.1.2	ICT use*	n/a	n/a	
3.1.3	Government's online service*	57.5	52	
3.1.4	E-participation*	43.1	76	
3.2	General infrastructure	42.1	37	●
3.2.1	Electricity output, kWh/cap	19278.5	1	●
3.2.2	Logistics performance*	43.4	54	
3.2.3	Gross capital formation, % GDP	13.9	132	○
3.3	Ecological sustainability	38.5	65	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.0	63	
3.3.2	Environmental performance*	63.9	41	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	98	
4	**Market sophistication**	**43.7**	**93**	
4.1	Credit	26.1	85	
4.1.1	Ease of getting credit*	35.0	102	
4.1.2	Domestic credit to private sector, % GDP◴	55.8	58	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	33.4	76	
4.2.1	Ease of protecting investors*	60.8	41	●
4.2.2	Market capitalization, % GDP	55.8	33	●
4.2.3	Total value of stocks traded, % GDP	13.2	34	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	71	○
4.3	Trade & competition	71.6	91	
4.3.1	Applied tariff rate, weighted mean, %	4.4	74	
4.3.2	Intensity of local competition†	58.5	110	
5	**Business sophistication**	**22.1**	**132**	○
5.1	Knowledge workers	21.1	119	
5.1.1	Knowledge-intensive employment, %◴	18.7	79	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	1.4	83	○
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	22.8	112	
5.2.1	University/industry research collaboration†	35.1	105	
5.2.2	State of cluster development†	44.5	78	
5.2.3	GERD financed by abroad, %◴	1.2	87	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	29	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	99	
5.3	Knowledge absorption	22.3	130	○
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	3.8	114	○
5.3.3	Comm., computer & info. services imp., % total trade	0.5	92	
5.3.4	FDI net inflows, % GDP◴	1.6	96	
6	**Knowledge & technology outputs**	**27.0**	**63**	
6.1	Knowledge creation	5.9	97	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.4	123	
6.1.5	Citable documents H index	92.0	76	
6.2	Knowledge impact	25.4	119	
6.2.1	Growth rate of PPP$ GDP/worker, %	-1.1	113	○
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.3	42	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.7	101	
6.2.5	High- & medium-high-tech manufactures, %	10.5	77	
6.3	Knowledge diffusion	49.8	17	●
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.1	105	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	5.5	8	●
7	**Creative outputs**	**28.9**	**86**	
7.1	Intangible assets	39.3	94	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	39.0	122	○
7.1.4	ICTs & organizational model creation†	39.6	118	○
7.2	Creative goods & services	11.9	94	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	19.8	26	
7.2.4	Printing & publishing output manufactures, %	0.6	85	
7.2.5	Creative goods exports, % total trade	0.4	66	
7.3	Online creativity	25.1	52	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	11.0	42	●
7.3.2	Country-code TLDs/th pop. 15–69	0.6	97	
7.3.3	Wikipedia edits/pop. 15–69	1452.2	68	
7.3.4	Video uploads on YouTube/pop. 15–69	78.0	40	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Kyrgyzstan

Key indicators

Population (millions)	5.6
GDP (US$ billions)	7.4
GDP per capita, PPP$	2,740.3
Income group	Lower-middle income
Region	Central and Southern Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**28.0**	**109**	
Innovation Output Sub-Index		19.4	118	
Innovation Input Sub-Index		36.6	94	
Innovation Efficiency Ratio		0.5	122	
Global Innovation Index 2014 (out of 143)		27.8	112	
1	**Institutions**	**49.4**	**105**	
1.1	Political environment	32.2	117	
1.1.1	Political stability*	41.6	113	
1.1.2	Government effectiveness*	22.7	111	
1.2	Regulatory environment	54.9	103	
1.2.1	Regulatory quality*	39.1	94	
1.2.2	Rule of law*	17.3	130	
1.2.3	Cost of redundancy dismissal, salary weeks	17.3	78	
1.3	Business environment	61.3	98	
1.3.1	Ease of starting a business*	96.4	9	●
1.3.2	Ease of resolving insolvency*	24.4	132	○
1.3.3	Ease of paying taxes*	63.2	104	
2	**Human capital & research**	**28.7**	**70**	
2.1	Education	55.5	27	●
2.1.1	Expenditure on education, % GDP	6.8	16	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years◴	12.5	84	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	15.2	65	
2.2	Tertiary education	28.9	77	
2.2.1	Tertiary enrolment, % gross	47.6	54	
2.2.2	Graduates in science & engineering, %	15.6	79	
2.2.3	Tertiary inbound mobility, %	4.0	45	
2.3	Research & development (R&D)	1.7	107	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP◴	0.2	98	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**26.0**	**114**	
3.1	Information & communication technologies (ICTs)	31.3	102	
3.1.1	ICT access*	40.5	100	
3.1.2	ICT use*	15.9	101	
3.1.3	Government's online service*	27.6	111	
3.1.4	E-participation*	41.2	79	
3.2	General infrastructure	24.7	101	
3.2.1	Electricity output, kWh/cap	2703.7	67	
3.2.2	Logistics performance*	2.5	129	○
3.2.3	Gross capital formation, % GDP	27.2	35	●
3.3	Ecological sustainability	22.0	128	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	3.4	113	
3.3.2	Environmental performance*	40.6	105	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	132	○
4	**Market sophistication**	**49.8**	**56**	
4.1	Credit	41.8	41	●
4.1.1	Ease of getting credit*	65.0	34	●
4.1.2	Domestic credit to private sector, % GDP◴	15.1	129	○
4.1.3	Microfinance gross loans, % GDP	4.8	10	●
4.2	Investment	31.6	92	
4.2.1	Ease of protecting investors*	62.5	34	●
4.2.2	Market capitalization, % GDP	2.5	106	○
4.2.3	Total value of stocks traded, % GDP	0.1	100	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	75.9	74	
4.3.1	Applied tariff rate, weighted mean, %	2.4	50	
4.3.2	Intensity of local competition†	60.1	103	
5	**Business sophistication**	**28.9**	**99**	
5.1	Knowledge workers	42.8	51	
5.1.1	Knowledge-intensive employment, %	17.3	83	
5.1.2	Firms offering formal training, % firms	63.5	7	●
5.1.3	GERD performed by business, % of GDP◴	0.0	74	
5.1.4	GERD financed by business, %◴	38.6	39	
5.1.5	Females employed w/advanced degrees, % total	10.8	57	
5.2	Innovation linkages	17.5	131	○
5.2.1	University/industry research collaboration†	26.2	125	○
5.2.2	State of cluster development†	32.6	124	○
5.2.3	GERD financed by abroad, %◴	0.9	90	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.1	48	
5.3	Knowledge absorption	26.5	108	
5.3.1	Royalty & license fees payments, % total trade◴	0.2	93	
5.3.2	High-tech imports less re-imports, % total trade	5.3	93	
5.3.3	Comm., computer & info. services imp., % total trade	0.4	100	
5.3.4	FDI net inflows, % GDP	10.5	11	●
6	**Knowledge & technology outputs**	**23.2**	**88**	
6.1	Knowledge creation	11.5	64	
6.1.1	Domestic resident patent app./bn PPP$ GDP	6.1	14	●
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	76	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.4	38	
6.1.4	Scientific & technical articles/bn PPP$ GDP	4.4	104	
6.1.5	Citable documents H index	35.0	131	○
6.2	Knowledge impact	40.7	53	
6.2.1	Growth rate of PPP$ GDP/worker, %	6.5	2	●
6.2.2	New businesses/th pop. 15–64	0.9	69	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.3	135	○
6.2.5	High- & medium-high-tech manufactures, %◴	3.3	93	
6.3	Knowledge diffusion	17.4	122	
6.3.1	Royalty & license fees receipts, % total trade◴	0.1	68	
6.3.2	High-tech exports less re-exports, % total trade	0.1	98	
6.3.3	Comm., computer & info. services exp., % total trade	0.4	97	
6.3.4	FDI net outflows, % GDP	0.0	106	
7	**Creative outputs**	**15.5**	**132**	○
7.1	Intangible assets	26.9	131	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	17.9	89	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.2	52	
7.1.3	ICTs & business model creation†	43.9	116	
7.1.4	ICTs & organizational model creation†	39.6	117	
7.2	Creative goods & services	7.1	109	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	0.5	93	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	1.0	73	
7.2.5	Creative goods exports, % total trade	0.1	102	
7.3	Online creativity	1.1	112	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.3	122	
7.3.2	Country-code TLDs/th pop. 15–69	0.6	98	
7.3.3	Wikipedia edits/pop. 15–69	332.1	99	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Latvia

Key indicators

Population (millions)	2.0
GDP (US$ billions)	32.0
GDP per capita, PPP$	20,204.4
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**45.5**	**33**	
Innovation Output Sub-Index		40.6	30	
Innovation Input Sub-Index		50.4	34	
Innovation Efficiency Ratio		0.8	26	
Global Innovation Index 2014 (out of 143)		44.8	34	
1	**Institutions**	**77.7**	**31**	
1.1	Political environment	71.8	36	
1.1.1	Political stability*	78.3	41	
1.1.2	Government effectiveness*	65.2	35	
1.2	Regulatory environment	80.7	28	
1.2.1	Regulatory quality*	75.1	29	
1.2.2	Rule of law*	67.5	37	
1.2.3	Cost of redundancy dismissal, salary weeks	13.0	50	
1.3	Business environment	80.6	25	
1.3.1	Ease of starting a business*	92.1	31	
1.3.2	Ease of resolving insolvency*	63.4	38	
1.3.3	Ease of paying taxes*	86.2	23	
2	**Human capital & research**	**33.1**	**54**	
2.1	Education	52.6	38	
2.1.1	Expenditure on education, % GDP	4.9	62	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	25.8	34	
2.1.3	School life expectancy, years	15.2	38	
2.1.4	PISA scales in reading, maths, & science	493.8	24	
2.1.5	Pupil-teacher ratio, secondary	7.9	6	●
2.2	Tertiary education	34.9	58	
2.2.1	Tertiary enrolment, % gross	65.1	30	
2.2.2	Graduates in science & engineering, %	18.8	62	○
2.2.3	Tertiary inbound mobility, %	2.8	57	
2.3	Research & development (R&D)	11.7	65	
2.3.1	Researchers, FTE/mn pop.	1768.0	38	
2.3.2	Gross expenditure on R&D, % GDP	0.6	55	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**50.6**	**31**	
3.1	Information & communication technologies (ICTs)	68.2	30	
3.1.1	ICT access*	72.9	38	
3.1.2	ICT use*	59.1	28	
3.1.3	Government's online service*	70.1	28	
3.1.4	E-participation*	70.6	24	
3.2	General infrastructure	35.3	56	
3.2.1	Electricity output, kWh/cap	3038.4	62	
3.2.2	Logistics performance*	63.3	35	
3.2.3	Gross capital formation, % GDP	22.5	58	
3.3	Ecological sustainability	48.4	33	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.2	61	
3.3.2	Environmental performance*	64.1	39	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	6.4	18	●
4	**Market sophistication**	**52.4**	**44**	
4.1	Credit	44.5	36	
4.1.1	Ease of getting credit*	70.0	22	
4.1.2	Domestic credit to private sector, % GDP	60.7	55	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	26.0	117	○
4.2.1	Ease of protecting investors*	60.0	47	
4.2.2	Market capitalization, % GDP	3.9	104	○
4.2.3	Total value of stocks traded, % GDP	0.1	98	○
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	36	
4.3	Trade & competition	86.7	17	●
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	76.8	21	
5	**Business sophistication**	**38.2**	**46**	
5.1	Knowledge workers	41.6	58	
5.1.1	Knowledge-intensive employment, %	39.2	25	
5.1.2	Firms offering formal training, % firms	25.2	77	○
5.1.3	GERD performed by business, % of GDP	0.2	52	
5.1.4	GERD financed by business, %	21.8	58	○
5.1.5	Females employed w/advanced degrees, % total	23.0	13	●
5.2	Innovation linkages	40.4	41	
5.2.1	University/industry research collaboration†	44.5	61	
5.2.2	State of cluster development†	41.7	87	○
5.2.3	GERD financed by abroad, %	51.6	4	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	54	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.1	43	
5.3	Knowledge absorption	32.7	70	
5.3.1	Royalty & license fees payments, % total trade	0.3	79	○
5.3.2	High-tech imports less re-imports, % total trade	7.6	57	
5.3.3	Comm., computer & info. services imp., % total trade	1.3	44	
5.3.4	FDI net inflows, % GDP	2.8	66	
6	**Knowledge & technology outputs**	**34.9**	**38**	
6.1	Knowledge creation	18.0	52	
6.1.1	Domestic resident patent app./bn PPP$ GDP	4.8	21	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.6	35	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	12.8	60	
6.1.5	Citable documents H index	94.0	75	
6.2	Knowledge impact	53.6	13	●
6.2.1	Growth rate of PPP$ GDP/worker, %	2.0	44	
6.2.2	New businesses/th pop. 15–64	11.6	9	●
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	19.9	20	●
6.2.5	High- & medium-high-tech manufactures, %	14.1	67	○
6.3	Knowledge diffusion	33.0	46	
6.3.1	Royalty & license fees receipts, % total trade	0.1	51	
6.3.2	High-tech exports less re-exports, % total trade	5.8	28	
6.3.3	Comm., computer & info. services exp., % total trade	2.1	37	
6.3.4	FDI net outflows, % GDP	1.3	46	
7	**Creative outputs**	**46.3**	**24**	
7.1	Intangible assets	50.3	46	
7.1.1	Domestic res trademark app./bn PPP$ GDP	53.0	43	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	2.3	8	●
7.1.3	ICTs & business model creation†	58.6	59	
7.1.4	ICTs & organizational model creation†	60.8	35	
7.2	Creative goods & services	45.5	6	●
7.2.1	Cultural & creative services exports, % total trade	1.2	9	●
7.2.2	National feature films/mn pop. 15–69	6.8	28	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	2.3	21	
7.2.5	Creative goods exports, % total trade	3.1	13	●
7.3	Online creativity	39.2	34	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	9.9	45	
7.3.2	Country-code TLDs/th pop. 15–69	32.1	25	
7.3.3	Wikipedia edits/pop. 15–69	3087.0	44	
7.3.4	Video uploads on YouTube/pop. 15–69	92.2	10	●

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Lebanon

Key indicators

Population (millions)	5.0
GDP (US$ billions)	49.9
GDP per capita, PPP$	15,077.6
Income group	Upper-middle income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**33.8**	**74**	
Innovation Output Sub-Index		27.1	76	
Innovation Input Sub-Index		40.5	77	
Innovation Efficiency Ratio		0.7	87	
Global Innovation Index 2014 (out of 143)		33.6	77	
1	**Institutions**	**53.1**	**95**	
1.1	Political environment	26.5	127	○
1.1.1	Political stability*	22.2	137	○
1.1.2	Government effectiveness*	30.8	90	
1.2	Regulatory environment	67.5	65	
1.2.1	Regulatory quality*	45.5	78	
1.2.2	Rule of law*	27.0	111	
1.2.3	Cost of redundancy dismissal, salary weeks	8.7	24	●
1.3	Business environment	65.4	82	
1.3.1	Ease of starting a business*	80.8	97	
1.3.2	Ease of resolving insolvency*	33.0	117	○
1.3.3	Ease of paying taxes*	82.4	35	
2	**Human capital & research**	**38.1**	**42**	
2.1	Education	35.7	96	
2.1.1	Expenditure on education, % GDP	2.6	117	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	5.1	112	○
2.1.3	School life expectancy, years	13.8	64	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	8.2	9	●
2.2	Tertiary education	47.0	25	●
2.2.1	Tertiary enrolment, % gross	47.9	53	
2.2.2	Graduates in science & engineering, %◴	23.3	32	
2.2.3	Tertiary inbound mobility, %	12.8	13	●
2.3	Research & development (R&D)	31.5	32	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	31.5	43	
3	**Infrastructure**	**36.5**	**80**	
3.1	Information & communication technologies (ICTs)	43.2	78	
3.1.1	ICT access*	64.5	58	
3.1.2	ICT use*	43.3	52	
3.1.3	Government's online service*	35.4	91	
3.1.4	E-participation*	29.4	104	
3.2	General infrastructure	29.2	76	
3.2.1	Electricity output, kWh/cap	3346.7	54	
3.2.2	Logistics performance*	28.8	80	
3.2.3	Gross capital formation, % GDP	24.5	49	
3.3	Ecological sustainability	37.0	74	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.1	40	
3.3.2	Environmental performance*	50.2	81	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	87	
4	**Market sophistication**	**42.4**	**100**	
4.1	Credit	22.8	101	
4.1.1	Ease of getting credit*	35.0	102	
4.1.2	Domestic credit to private sector, % GDP	98.6	30	●
4.1.3	Microfinance gross loans, % GDP	0.1	63	
4.2	Investment	25.1	123	○
4.2.1	Ease of protecting investors*	49.2	93	
4.2.2	Market capitalization, % GDP	23.8	63	
4.2.3	Total value of stocks traded, % GDP	0.9	66	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	27	
4.3	Trade & competition	79.2	58	
4.3.1	Applied tariff rate, weighted mean, %◴	4.8	80	
4.3.2	Intensity of local competition†	75.3	28	●
5	**Business sophistication**	**32.6**	**77**	
5.1	Knowledge workers	42.0	55	
5.1.1	Knowledge-intensive employment, %◴	31.9	43	
5.1.2	Firms offering formal training, % firms	26.6	71	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	30.1	79	
5.2.1	University/industry research collaboration†	31.4	115	○
5.2.2	State of cluster development†	37.9	104	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	21	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	65	
5.3	Knowledge absorption	25.7	111	
5.3.1	Royalty & license fees payments, % total trade◴	0.1	107	○
5.3.2	High-tech imports less re-imports, % total trade	2.8	126	○
5.3.3	Comm., computer & info. services imp., % total trade◴	1.1	56	
5.3.4	FDI net inflows, % GDP	6.4	24	●
6	**Knowledge & technology outputs**	**22.4**	**93**	
6.1	Knowledge creation	15.0	60	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	13.1	59	
6.1.5	Citable documents H index	109.0	67	
6.2	Knowledge impact	25.8	118	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	9.8	43	
6.2.5	High- & medium-high-tech manufactures, %◴	22.0	51	
6.3	Knowledge diffusion	26.3	76	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	95	○
6.3.2	High-tech exports less re-exports, % total trade	0.1	100	
6.3.3	Comm., computer & info. services exp., % total trade◴	1.3	66	
6.3.4	FDI net outflows, % GDP	2.7	25	●
7	**Creative outputs**	**31.8**	**73**	
7.1	Intangible assets	34.4	117	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	37.7	127	○
7.1.4	ICTs & organizational model creation†	31.1	130	○
7.2	Creative goods & services	37.9	21	●
7.2.1	Cultural & creative services exports, % total trade	1.3	8	●
7.2.2	National feature films/mn pop. 15–69	4.2	41	
7.2.3	Global ent. & media output/th pop. 15–69	2.9	48	
7.2.4	Printing & publishing output manufactures, %◴	4.2	7	●
7.2.5	Creative goods exports, % total trade◴	0.7	50	
7.3	Online creativity	20.7	64	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	9.0	47	
7.3.2	Country-code TLDs/th pop. 15–69	0.4	106	
7.3.3	Wikipedia edits/pop. 15–69	876.3	81	
7.3.4	Video uploads on YouTube/pop. 15–69	67.1	59	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Lesotho

Key indicators

Population (millions)	2.1
GDP (US$ billions)	2.2
GDP per capita, PPP$	2,410.9
Income group	Lower-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**27.0**	**118**	
Innovation Output Sub-Index		18.0	125	
Innovation Input Sub-Index		35.9	97	
Innovation Efficiency Ratio		0.5	128	
Global Innovation Index 2014 (out of 143)		27.0	117	
1	**Institutions**	**59.3**	**74**	●
1.1	Political environment	51.6	65	●
1.1.1	Political stability*	72.2	51	●
1.1.2	Government effectiveness*	31.1	89	
1.2	Regulatory environment	62.9	79	
1.2.1	Regulatory quality*	38.5	97	
1.2.2	Rule of law*	40.7	75	●
1.2.3	Cost of redundancy dismissal, salary weeks	15.0	65	●
1.3	Business environment	63.4	91	
1.3.1	Ease of starting a business*	82.8	88	
1.3.2	Ease of resolving insolvency*	37.5	107	
1.3.3	Ease of paying taxes*	69.7	86	
2	**Human capital & research**	**25.6**	**85**	
2.1	Education	63.0	8	●
2.1.1	Expenditure on education, % GDP◴	13.0	1	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	51.2	3	●
2.1.3	School life expectancy, years	11.1	104	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	24.7	94	
2.2	Tertiary education	13.8	115	
2.2.1	Tertiary enrolment, % gross	10.8	108	
2.2.2	Graduates in science & engineering, %	12.6	92	
2.2.3	Tertiary inbound mobility, %	0.5	96	
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.◴	5.9	105	○
2.3.2	Gross expenditure on R&D, % GDP◴	0.0	118	○
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**26.8**	**111**	
3.1	Information & communication technologies (ICTs)	16.3	132	○
3.1.1	ICT access*	30.2	117	
3.1.2	ICT use*	5.5	119	
3.1.3	Government's online service*	15.7	126	
3.1.4	E-participation*	13.7	129	○
3.2	General infrastructure	43.3	31	●
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	10.8	119	
3.2.3	Gross capital formation, % GDP	35.6	11	●
3.3	Ecological sustainability	20.8	133	○
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	20.8	138	○
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	n/a	n/a	
4	**Market sophistication**	**41.1**	**107**	
4.1	Credit	15.1	123	
4.1.1	Ease of getting credit*	25.0	125	
4.1.2	Domestic credit to private sector, % GDP	20.2	115	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	49.2	31	
4.2.1	Ease of protecting investors*	49.2	93	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	59.1	130	
4.3.1	Applied tariff rate, weighted mean, %	12.7	132	○
4.3.2	Intensity of local competition†	62.9	90	
5	**Business sophistication**	**26.8**	**114**	
5.1	Knowledge workers	25.6	103	
5.1.1	Knowledge-intensive employment, %	6.8	107	
5.1.2	Firms offering formal training, % firms◴	42.5	40	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %◴	3.4	78	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	28.0	89	
5.2.1	University/industry research collaboration†	36.7	96	
5.2.2	State of cluster development†	47.5	62	●
5.2.3	GERD financed by abroad, %◴	3.4	73	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	26.9	106	
5.3.1	Royalty & license fees payments, % total trade	0.3	78	
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade	0.7	81	
5.3.4	FDI net inflows, % GDP	2.0	84	
6	**Knowledge & technology outputs**	**12.2**	**132**	○
6.1	Knowledge creation	3.6	120	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	4.4	105	
6.1.5	Citable documents H index	23.0	138	○
6.2	Knowledge impact	5.1	131	
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	1.5	56	●
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.2	137	○
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	27.9	67	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade◴	0.3	107	
6.3.4	FDI net outflows, % GDP	0.7	58	●
7	**Creative outputs**	**23.8**	**105**	
7.1	Intangible assets	35.6	112	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	38.3	125	○
7.1.4	ICTs & organizational model creation†	32.8	127	○
7.2	Creative goods & services	n/a	n/a	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	0.2	127	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.2	123	
7.3.2	Country-code TLDs/th pop. 15–69	0.2	113	
7.3.3	Wikipedia edits/pop. 15–69	37.3	127	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Lithuania

Key indicators

Population (millions)	3.0
GDP (US$ billions)	48.2
GDP per capita, PPP$	23,978.1
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**42.3**	**38**	
Innovation Output Sub-Index		34.7	42	
Innovation Input Sub-Index		49.9	35	
Innovation Efficiency Ratio		0.7	74	
Global Innovation Index 2014 (out of 143)		41.0	39	
1	**Institutions**	**73.6**	**39**	
1.1	Political environment	75.3	32	
1.1.1	Political stability*	87.0	25	
1.1.2	Government effectiveness*	63.7	38	
1.2	Regulatory environment	70.2	54	
1.2.1	Regulatory quality*	77.9	24	
1.2.2	Rule of law*	68.7	35	
1.2.3	Cost of redundancy dismissal, salary weeks	24.6	110	○
1.3	Business environment	75.3	46	
1.3.1	Ease of starting a business*	96.2	11	●
1.3.2	Ease of resolving insolvency*	48.5	64	
1.3.3	Ease of paying taxes*	81.2	39	
2	**Human capital & research**	**39.2**	**41**	
2.1	Education	52.4	40	
2.1.1	Expenditure on education, % GDP	5.2	48	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	19.5	60	
2.1.3	School life expectancy, years	16.4	17	●
2.1.4	PISA scales in reading, maths, & science	483.9	32	
2.1.5	Pupil-teacher ratio, secondary	8.3	10	●
2.2	Tertiary education	39.5	47	
2.2.1	Tertiary enrolment, % gross	73.9	20	●
2.2.2	Graduates in science & engineering, %	22.1	36	
2.2.3	Tertiary inbound mobility, %	1.8	70	
2.3	Research & development (R&D)	25.5	37	
2.3.1	Researchers, FTE/mn pop.	2836.3	29	
2.3.2	Gross expenditure on R&D, % GDP	1.0	36	
2.3.3	QS university ranking, average score top 3*	19.9	53	
3	**Infrastructure**	**48.2**	**40**	
3.1	Information & communication technologies (ICTs)	65.8	32	
3.1.1	ICT access*	70.0	47	
3.1.2	ICT use*	52.9	33	
3.1.3	Government's online service*	75.6	21	●
3.1.4	E-participation*	64.7	33	
3.2	General infrastructure	27.3	85	
3.2.1	Electricity output, kWh/cap	1514.7	85	
3.2.2	Logistics performance*	51.9	44	
3.2.3	Gross capital formation, % GDP	19.6	93	
3.3	Ecological sustainability	51.4	25	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.6	54	
3.3.2	Environmental performance*	61.3	46	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	8.5	10	●
4	**Market sophistication**	**51.9**	**48**	
4.1	Credit	42.0	40	
4.1.1	Ease of getting credit*	70.0	22	
4.1.2	Domestic credit to private sector, % GDP	46.2	71	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	26.9	108	○
4.2.1	Ease of protecting investors*	55.0	72	
4.2.2	Market capitalization, % GDP	9.4	91	○
4.2.3	Total value of stocks traded, % GDP	0.4	81	○
4.2.4	Venture capital deals/tr PPP$ GDP	0.2	18	
4.3	Trade & competition	86.9	16	●
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	77.1	20	●
5	**Business sophistication**	**36.4**	**59**	
5.1	Knowledge workers	52.4	33	
5.1.1	Knowledge-intensive employment, %	42.8	19	●
5.1.2	Firms offering formal training, % firms	42.0	42	
5.1.3	GERD performed by business, % of GDP	0.2	45	
5.1.4	GERD financed by business, %	27.4	55	
5.1.5	Females employed w/advanced degrees, % total	26.1	6	●
5.2	Innovation linkages	36.1	55	
5.2.1	University/industry research collaboration†	60.1	26	
5.2.2	State of cluster development†	41.7	86	
5.2.3	GERD financed by abroad, %	37.1	13	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	68	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	58	
5.3	Knowledge absorption	20.9	135	○
5.3.1	Royalty & license fees payments, % total trade	0.1	98	○
5.3.2	High-tech imports less re-imports, % total trade	4.7	103	○
5.3.3	Comm., computer & info. services imp., % total trade	0.5	89	○
5.3.4	FDI net inflows, % GDP	1.6	97	○
6	**Knowledge & technology outputs**	**28.3**	**55**	
6.1	Knowledge creation	17.3	53	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.5	56	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.6	33	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	25.5	34	
6.1.5	Citable documents H index	122.0	58	
6.2	Knowledge impact	44.0	41	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.0	46	
6.2.2	New businesses/th pop. 15–64	4.7	24	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	14.6	27	
6.2.5	High- & medium-high-tech manufactures, %	20.6	55	
6.3	Knowledge diffusion	23.7	96	
6.3.1	Royalty & license fees receipts, % total trade	0.1	66	
6.3.2	High-tech exports less re-exports, % total trade	4.8	32	
6.3.3	Comm., computer & info. services exp., % total trade	0.6	91	○
6.3.4	FDI net outflows, % GDP	0.6	63	
7	**Creative outputs**	**41.0**	**35**	
7.1	Intangible assets	51.0	42	
7.1.1	Domestic res trademark app./bn PPP$ GDP	51.4	46	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.5	22	
7.1.3	ICTs & business model creation†	66.9	26	
7.1.4	ICTs & organizational model creation†	66.3	22	
7.2	Creative goods & services	22.4	58	
7.2.1	Cultural & creative services exports, % total trade	0.3	44	
7.2.2	National feature films/mn pop. 15–69	6.8	29	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	0.9	74	○
7.2.5	Creative goods exports, % total trade	1.5	33	
7.3	Online creativity	39.5	33	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	14.1	37	
7.3.2	Country-code TLDs/th pop. 15–69	32.3	24	
7.3.3	Wikipedia edits/pop. 15–69	3619.1	36	
7.3.4	Video uploads on YouTube/pop. 15–69	84.8	25	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Luxembourg

Key indicators

Population (millions)	0.5
GDP (US$ billions)	62.4
GDP per capita, PPP$	79,977.0
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**59.0**	**9**	
Innovation Output Sub-Index		59.0	2	●
Innovation Input Sub-Index		59.0	20	
Innovation Efficiency Ratio		1.0	3	●
Global Innovation Index 2014 (out of 143)		56.9	9	
1	**Institutions**	**83.5**	**18**	
1.1	Political environment	91.1	8	
1.1.1	Political stability*	97.1	6	
1.1.2	Government effectiveness*	85.1	12	
1.2	Regulatory environment	83.9	22	
1.2.1	Regulatory quality*	94.7	10	
1.2.2	Rule of law*	95.2	9	
1.2.3	Cost of redundancy dismissal, salary weeks	21.7	99	○
1.3	Business environment	75.6	44	
1.3.1	Ease of starting a business*	86.5	68	
1.3.2	Ease of resolving insolvency*	51.8	59	
1.3.3	Ease of paying taxes*	88.6	19	
2	**Human capital & research**	**40.8**	**34**	
2.1	Education	51.1	46	
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	18.3	66	
2.1.3	School life expectancy, years	13.8	61	
2.1.4	PISA scales in reading, maths, & science	489.6	26	
2.1.5	Pupil-teacher ratio, secondary	7.9	4	●
2.2	Tertiary education	42.7	36	
2.2.1	Tertiary enrolment, % gross	19.7	91	
2.2.2	Graduates in science & engineering, %	14.7	84	○
2.2.3	Tertiary inbound mobility, %	40.6	1	●
2.3	Research & development (R&D)	28.8	35	
2.3.1	Researchers, FTE/mn pop.	4930.8	10	
2.3.2	Gross expenditure on R&D, % GDP	1.2	31	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**54.2**	**25**	
3.1	Information & communication technologies (ICTs)	72.1	23	
3.1.1	ICT access*	94.6	1	●
3.1.2	ICT use*	76.6	8	
3.1.3	Government's online service*	62.2	42	
3.1.4	E-participation*	54.9	54	
3.2	General infrastructure	38.5	45	
3.2.1	Electricity output, kWh/cap	3301.8	56	
3.2.2	Logistics performance*	91.1	8	
3.2.3	Gross capital formation, % GDP	18.8	105	○
3.3	Ecological sustainability	52.1	22	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	8.9	43	
3.3.2	Environmental performance*	83.3	2	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.8	50	
4	**Market sophistication**	**56.2**	**31**	
4.1	Credit	34.1	55	
4.1.1	Ease of getting credit*	15.0	129	○
4.1.2	Domestic credit to private sector, % GDP	162.4	11	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	50.9	27	
4.2.1	Ease of protecting investors*	46.7	102	○
4.2.2	Market capitalization, % GDP	125.0	6	
4.2.3	Total value of stocks traded, % GDP	0.2	91	○
4.2.4	Venture capital deals/tr PPP$ GDP	0.7	5	
4.3	Trade & competition	83.7	34	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	70.8	52	
5	**Business sophistication**	**60.2**	**2**	●
5.1	Knowledge workers	61.5	18	
5.1.1	Knowledge-intensive employment, %	59.1	1	●
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	0.7	27	
5.1.4	GERD financed by business, %	20.5	60	
5.1.5	Females employed w/advanced degrees, % total	20.3	22	
5.2	Innovation linkages	57.6	6	
5.2.1	University/industry research collaboration†	65.0	17	
5.2.2	State of cluster development†	64.2	16	
5.2.3	GERD financed by abroad, %◴	20.4	21	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.1	3	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	1.7	10	
5.3	Knowledge absorption	61.7	4	●
5.3.1	Royalty & license fees payments, % total trade	0.9	36	
5.3.2	High-tech imports less re-imports, % total trade	3.9	113	○
5.3.3	Comm., computer & info. services imp., % total trade	3.2	4	●
5.3.4	FDI net inflows, % GDP	49.8	1	●
6	**Knowledge & technology outputs**	**49.1**	**13**	
6.1	Knowledge creation	36.9	25	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.3	44	
6.1.2	PCT resident patent app./bn PPP$ GDP	7.6	6	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	19.3	41	
6.1.5	Citable documents H index	92.0	76	
6.2	Knowledge impact	43.1	44	
6.2.1	Growth rate of PPP$ GDP/worker, %	-0.2	102	○
6.2.2	New businesses/th pop. 15–64	21.0	1	●
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	5.3	61	
6.2.5	High- & medium-high-tech manufactures, %	3.4	92	○
6.3	Knowledge diffusion	67.2	4	●
6.3.1	Royalty & license fees receipts, % total trade	0.9	17	
6.3.2	High-tech exports less re-exports, % total trade	1.0	65	
6.3.3	Comm., computer & info. services exp., % total trade	4.7	7	
6.3.4	FDI net outflows, % GDP	610.0	1	●
7	**Creative outputs**	**69.0**	**2**	●
7.1	Intangible assets	75.5	1	●
7.1.1	Domestic res trademark app./bn PPP$ GDP	122.4	6	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	6.8	1	●
7.1.3	ICTs & business model creation†	76.1	7	
7.1.4	ICTs & organizational model creation†	69.3	16	
7.2	Creative goods & services	43.2	8	
7.2.1	Cultural & creative services exports, % total trade	5.7	1	●
7.2.2	National feature films/mn pop. 15–69◴	42.9	1	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	1.6	42	
7.2.5	Creative goods exports, % total trade	0.2	81	
7.3	Online creativity	81.7	4	●
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	100.0	1	●
7.3.2	Country-code TLDs/th pop. 15–69	90.9	8	
7.3.3	Wikipedia edits/pop. 15–69	7322.3	14	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Madagascar

Key indicators

Population (millions)	23.6
GDP (US$ billions)	10.6
GDP per capita, PPP$	990.5
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**24.4**	**125**	
Innovation Output Sub-Index		18.2	123	
Innovation Input Sub-Index		30.7	123	
Innovation Efficiency Ratio		0.6	116	
Global Innovation Index 2014 (out of 143)		25.5	124	
1	**Institutions**	**52.0**	**99**	
1.1	Political environment	28.8	123	
1.1.1	Political stability*	46.5	106	
1.1.2	Government effectiveness*	11.0	133	
1.2	Regulatory environment	59.2	87	
1.2.1	Regulatory quality*	30.0	114	
1.2.2	Rule of law*	23.8	120	
1.2.3	Cost of redundancy dismissal, salary weeks	12.2	48	●
1.3	Business environment	68.1	75	
1.3.1	Ease of starting a business*	92.0	32	●
1.3.2	Ease of resolving insolvency*	34.4	113	
1.3.3	Ease of paying taxes*	77.8	53	●
2	**Human capital & research**	**15.3**	**120**	
2.1	Education	22.5	130	
2.1.1	Expenditure on education, % GDP	2.7	113	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	8.4	106	
2.1.3	School life expectancy, years	10.3	112	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	27.6	103	
2.2	Tertiary education	22.5	96	
2.2.1	Tertiary enrolment, % gross	4.1	127	
2.2.2	Graduates in science & engineering, %	20.5	53	
2.2.3	Tertiary inbound mobility, %	1.7	72	
2.3	Research & development (R&D)	0.9	116	
2.3.1	Researchers, FTE/mn pop.◴	51.0	88	
2.3.2	Gross expenditure on R&D, % GDP◴	0.1	106	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**17.3**	**137**	○
3.1	Information & communication technologies (ICTs)	19.4	124	
3.1.1	ICT access*	16.8	137	○
3.1.2	ICT use*	0.9	134	○
3.1.3	Government's online service*	24.4	113	
3.1.4	E-participation*	35.3	88	
3.2	General infrastructure	14.5	133	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	11.3	118	
3.2.3	Gross capital formation, % GDP	15.6	121	
3.3	Ecological sustainability	18.0	138	○
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	26.7	134	○
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	130	
4	**Market sophistication**	**41.8**	**103**	
4.1	Credit	6.6	137	○
4.1.1	Ease of getting credit*	5.0	138	○
4.1.2	Domestic credit to private sector, % GDP	11.9	134	○
4.1.3	Microfinance gross loans, % GDP	1.0	38	●
4.2	Investment	53.3	20	
4.2.1	Ease of protecting investors*	53.3	79	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	65.6	115	
4.3.1	Applied tariff rate, weighted mean, %	9.1	116	
4.3.2	Intensity of local competition†	63.3	87	
5	**Business sophistication**	**26.9**	**113**	
5.1	Knowledge workers	8.2	137	○
5.1.1	Knowledge-intensive employment, %◴	3.5	114	○
5.1.2	Firms offering formal training, % firms	12.7	103	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total◴	2.3	82	
5.2	Innovation linkages	25.3	99	
5.2.1	University/industry research collaboration†	37.6	90	
5.2.2	State of cluster development†	31.1	127	○
5.2.3	GERD financed by abroad, %◴	10.6	41	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	47.2	19	●
5.3.1	Royalty & license fees payments, % total trade◴	0.7	46	●
5.3.2	High-tech imports less re-imports, % total trade	4.2	110	
5.3.3	Comm., computer & info. services imp., % total trade◴	3.0	5	●
5.3.4	FDI net inflows, % GDP	7.8	16	●
6	**Knowledge & technology outputs**	**14.2**	**124**	
6.1	Knowledge creation	3.8	116	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.1	96	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	72	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	5.7	92	
6.1.5	Citable documents H index	62.0	102	
6.2	Knowledge impact	20.0	122	
6.2.1	Growth rate of PPP$ GDP/worker, %	-0.6	107	
6.2.2	New businesses/th pop. 15–64	0.1	103	○
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.4	106	
6.2.5	High- & medium-high-tech manufactures, %◴	2.4	94	
6.3	Knowledge diffusion	19.0	113	
6.3.1	Royalty & license fees receipts, % total trade◴	0.2	31	●
6.3.2	High-tech exports less re-exports, % total trade	0.1	116	
6.3.3	Comm., computer & info. services exp., % total trade◴	1.7	53	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**22.1**	**113**	
7.1	Intangible assets	35.1	116	
7.1.1	Domestic res trademark app./bn PPP$ GDP	51.5	45	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.1	59	
7.1.3	ICTs & business model creation†	47.3	101	
7.1.4	ICTs & organizational model creation†	47.0	95	
7.2	Creative goods & services	18.0	74	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	2.1	27	●
7.2.5	Creative goods exports, % total trade◴	0.1	90	
7.3	Online creativity	0.1	135	○
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.2	129	
7.3.2	Country-code TLDs/th pop. 15–69	0.1	126	
7.3.3	Wikipedia edits/pop. 15–69	16.1	134	○
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Malawi

Key indicators

Population (millions)	16.8
GDP (US$ billions)	4.3
GDP per capita, PPP$	920.0
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**29.7**	**98**	
Innovation Output Sub-Index		25.4	89	
Innovation Input Sub-Index		34.0	111	
Innovation Efficiency Ratio		0.7	53	●
Global Innovation Index 2014 (out of 143)		27.6	113	
1	**Institutions**	**51.6**	**103**	
1.1	Political environment	42.4	90	
1.1.1	Political stability*	58.6	80	
1.1.2	Government effectiveness*	26.2	104	
1.2	Regulatory environment	59.5	86	
1.2.1	Regulatory quality*	29.7	115	
1.2.2	Rule of law*	42.6	69	
1.2.3	Cost of redundancy dismissal, salary weeks	16.6	74	
1.3	Business environment	53.0	125	
1.3.1	Ease of starting a business*	68.5	124	
1.3.2	Ease of resolving insolvency*	19.0	138	○
1.3.3	Ease of paying taxes*	71.4	81	
2	**Human capital & research**	**11.5**	**136**	○
2.1	Education	31.9	109	
2.1.1	Expenditure on education, % GDP	5.4	43	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	33.2	15	●
2.1.3	School life expectancy, years◴	10.8	109	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	41.7	120	○
2.2	Tertiary education	2.4	137	○
2.2.1	Tertiary enrolment, % gross◴	0.8	134	○
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %◴	1.1	81	
2.3	Research & development (R&D)	0.3	124	
2.3.1	Researchers, FTE/mn pop.◴	48.8	90	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**23.9**	**118**	
3.1	Information & communication technologies (ICTs)	15.7	134	○
3.1.1	ICT access*	18.9	134	○
3.1.2	ICT use*	3.1	126	○
3.1.3	Government's online service*	17.3	122	
3.1.4	E-participation*	23.5	115	
3.2	General infrastructure	28.0	81	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	33.3	70	
3.2.3	Gross capital formation, % GDP	19.9	86	
3.3	Ecological sustainability	27.9	107	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	40.1	107	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.5	85	
4	**Market sophistication**	**39.2**	**114**	
4.1	Credit	20.8	111	
4.1.1	Ease of getting credit*	25.0	125	○
4.1.2	Domestic credit to private sector, % GDP	18.5	116	
4.1.3	Microfinance gross loans, % GDP	2.7	20	●
4.2	Investment	25.3	122	
4.2.1	Ease of protecting investors*	45.0	114	
4.2.2	Market capitalization, % GDP	17.8	76	
4.2.3	Total value of stocks traded, % GDP	0.4	83	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	71.7	90	
4.3.1	Applied tariff rate, weighted mean, %	6.4	94	
4.3.2	Intensity of local competition†	65.8	73	
5	**Business sophistication**	**43.7**	**32**	
5.1	Knowledge workers	59.4	25	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	48.4	31	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	40.1	43	
5.2.1	University/industry research collaboration†	30.7	116	
5.2.2	State of cluster development†	44.8	76	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	31.6	80	
5.3.1	Royalty & license fees payments, % total trade◴	0.0	116	○
5.3.2	High-tech imports less re-imports, % total trade	13.3	20	●
5.3.3	Comm., computer & info. services imp., % total trade◴	0.4	109	
5.3.4	FDI net inflows, % GDP	3.2	59	●
6	**Knowledge & technology outputs**	**26.7**	**66**	
6.1	Knowledge creation	23.9	41	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	26.2	30	●
6.1.5	Citable documents H index	89.0	81	
6.2	Knowledge impact	28.5	112	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.7	52	●
6.2.2	New businesses/th pop. 15–64◴	0.1	102	○
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.7	98	
6.2.5	High- & medium-high-tech manufactures, %◴	8.6	82	
6.3	Knowledge diffusion	27.7	68	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	1.0	64	
6.3.3	Comm., computer & info. services exp., % total trade◴	1.2	73	
6.3.4	FDI net outflows, % GDP◴	1.2	48	●
7	**Creative outputs**	**24.1**	**104**	
7.1	Intangible assets	42.1	88	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	42.6	118	
7.1.4	ICTs & organizational model creation†	41.6	111	
7.2	Creative goods & services	12.3	89	
7.2.1	Cultural & creative services exports, % total trade	0.0	67	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	1.7	35	●
7.2.5	Creative goods exports, % total trade◴	0.1	93	
7.3	Online creativity	0.1	132	○
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.2	124	
7.3.2	Country-code TLDs/th pop. 15–69	0.1	120	
7.3.3	Wikipedia edits/pop. 15–69	14.2	135	○
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Malaysia

Key indicators

Population (millions)	30.2
GDP (US$ billions)	326.9
GDP per capita, PPP$	18,639.2
Income group	Upper-middle income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**46.0**	**32**	
Innovation Output Sub-Index		39.2	34	
Innovation Input Sub-Index		52.8	31	
Innovation Efficiency Ratio		0.7	56	
Global Innovation Index 2014 (out of 143)		45.6	33	
1	**Institutions**	**71.7**	**42**	
1.1	Political environment	68.3	42	
1.1.1	Political stability*	65.4	63	
1.1.2	Government effectiveness*	71.1	31	
1.2	Regulatory environment	65.4	74	
1.2.1	Regulatory quality*	64.2	43	
1.2.2	Rule of law*	60.3	45	
1.2.3	Cost of redundancy dismissal, salary weeks	23.9	108	○
1.3	Business environment	81.5	22	
1.3.1	Ease of starting a business*	94.9	13	
1.3.2	Ease of resolving insolvency*	65.6	34	
1.3.3	Ease of paying taxes*	84.0	29	
2	**Human capital & research**	**39.9**	**37**	
2.1	Education	42.3	77	
2.1.1	Expenditure on education, % GDP	5.9	31	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	19.9	57	
2.1.3	School life expectancy, years◴	12.7	82	
2.1.4	PISA scales in reading, maths, & science	412.7	51	○
2.1.5	Pupil-teacher ratio, secondary	13.9	53	
2.2	Tertiary education	45.1	29	
2.2.1	Tertiary enrolment, % gross	37.2	69	
2.2.2	Graduates in science & engineering, %	30.9	9	●
2.2.3	Tertiary inbound mobility, %	5.2	34	
2.3	Research & development (R&D)	32.4	31	
2.3.1	Researchers, FTE/mn pop.◴	1777.2	37	
2.3.2	Gross expenditure on R&D, % GDP◴	1.1	32	
2.3.3	QS university ranking, average score top 3*	49.4	27	
3	**Infrastructure**	**46.7**	**44**	
3.1	Information & communication technologies (ICTs)	54.5	49	
3.1.1	ICT access*	65.8	54	
3.1.2	ICT use*	31.6	65	
3.1.3	Government's online service*	67.7	31	
3.1.4	E-participation*	52.9	59	
3.2	General infrastructure	44.3	30	
3.2.1	Electricity output, kWh/cap	4595.8	46	
3.2.2	Logistics performance*	72.9	24	
3.2.3	Gross capital formation, % GDP	26.7	39	
3.3	Ecological sustainability	41.2	52	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.0	65	
3.3.2	Environmental performance*	59.3	48	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	3.2	30	
4	**Market sophistication**	**58.0**	**27**	
4.1	Credit	37.3	48	
4.1.1	Ease of getting credit*	70.0	22	
4.1.2	Domestic credit to private sector, % GDP	124.0	22	
4.1.3	Microfinance gross loans, % GDP◴	0.1	65	○
4.2	Investment	56.2	16	
4.2.1	Ease of protecting investors*	74.2	5	●
4.2.2	Market capitalization, % GDP	156.0	4	●
4.2.3	Total value of stocks traded, % GDP	40.8	20	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	46	
4.3	Trade & competition	80.6	51	
4.3.1	Applied tariff rate, weighted mean, %◴	4.0	63	
4.3.2	Intensity of local competition†	74.9	32	
5	**Business sophistication**	**47.6**	**22**	
5.1	Knowledge workers	48.1	38	
5.1.1	Knowledge-intensive employment, %	24.7	57	
5.1.2	Firms offering formal training, % firms◴	50.1	28	
5.1.3	GERD performed by business, % of GDP◴	0.7	26	
5.1.4	GERD financed by business, %◴	60.2	11	
5.1.5	Females employed w/advanced degrees, % total	10.5	60	○
5.2	Innovation linkages	38.7	46	
5.2.1	University/industry research collaboration†	72.1	12	●
5.2.2	State of cluster development†	71.3	8	●
5.2.3	GERD financed by abroad, %◴	4.6	66	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	23	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	56	
5.3	Knowledge absorption	55.8	6	●
5.3.1	Royalty & license fees payments, % total trade	0.6	51	
5.3.2	High-tech imports less re-imports, % total trade	23.4	1	●
5.3.3	Comm., computer & info. services imp., % total trade	1.3	43	
5.3.4	FDI net inflows, % GDP	3.7	43	
6	**Knowledge & technology outputs**	**36.2**	**35**	
6.1	Knowledge creation	9.3	76	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.7	49	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.4	42	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.1	53	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	13.9	54	
6.1.5	Citable documents H index	145.0	51	
6.2	Knowledge impact	48.0	27	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.0	29	
6.2.2	New businesses/th pop. 15–64	2.3	44	
6.2.3	Computer software spending, % GDP	0.4	20	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	17.3	22	
6.2.5	High- & medium-high-tech manufactures, %◴	42.0	19	
6.3	Knowledge diffusion	51.3	12	●
6.3.1	Royalty & license fees receipts, % total trade	0.0	74	○
6.3.2	High-tech exports less re-exports, % total trade	27.8	1	●
6.3.3	Comm., computer & info. services exp., % total trade	1.2	75	
6.3.4	FDI net outflows, % GDP	4.2	12	
7	**Creative outputs**	**42.1**	**32**	
7.1	Intangible assets	53.5	32	
7.1.1	Domestic res trademark app./bn PPP$ GDP	21.2	80	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	75.0	10	●
7.1.4	ICTs & organizational model creation†	74.9	4	●
7.2	Creative goods & services	37.7	22	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	3.4	47	
7.2.3	Global ent. & media output/th pop. 15–69	10.7	32	
7.2.4	Printing & publishing output manufactures, %◴	0.9	78	○
7.2.5	Creative goods exports, % total trade	10.3	3	●
7.3	Online creativity	23.7	57	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	7.6	49	
7.3.2	Country-code TLDs/th pop. 15–69	5.3	52	
7.3.3	Wikipedia edits/pop. 15–69	1677.1	60	
7.3.4	Video uploads on YouTube/pop. 15–69	69.6	56	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Mali

Key indicators

Population (millions)	15.8
GDP (US$ billions)	11.9
GDP per capita, PPP$	1,156.6
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**28.4**	**105**	
Innovation Output Sub-Index		26.4	81	
Innovation Input Sub-Index		30.4	125	
Innovation Efficiency Ratio		0.9	14	●
Global Innovation Index 2014 (out of 143)		26.2	119	
1	**Institutions**	**45.0**	**122**	
1.1	Political environment	20.6	135	
1.1.1	Political stability*	22.5	136	○
1.1.2	Government effectiveness*	18.7	120	
1.2	Regulatory environment	60.0	85	
1.2.1	Regulatory quality*	34.4	108	
1.2.2	Rule of law*	27.7	109	
1.2.3	Cost of redundancy dismissal, salary weeks	13.6	57	●
1.3	Business environment	54.5	119	
1.3.1	Ease of starting a business*	62.9	133	
1.3.2	Ease of resolving insolvency*	40.4	100	
1.3.3	Ease of paying taxes*	60.2	111	
2	**Human capital & research**	**14.7**	**124**	
2.1	Education	34.9	101	
2.1.1	Expenditure on education, % GDP	4.8	65	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	31.2	21	●
2.1.3	School life expectancy, years◴	8.4	126	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	19.3	81	
2.2	Tertiary education	4.0	134	○
2.2.1	Tertiary enrolment, % gross	7.5	120	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %◴	0.5	94	
2.3	Research & development (R&D)	5.3	81	
2.3.1	Researchers, FTE/mn pop.◴	31.6	101	
2.3.2	Gross expenditure on R&D, % GDP◴	0.7	53	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**19.9**	**130**	
3.1	Information & communication technologies (ICTs)	16.5	129	
3.1.1	ICT access*	35.5	107	
3.1.2	ICT use*	1.4	133	○
3.1.3	Government's online service*	13.4	131	
3.1.4	E-participation*	15.7	126	
3.2	General infrastructure	30.9	68	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	17.0	109	
3.2.3	Gross capital formation, % GDP	25.6	41	●
3.3	Ecological sustainability	12.4	141	○
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	18.4	139	○
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.0	134	○
4	**Market sophistication**	**41.2**	**106**	
4.1	Credit	14.8	124	
4.1.1	Ease of getting credit*	30.0	113	
4.1.2	Domestic credit to private sector, % GDP	22.8	113	
4.1.3	Microfinance gross loans, % GDP	0.7	41	
4.2	Investment	42.5	45	●
4.2.1	Ease of protecting investors*	42.5	120	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	66.1	110	
4.3.1	Applied tariff rate, weighted mean, %	8.4	111	
4.3.2	Intensity of local competition†	61.7	94	
5	**Business sophistication**	**31.1**	**87**	
5.1	Knowledge workers	22.3	114	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	32.1	57	
5.1.3	GERD performed by business, % of GDP◴	0.0	81	
5.1.4	GERD financed by business, %◴	10.1	70	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	30.8	74	
5.2.1	University/industry research collaboration†	36.7	97	
5.2.2	State of cluster development†	49.2	53	●
5.2.3	GERD financed by abroad, %◴	8.8	47	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	33	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	40.2	41	●
5.3.1	Royalty & license fees payments, % total trade◴	0.1	108	
5.3.2	High-tech imports less re-imports, % total trade	5.1	97	
5.3.3	Comm., computer & info. services imp., % total trade◴	2.6	7	●
5.3.4	FDI net inflows, % GDP	3.7	41	●
6	**Knowledge & technology outputs**	**24.8**	**77**	
6.1	Knowledge creation	6.0	95	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	4.9	98	
6.1.5	Citable documents H index	59.0	107	
6.2	Knowledge impact	42.6	46	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.8	49	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.2	139	○
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	25.8	82	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	93	
6.3.2	High-tech exports less re-exports, % total trade	0.1	107	
6.3.3	Comm., computer & info. services exp., % total trade◴	3.3	17	●
6.3.4	FDI net outflows, % GDP◴	0.0	96	
7	**Creative outputs**	**28.0**	**87**	
7.1	Intangible assets	55.7	24	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	59.1	55	●
7.1.4	ICTs & organizational model creation†	52.4	67	
7.2	Creative goods & services	0.3	136	○
7.2.1	Cultural & creative services exports, % total trade	0.0	80	
7.2.2	National feature films/mn pop. 15–69◴	0.1	103	○
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade◴	0.0	127	○
7.3	Online creativity	0.1	136	○
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.2	127	
7.3.2	Country-code TLDs/th pop. 15–69	0.0	140	○
7.3.3	Wikipedia edits/pop. 15–69	12.7	137	○
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Malta

Key indicators

Population (millions)	0.4
GDP (US$ billions)	10.6
GDP per capita, PPP$	28,741.0
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**50.5**	**26**	
Innovation Output Sub-Index		49.2	13	
Innovation Input Sub-Index		51.8	33	
Innovation Efficiency Ratio		0.9	7	●
Global Innovation Index 2014 (out of 143)		50.4	25	
1	**Institutions**	**80.6**	**24**	
1.1	Political environment	82.1	21	
1.1.1	Political stability*	89.0	18	
1.1.2	Government effectiveness*	75.1	24	
1.2	Regulatory environment	91.2	15	
1.2.1	Regulatory quality*	82.1	20	
1.2.2	Rule of law*	82.8	23	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	68.6	73	
1.3.1	Ease of starting a business*	75.3	110	○
1.3.2	Ease of resolving insolvency*	44.8	81	
1.3.3	Ease of paying taxes*	85.8	25	
2	**Human capital & research**	**39.3**	**40**	
2.1	Education	70.4	4	●
2.1.1	Expenditure on education, % GDP	8.0	7	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	66.4	2	●
2.1.3	School life expectancy, years	14.4	50	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	8.5	12	
2.2	Tertiary education	32.3	68	
2.2.1	Tertiary enrolment, % gross	41.2	63	
2.2.2	Graduates in science & engineering, %	19.1	59	
2.2.3	Tertiary inbound mobility, %	4.8	35	
2.3	Research & development (R&D)	15.1	55	
2.3.1	Researchers, FTE/mn pop.	2039.6	34	
2.3.2	Gross expenditure on R&D, % GDP	0.9	38	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**48.0**	**41**	
3.1	Information & communication technologies (ICTs)	58.0	44	
3.1.1	ICT access*	89.8	7	●
3.1.2	ICT use*	54.8	31	
3.1.3	Government's online service*	40.2	80	
3.1.4	E-participation*	47.1	70	
3.2	General infrastructure	28.6	77	
3.2.1	Electricity output, kWh/cap	5452.4	37	
3.2.2	Logistics performance*	48.2	49	
3.2.3	Gross capital formation, % GDP	16.9	117	○
3.3	Ecological sustainability	57.4	8	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	14.5	3	●
3.3.2	Environmental performance*	67.4	34	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.6	40	
4	**Market sophistication**	**50.3**	**54**	
4.1	Credit	24.4	91	○
4.1.1	Ease of getting credit*	10.0	133	○
4.1.2	Domestic credit to private sector, % GDP	119.3	24	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	36.0	65	
4.2.1	Ease of protecting investors*	59.2	49	
4.2.2	Market capitalization, % GDP	41.0	49	
4.2.3	Total value of stocks traded, % GDP	0.5	79	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	90.7	4	●
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	84.8	2	●
5	**Business sophistication**	**40.8**	**38**	
5.1	Knowledge workers	49.0	37	
5.1.1	Knowledge-intensive employment, %	40.6	22	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	0.5	33	
5.1.4	GERD financed by business, %	44.3	29	
5.1.5	Females employed w/advanced degrees, % total	12.2	53	○
5.2	Innovation linkages	41.7	33	
5.2.1	University/industry research collaboration†	47.6	49	
5.2.2	State of cluster development†	50.7	46	
5.2.3	GERD financed by abroad, %	20.2	22	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.7	21	
5.3	Knowledge absorption	31.8	77	
5.3.1	Royalty & license fees payments, % total trade	1.5	16	
5.3.2	High-tech imports less re-imports, % total trade	13.4	19	
5.3.3	Comm., computer & info. services imp., % total trade	1.2	47	
5.3.4	FDI net inflows, % GDP	-19.4	140	○
6	**Knowledge & technology outputs**	**38.5**	**29**	
6.1	Knowledge creation	22.3	43	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.0	62	
6.1.2	PCT resident patent app./bn PPP$ GDP	4.1	12	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	17.1	45	
6.1.5	Citable documents H index	70.0	96	○
6.2	Knowledge impact	51.8	16	
6.2.1	Growth rate of PPP$ GDP/worker, %	-0.3	104	○
6.2.2	New businesses/th pop. 15–64	13.6	6	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	34.3	6	●
6.2.5	High- & medium-high-tech manufactures, % ④	0.3	100	○
6.3	Knowledge diffusion	41.5	32	
6.3.1	Royalty & license fees receipts, % total trade	0.2	35	
6.3.2	High-tech exports less re-exports, % total trade	11.8	18	
6.3.3	Comm., computer & info. services exp., % total trade	1.3	70	
6.3.4	FDI net outflows, % GDP	2.8	22	
7	**Creative outputs**	**59.8**	**6**	●
7.1	Intangible assets	66.3	5	●
7.1.1	Domestic res trademark app./bn PPP$ GDP	132.5	4	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	64.2	35	
7.1.4	ICTs & organizational model creation†	60.2	39	
7.2	Creative goods & services	47.3	5	●
7.2.1	Cultural & creative services exports, % total trade	0.2	50	
7.2.2	National feature films/mn pop. 15–69	6.2	31	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, % ④	36.2	1	●
7.2.5	Creative goods exports, % total trade	0.9	40	
7.3	Online creativity	59.3	18	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	100.0	1	●
7.3.2	Country-code TLDs/th pop. 15–69	8.2	45	
7.3.3	Wikipedia edits/pop. 15–69	9424.4	5	●
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
④ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Mauritius

Key indicators

Population (millions)	1.2
GDP (US$ billions)	13.2
GDP per capita, PPP$	16,820.3
Income group	Upper-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**39.2**	**49**	
Innovation Output Sub-Index		31.0	60	
Innovation Input Sub-Index		47.5	44	
Innovation Efficiency Ratio		0.7	96	
Global Innovation Index 2014 (out of 143)		40.9	40	
1	**Institutions**	**80.7**	**23**	
1.1	Political environment	76.2	31	
1.1.1	Political stability*	87.3	22	●
1.1.2	Government effectiveness*	65.1	36	
1.2	Regulatory environment	83.5	23	
1.2.1	Regulatory quality*	72.8	31	
1.2.2	Rule of law*	71.6	34	
1.2.3	Cost of redundancy dismissal, salary weeks	10.6	39	
1.3	Business environment	82.4	20	●
1.3.1	Ease of starting a business*	92.5	26	
1.3.2	Ease of resolving insolvency*	62.8	41	
1.3.3	Ease of paying taxes*	91.9	13	●
2	**Human capital & research**	**23.1**	**95**	
2.1	Education	43.8	72	
2.1.1	Expenditure on education, % GDP	3.7	96	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	19.0	61	
2.1.3	School life expectancy, years	15.6	31	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	14.7	62	
2.2	Tertiary education	23.5	92	
2.2.1	Tertiary enrolment, % gross	41.2	64	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	2.9	55	
2.3	Research & development (R&D)	2.1	101	
2.3.1	Researchers, FTE/mn pop.◴	183.9	68	
2.3.2	Gross expenditure on R&D, % GDP◴	0.2	91	○
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**40.5**	**66**	
3.1	Information & communication technologies (ICTs)	48.3	66	
3.1.1	ICT access*	63.2	61	
3.1.2	ICT use*	29.7	72	
3.1.3	Government's online service*	47.2	68	
3.1.4	E-participation*	52.9	59	
3.2	General infrastructure	23.6	106	
3.2.1	Electricity output, kWh/cap	2168.2	74	
3.2.2	Logistics performance*	18.0	106	○
3.2.3	Gross capital formation, % GDP	23.2	55	
3.3	Ecological sustainability	49.5	30	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	13.9	6	●
3.3.2	Environmental performance*	58.1	53	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.6	74	
4	**Market sophistication**	**63.7**	**15**	●
4.1	Credit	50.0	22	●
4.1.1	Ease of getting credit*	65.0	34	
4.1.2	Domestic credit to private sector, % GDP	108.1	28	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	54.0	19	●
4.2.1	Ease of protecting investors*	65.0	28	
4.2.2	Market capitalization, % GDP	62.0	29	
4.2.3	Total value of stocks traded, % GDP	2.6	57	
4.2.4	Venture capital deals/tr PPP$ GDP	0.8	1	●
4.3	Trade & competition	87.0	15	●
4.3.1	Applied tariff rate, weighted mean, %	0.8	5	●
4.3.2	Intensity of local competition†	76.7	22	
5	**Business sophistication**	**29.5**	**98**	
5.1	Knowledge workers	24.6	106	
5.1.1	Knowledge-intensive employment, %◴	20.4	71	
5.1.2	Firms offering formal training, % firms◴	25.6	74	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %◴	0.3	88	○
5.1.5	Females employed w/advanced degrees, % total◴	7.4	72	○
5.2	Innovation linkages	35.8	57	
5.2.1	University/industry research collaboration†	36.5	98	
5.2.2	State of cluster development†	54.8	33	
5.2.3	GERD financed by abroad, %◴	6.4	59	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	8	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.2	35	
5.3	Knowledge absorption	28.0	100	
5.3.1	Royalty & license fees payments, % total trade	0.2	87	
5.3.2	High-tech imports less re-imports, % total trade	5.1	98	
5.3.3	Comm., computer & info. services imp., % total trade	1.2	50	
5.3.4	FDI net inflows, % GDP	2.2	77	
6	**Knowledge & technology outputs**	**27.2**	**62**	
6.1	Knowledge creation	3.5	123	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.1	102	○
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	4.5	103	
6.1.5	Citable documents H index	45.0	120	○
6.2	Knowledge impact	27.6	113	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	7.4	17	●
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	10.0	41	
6.2.5	High- & medium-high-tech manufactures, %	9.2	80	○
6.3	Knowledge diffusion	50.5	13	●
6.3.1	Royalty & license fees receipts, % total trade	0.0	71	
6.3.2	High-tech exports less re-exports, % total trade	0.1	113	○
6.3.3	Comm., computer & info. services exp., % total trade	2.6	27	
6.3.4	FDI net outflows, % GDP	210.2	1	●
7	**Creative outputs**	**34.8**	**57**	
7.1	Intangible assets	44.8	72	
7.1.1	Domestic res trademark app./bn PPP$ GDP	35.3	66	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	58.9	57	
7.1.4	ICTs & organizational model creation†	56.9	53	
7.2	Creative goods & services	41.0	13	●
7.2.1	Cultural & creative services exports, % total trade	0.0	74	○
7.2.2	National feature films/mn pop. 15–69◴	32.6	1	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	3.2	10	●
7.2.5	Creative goods exports, % total trade	0.8	44	
7.3	Online creativity	8.5	82	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	14.9	35	
7.3.2	Country-code TLDs/th pop. 15–69	3.4	62	
7.3.3	Wikipedia edits/pop. 15–69	998.8	74	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Mexico

Key indicators

Population (millions)	123.8
GDP (US$ billions)	1,282.7
GDP per capita, PPP$	16,111.5
Income group	Upper-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**38.0**	**57**	
Innovation Output Sub-Index		32.2	54	
Innovation Input Sub-Index		43.9	58	
Innovation Efficiency Ratio		0.7	61	
Global Innovation Index 2014 (out of 143)		36.0	66	
1	**Institutions**	**61.5**	**66**	
1.1	Political environment	47.8	76	
1.1.1	Political stability*	45.9	107	○
1.1.2	Government effectiveness*	49.7	54	
1.2	Regulatory environment	59.2	88	
1.2.1	Regulatory quality*	60.0	51	
1.2.2	Rule of law*	32.3	96	
1.2.3	Cost of redundancy dismissal, salary weeks	22.0	103	
1.3	Business environment	77.5	34	
1.3.1	Ease of starting a business*	88.9	57	
1.3.2	Ease of resolving insolvency*	72.6	25	●
1.3.3	Ease of paying taxes*	71.2	83	
2	**Human capital & research**	**34.3**	**52**	
2.1	Education	38.9	87	
2.1.1	Expenditure on education, % GDP	5.1	50	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	15.9	78	
2.1.3	School life expectancy, years	13.1	80	
2.1.4	PISA scales in reading, maths, & science	417.3	47	○
2.1.5	Pupil-teacher ratio, secondary	17.7	77	
2.2	Tertiary education	44.4	34	
2.2.1	Tertiary enrolment, % gross	29.0	77	
2.2.2	Graduates in science & engineering, %	26.9	18	●
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	19.8	47	
2.3.1	Researchers, FTE/mn pop.◴	386.4	63	
2.3.2	Gross expenditure on R&D, % GDP	0.5	62	
2.3.3	QS university ranking, average score top 3*	43.2	33	●
3	**Infrastructure**	**39.5**	**69**	
3.1	Information & communication technologies (ICTs)	49.9	59	
3.1.1	ICT access*	48.0	81	
3.1.2	ICT use*	24.5	85	
3.1.3	Government's online service*	66.1	35	
3.1.4	E-participation*	60.8	45	
3.2	General infrastructure	30.4	70	
3.2.1	Electricity output, kWh/cap	2518.7	69	
3.2.2	Logistics performance*	49.3	48	
3.2.3	Gross capital formation, % GDP	21.9	69	
3.3	Ecological sustainability	38.4	66	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	8.7	44	
3.3.2	Environmental performance*	55.0	59	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.5	79	
4	**Market sophistication**	**47.0**	**69**	
4.1	Credit	30.0	75	
4.1.1	Ease of getting credit*	80.0	11	●
4.1.2	Domestic credit to private sector, % GDP	30.6	99	
4.1.3	Microfinance gross loans, % GDP	0.1	66	
4.2	Investment	30.2	96	
4.2.1	Ease of protecting investors*	57.5	60	
4.2.2	Market capitalization, % GDP	44.3	45	
4.2.3	Total value of stocks traded, % GDP	10.0	39	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	62	○
4.3	Trade & competition	80.7	50	
4.3.1	Applied tariff rate, weighted mean, %◴	2.2	47	
4.3.2	Intensity of local competition†	68.9	62	
5	**Business sophistication**	**36.9**	**56**	
5.1	Knowledge workers	37.1	72	
5.1.1	Knowledge-intensive employment, %	19.1	77	
5.1.2	Firms offering formal training, % firms◴	50.8	27	
5.1.3	GERD performed by business, % of GDP	0.2	51	
5.1.4	GERD financed by business, %	31.7	46	
5.1.5	Females employed w/advanced degrees, % total	8.2	68	○
5.2	Innovation linkages	23.4	108	○
5.2.1	University/industry research collaboration†	49.5	42	
5.2.2	State of cluster development†	52.5	42	
5.2.3	GERD financed by abroad, %	0.7	93	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	82	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	66	
5.3	Knowledge absorption	50.4	13	●
5.3.1	Royalty & license fees payments, % total trade	0.4	65	
5.3.2	High-tech imports less re-imports, % total trade	17.7	9	●
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	3.0	64	
6	**Knowledge & technology outputs**	**29.4**	**50**	
6.1	Knowledge creation	8.4	83	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.6	73	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	58	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.3	43	
6.1.4	Scientific & technical articles/bn PPP$ GDP	5.5	95	
6.1.5	Citable documents H index	261.0	33	●
6.2	Knowledge impact	32.4	96	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.3	92	○
6.2.2	New businesses/th pop. 15–64	0.9	73	
6.2.3	Computer software spending, % GDP	0.2	70	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	2.6	87	
6.2.5	High- & medium-high-tech manufactures, %	43.7	12	●
6.3	Knowledge diffusion	47.5	22	●
6.3.1	Royalty & license fees receipts, % total trade	0.6	23	●
6.3.2	High-tech exports less re-exports, % total trade	14.4	10	●
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	1.0	53	
7	**Creative outputs**	**35.0**	**56**	
7.1	Intangible assets	43.9	78	
7.1.1	Domestic res trademark app./bn PPP$ GDP	37.4	65	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	56.9	65	
7.1.4	ICTs & organizational model creation†	54.7	61	
7.2	Creative goods & services	29.3	38	
7.2.1	Cultural & creative services exports, % total trade	0.0	70	○
7.2.2	National feature films/mn pop. 15–69	1.5	66	
7.2.3	Global ent. & media output/th pop. 15–69	8.0	39	
7.2.4	Printing & publishing output manufactures, %	0.6	88	○
7.2.5	Creative goods exports, % total trade	9.8	5	●
7.3	Online creativity	22.8	60	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.1	71	
7.3.2	Country-code TLDs/th pop. 15–69	3.6	60	
7.3.3	Wikipedia edits/pop. 15–69	1479.0	65	
7.3.4	Video uploads on YouTube/pop. 15–69	73.7	48	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Moldova, Republic of

Key indicators

Population (millions)	3.5
GDP (US$ billions)	7.9
GDP per capita, PPP$	3,926.9
Income group	Lower-middle income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**40.5**	**44**	
Innovation Output Sub-Index		40.1	31	
Innovation Input Sub-Index		41.0	74	
Innovation Efficiency Ratio		1.0	5	●
Global Innovation Index 2014 (out of 143)		40.7	43	
1	**Institutions**	**59.0**	**75**	
1.1	Political environment	47.0	78	
1.1.1	Political stability*	63.3	68	
1.1.2	Government effectiveness*	30.6	92	
1.2	Regulatory environment	56.1	98	
1.2.1	Regulatory quality*	45.5	79	
1.2.2	Rule of law*	36.7	84	
1.2.3	Cost of redundancy dismissal, salary weeks	22.6	104	
1.3	Business environment	74.0	53	
1.3.1	Ease of starting a business*	92.2	30	
1.3.2	Ease of resolving insolvency*	53.3	56	
1.3.3	Ease of paying taxes*	76.6	57	
2	**Human capital & research**	**27.6**	**74**	
2.1	Education	55.8	26	●
2.1.1	Expenditure on education, % GDP	8.3	5	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	37.8	9	●
2.1.3	School life expectancy, years	11.9	94	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	9.6	24	●
2.2	Tertiary education	21.5	100	
2.2.1	Tertiary enrolment, % gross	41.3	62	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	1.9	67	
2.3	Research & development (R&D)	5.7	78	
2.3.1	Researchers, FTE/mn pop.	752.2	53	
2.3.2	Gross expenditure on R&D, % GDP	0.4	73	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**36.0**	**82**	
3.1	Information & communication technologies (ICTs)	55.1	48	
3.1.1	ICT access*	65.6	55	
3.1.2	ICT use*	39.4	57	
3.1.3	Government's online service*	52.8	60	
3.1.4	E-participation*	62.7	40	
3.2	General infrastructure	24.1	104	
3.2.1	Electricity output, kWh/cap	1629.8	83	
3.2.2	Logistics performance*	25.1	89	
3.2.3	Gross capital formation, % GDP	22.7	57	
3.3	Ecological sustainability	28.9	98	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.0	108	○
3.3.2	Environmental performance*	53.4	66	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.5	84	
4	**Market sophistication**	**50.6**	**52**	
4.1	Credit	36.6	51	
4.1.1	Ease of getting credit*	70.0	22	
4.1.2	Domestic credit to private sector, % GDP	39.7	85	
4.1.3	Microfinance gross loans, % GDP	2.3	23	
4.2	Investment	38.9	56	
4.2.1	Ease of protecting investors*	58.3	54	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP◴	0.2	88	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	76.2	72	
4.3.1	Applied tariff rate, weighted mean, %	2.6	53	
4.3.2	Intensity of local competition†	61.4	95	
5	**Business sophistication**	**31.7**	**83**	
5.1	Knowledge workers	36.8	74	
5.1.1	Knowledge-intensive employment, %	30.0	47	
5.1.2	Firms offering formal training, % firms	32.8	56	
5.1.3	GERD performed by business, % of GDP	0.1	66	○
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	13.9	42	
5.2	Innovation linkages	20.9	121	○
5.2.1	University/industry research collaboration†	29.0	120	○
5.2.2	State of cluster development†	23.2	133	○
5.2.3	GERD financed by abroad, %	11.8	39	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.1	37	
5.3	Knowledge absorption	37.4	52	
5.3.1	Royalty & license fees payments, % total trade	0.5	56	
5.3.2	High-tech imports less re-imports, % total trade	7.0	65	
5.3.3	Comm., computer & info. services imp., % total trade	1.8	21	●
5.3.4	FDI net inflows, % GDP	3.2	61	
6	**Knowledge & technology outputs**	**39.6**	**26**	●
6.1	Knowledge creation	43.2	20	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	4.0	25	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.2	52	
6.1.3	Domestic res utility model app./bn PPP$ GDP	12.6	1	●
6.1.4	Scientific & technical articles/bn PPP$ GDP	13.8	55	
6.1.5	Citable documents H index	68.0	97	
6.2	Knowledge impact	42.6	45	
6.2.1	Growth rate of PPP$ GDP/worker, %	5.3	4	●
6.2.2	New businesses/th pop. 15–64◴	1.6	53	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	7.2	48	
6.2.5	High- & medium-high-tech manufactures, %	8.3	83	○
6.3	Knowledge diffusion	33.0	47	
6.3.1	Royalty & license fees receipts, % total trade	0.1	50	
6.3.2	High-tech exports less re-exports, % total trade	0.3	85	
6.3.3	Comm., computer & info. services exp., % total trade	4.1	11	●
6.3.4	FDI net outflows, % GDP	0.5	66	
7	**Creative outputs**	**40.5**	**38**	
7.1	Intangible assets	68.1	3	●
7.1.1	Domestic res trademark app./bn PPP$ GDP	176.7	1	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	4.2	1	●
7.1.3	ICTs & business model creation†	45.2	112	○
7.1.4	ICTs & organizational model creation†	43.1	103	○
7.2	Creative goods & services	21.7	62	
7.2.1	Cultural & creative services exports, % total trade	0.8	23	
7.2.2	National feature films/mn pop. 15–69	1.1	72	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	2.4	20	●
7.2.5	Creative goods exports, % total trade	0.1	99	○
7.3	Online creativity	4.3	93	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.9	73	
7.3.2	Country-code TLDs/th pop. 15–69	4.0	59	
7.3.3	Wikipedia edits/pop. 15–69	812.6	83	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Mongolia

Key indicators

Population (millions)	2.9
GDP (US$ billions)	12.0
GDP per capita, PPP$	6,630.6
Income group	Lower-middle income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**36.4**	**66**	
Innovation Output Sub-Index		27.6	73	
Innovation Input Sub-Index		45.2	53	
Innovation Efficiency Ratio		0.6	111	
Global Innovation Index 2014 (out of 143)		37.5	56	
1	**Institutions**	**63.4**	**60**	
1.1	Political environment	51.6	66	
1.1.1	Political stability*	76.5	44	
1.1.2	Government effectiveness*	26.8	103	
1.2	Regulatory environment	68.9	58	
1.2.1	Regulatory quality*	40.2	89	
1.2.2	Rule of law*	37.8	82	
1.2.3	Cost of redundancy dismissal, salary weeks	8.6	20	●
1.3	Business environment	69.7	66	
1.3.1	Ease of starting a business*	91.3	37	
1.3.2	Ease of resolving insolvency*	43.9	84	
1.3.3	Ease of paying taxes*	73.8	66	
2	**Human capital & research**	**26.4**	**79**	
2.1	Education	45.6	66	
2.1.1	Expenditure on education, % GDP	5.5	42	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	17.8	70	
2.1.3	School life expectancy, years◴	14.6	48	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	14.5	58	
2.2	Tertiary education	30.7	73	
2.2.1	Tertiary enrolment, % gross	62.3	35	
2.2.2	Graduates in science & engineering, %◴	17.6	65	
2.2.3	Tertiary inbound mobility, %	0.6	89	
2.3	Research & development (R&D)	2.9	94	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	0.3	81	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**43.5**	**52**	
3.1	Information & communication technologies (ICTs)	48.7	64	
3.1.1	ICT access*	47.9	82	
3.1.2	ICT use*	16.9	95	
3.1.3	Government's online service*	61.4	43	
3.1.4	E-participation*	68.6	30	
3.2	General infrastructure	54.7	14	●
3.2.1	Electricity output, kWh/cap	1720.0	80	
3.2.2	Logistics performance*	9.9	120	○
3.2.3	Gross capital formation, % GDP	54.3	1	●
3.3	Ecological sustainability	27.1	111	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	5.2	94	
3.3.2	Environmental performance*	44.7	95	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	127	○
4	**Market sophistication**	**55.9**	**33**	
4.1	Credit	58.7	12	●
4.1.1	Ease of getting credit*	55.0	56	
4.1.2	Domestic credit to private sector, % GDP	67.3	52	
4.1.3	Microfinance gross loans, % GDP	18.9	1	●
4.2	Investment	35.7	66	
4.2.1	Ease of protecting investors*	67.5	17	●
4.2.2	Market capitalization, % GDP	12.5	82	
4.2.3	Total value of stocks traded, % GDP	0.4	82	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	73.4	84	
4.3.1	Applied tariff rate, weighted mean, %◴	5.1	83	
4.3.2	Intensity of local competition†	64.7	79	
5	**Business sophistication**	**36.9**	**55**	
5.1	Knowledge workers	41.9	56	
5.1.1	Knowledge-intensive employment, %◴	24.3	61	
5.1.2	Firms offering formal training, % firms	62.3	9	●
5.1.3	GERD performed by business, % of GDP	0.0	80	○
5.1.4	GERD financed by business, %	8.3	71	
5.1.5	Females employed w/advanced degrees, % total◴	15.4	36	
5.2	Innovation linkages	24.1	106	
5.2.1	University/industry research collaboration†	33.1	111	○
5.2.2	State of cluster development†	30.8	128	○
5.2.3	GERD financed by abroad, %	4.9	64	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	20	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.1	40	
5.3	Knowledge absorption	44.8	28	
5.3.1	Royalty & license fees payments, % total trade	0.2	84	
5.3.2	High-tech imports less re-imports, % total trade	6.8	67	
5.3.3	Comm., computer & info. services imp., % total trade	1.7	26	
5.3.4	FDI net inflows, % GDP	18.7	6	●
6	**Knowledge & technology outputs**	**23.8**	**85**	
6.1	Knowledge creation	50.6	13	●
6.1.1	Domestic resident patent app./bn PPP$ GDP◴	5.4	20	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP◴	6.2	5	●
6.1.4	Scientific & technical articles/bn PPP$ GDP	6.1	91	
6.1.5	Citable documents H index	61.0	104	
6.2	Knowledge impact	4.5	132	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.5	122	○
6.2.5	High- & medium-high-tech manufactures, %	5.5	88	○
6.3	Knowledge diffusion	16.4	125	○
6.3.1	Royalty & license fees receipts, % total trade	0.0	91	
6.3.2	High-tech exports less re-exports, % total trade	0.4	83	
6.3.3	Comm., computer & info. services exp., % total trade	0.2	110	○
6.3.4	FDI net outflows, % GDP	0.4	73	
7	**Creative outputs**	**31.3**	**74**	
7.1	Intangible assets	49.3	50	
7.1.1	Domestic res trademark app./bn PPP$ GDP	135.2	3	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.0	62	○
7.1.3	ICTs & business model creation†	52.2	81	
7.1.4	ICTs & organizational model creation†	44.0	100	
7.2	Creative goods & services	23.4	54	
7.2.1	Cultural & creative services exports, % total trade◴	0.0	64	
7.2.2	National feature films/mn pop. 15–69	10.5	16	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	2.9	12	●
7.2.5	Creative goods exports, % total trade	0.1	105	
7.3	Online creativity	3.4	100	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.7	109	
7.3.2	Country-code TLDs/th pop. 15–69	2.1	71	
7.3.3	Wikipedia edits/pop. 15–69	984.7	75	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Montenegro

Key indicators

Population (millions)	0.6
GDP (US$ billions)	4.5
GDP per capita, PPP$	12,412.0
Income group	Upper-middle income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**41.2**	**41**	
Innovation Output Sub-Index		36.5	40	
Innovation Input Sub-Index		45.9	50	
Innovation Efficiency Ratio		0.8	29	●
Global Innovation Index 2014 (out of 143)		37.0	59	
1	**Institutions**	**69.5**	**47**	
1.1	Political environment	60.9	51	
1.1.1	Political stability*	76.1	45	
1.1.2	Government effectiveness*	45.6	60	
1.2	Regulatory environment	71.1	48	
1.2.1	Regulatory quality*	49.1	71	
1.2.2	Rule of law*	48.2	61	
1.2.3	Cost of redundancy dismissal, salary weeks	11.2	42	
1.3	Business environment	76.6	38	
1.3.1	Ease of starting a business*	90.1	47	
1.3.2	Ease of resolving insolvency*	68.2	31	●
1.3.3	Ease of paying taxes*	71.6	77	
2	**Human capital & research**	**35.9**	**49**	
2.1	Education	54.3	33	
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years◴	15.2	39	
2.1.4	PISA scales in reading, maths, & science	413.9	49	○
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	47.2	23	
2.2.1	Tertiary enrolment, % gross◴	55.5	46	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	6.2	77	
2.3.1	Researchers, FTE/mn pop.◴	762.9	52	
2.3.2	Gross expenditure on R&D, % GDP◴	0.4	68	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**39.3**	**70**	
3.1	Information & communication technologies (ICTs)	53.2	51	
3.1.1	ICT access*	67.4	51	
3.1.2	ICT use*	33.7	62	
3.1.3	Government's online service*	52.8	60	
3.1.4	E-participation*	58.8	49	
3.2	General infrastructure	27.5	84	
3.2.1	Electricity output, kWh/cap	4587.1	47	
3.2.2	Logistics performance*	36.4	64	
3.2.3	Gross capital formation, % GDP	19.6	92	
3.3	Ecological sustainability	37.2	73	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.2	85	○
3.3.2	Environmental performance*	55.5	57	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.6	39	
4	**Market sophistication**	**51.0**	**50**	
4.1	Credit	38.3	47	
4.1.1	Ease of getting credit*	90.0	4	●
4.1.2	Domestic credit to private sector, % GDP	53.6	62	
4.1.3	Microfinance gross loans, % GDP	0.7	42	
4.2	Investment	45.2	40	
4.2.1	Ease of protecting investors*	60.8	41	
4.2.2	Market capitalization, % GDP	94.6	17	●
4.2.3	Total value of stocks traded, % GDP	1.1	64	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	69.5	97	
4.3.1	Applied tariff rate, weighted mean, %	2.6	54	
4.3.2	Intensity of local competition†	48.0	128	○
5	**Business sophistication**	**34.0**	**71**	
5.1	Knowledge workers	35.1	80	
5.1.1	Knowledge-intensive employment, %◴	37.2	29	
5.1.2	Firms offering formal training, % firms	23.7	81	○
5.1.3	GERD performed by business, % of GDP◴	0.1	60	
5.1.4	GERD financed by business, %◴	22.3	57	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	29.0	85	
5.2.1	University/industry research collaboration†	49.1	45	
5.2.2	State of cluster development†	33.8	117	○
5.2.3	GERD financed by abroad, %◴	15.3	31	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.1	39	
5.3	Knowledge absorption	38.0	47	
5.3.1	Royalty & license fees payments, % total trade	0.2	88	○
5.3.2	High-tech imports less re-imports, % total trade	4.9	102	○
5.3.3	Comm., computer & info. services imp., % total trade	1.9	19	●
5.3.4	FDI net inflows, % GDP	10.1	12	●
6	**Knowledge & technology outputs**	**28.4**	**54**	
6.1	Knowledge creation	13.5	63	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.5	39	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	63	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	21.6	37	
6.1.5	Citable documents H index	23.0	138	○
6.2	Knowledge impact	48.6	23	
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64◴	10.7	11	●
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	12.9	30	●
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	23.3	97	○
6.3.1	Royalty & license fees receipts, % total trade	0.0	78	
6.3.2	High-tech exports less re-exports, % total trade	0.3	89	
6.3.3	Comm., computer & info. services exp., % total trade	2.0	39	
6.3.4	FDI net outflows, % GDP	0.4	68	
7	**Creative outputs**	**44.6**	**26**	●
7.1	Intangible assets	48.1	59	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.5	20	
7.1.3	ICTs & business model creation†	53.8	75	
7.1.4	ICTs & organizational model creation†	48.9	82	
7.2	Creative goods & services	28.8	41	
7.2.1	Cultural & creative services exports, % total trade	1.3	7	●
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.1	85	
7.3	Online creativity	53.3	20	●
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.7	94	
7.3.2	Country-code TLDs/th pop. 15–69	100.0	1	●
7.3.3	Wikipedia edits/pop. 15–69	5218.3	24	●
7.3.4	Video uploads on YouTube/pop. 15–69	73.1	52	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Morocco

Key indicators

Population (millions)	33.5
GDP (US$ billions)	109.2
GDP per capita, PPP$	5,699.1
Income group	Lower-middle income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**33.2**	**78**	
Innovation Output Sub-Index		25.8	84	
Innovation Input Sub-Index		40.5	76	
Innovation Efficiency Ratio		0.6	102	
Global Innovation Index 2014 (out of 143)		32.2	84	
1	**Institutions**	**57.6**	**78**	
1.1	Political environment	45.6	80	
1.1.1	Political stability*	51.8	96	
1.1.2	Government effectiveness*	39.4	74	
1.2	Regulatory environment	58.5	92	
1.2.1	Regulatory quality*	43.3	84	
1.2.2	Rule of law*	41.0	74	
1.2.3	Cost of redundancy dismissal, salary weeks	20.7	95	
1.3	Business environment	68.8	68	
1.3.1	Ease of starting a business*	90.3	45	
1.3.2	Ease of resolving insolvency*	38.5	104	
1.3.3	Ease of paying taxes*	77.7	54	
2	**Human capital & research**	**32.6**	**56**	
2.1	Education	47.0	60	
2.1.1	Expenditure on education, % GDP	6.6	20	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	36.5	11	●
2.1.3	School life expectancy, years[d]	11.6	96	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary[d]	18.7	80	
2.2	Tertiary education	41.5	38	●
2.2.1	Tertiary enrolment, % gross[d]	16.2	97	
2.2.2	Graduates in science & engineering, %[d]	34.9	5	●
2.2.3	Tertiary inbound mobility, %[d]	1.9	66	
2.3	Research & development (R&D)	9.2	70	
2.3.1	Researchers, FTE/mn pop.[d]	864.5	48	
2.3.2	Gross expenditure on R&D, % GDP[d]	0.7	47	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**45.9**	**46**	
3.1	Information & communication technologies (ICTs)	57.7	45	
3.1.1	ICT access*	56.3	69	
3.1.2	ICT use*	25.0	83	
3.1.3	Government's online service*	69.3	30	●
3.1.4	E-participation*	80.4	17	●
3.2	General infrastructure	39.2	42	●
3.2.1	Electricity output, kWh/cap	840.6	96	○
3.2.2	Logistics performance*	n/a	n/a	
3.2.3	Gross capital formation, % GDP	34.3	12	●
3.3	Ecological sustainability	40.7	55	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	10.8	20	●
3.3.2	Environmental performance*	51.9	72	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	92	
4	**Market sophistication**	**45.1**	**82**	
4.1	Credit	22.9	100	
4.1.1	Ease of getting credit*	40.0	93	
4.1.2	Domestic credit to private sector, % GDP	70.2	49	
4.1.3	Microfinance gross loans, % GDP	0.5	44	
4.2	Investment	32.1	83	
4.2.1	Ease of protecting investors*	45.8	107	○
4.2.2	Market capitalization, % GDP	54.9	34	●
4.2.3	Total value of stocks traded, % GDP	3.7	53	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	80.3	52	
4.3.1	Applied tariff rate, weighted mean, %	3.4	60	
4.3.2	Intensity of local competition†	72.4	46	
5	**Business sophistication**	**21.5**	**134**	○
5.1	Knowledge workers	20.5	122	○
5.1.1	Knowledge-intensive employment, %[d]	6.8	106	○
5.1.2	Firms offering formal training, % firms[d]	24.7	79	
5.1.3	GERD performed by business, % of GDP[d]	0.2	47	
5.1.4	GERD financed by business, %[d]	29.9	49	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	20.0	124	○
5.2.1	University/industry research collaboration†	37.2	93	
5.2.2	State of cluster development†	46.3	68	
5.2.3	GERD financed by abroad, %[d]	1.7	82	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	70	
5.2.5	Patent families 3+ offices/bn PPP$ GDP[d]	0.0	95	○
5.3	Knowledge absorption	24.1	121	○
5.3.1	Royalty & license fees payments, % total trade	0.2	89	
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade[d]	0.4	106	○
5.3.4	FDI net inflows, % GDP	3.2	58	
6	**Knowledge & technology outputs**	**25.2**	**73**	
6.1	Knowledge creation	7.9	86	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.3	58	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.2	50	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	6.4	89	
6.1.5	Citable documents H index	109.0	67	
6.2	Knowledge impact	37.4	69	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.6	19	●
6.2.2	New businesses/th pop. 15–64[d]	1.3	60	
6.2.3	Computer software spending, % GDP	0.3	56	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	2.9	85	
6.2.5	High- & medium-high-tech manufactures, %	28.3	40	
6.3	Knowledge diffusion	30.2	57	
6.3.1	Royalty & license fees receipts, % total trade	0.0	101	○
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade[d]	2.7	23	●
6.3.4	FDI net outflows, % GDP	0.4	67	
7	**Creative outputs**	**26.5**	**91**	
7.1	Intangible assets	37.0	106	
7.1.1	Domestic res trademark app./bn PPP$ GDP	54.6	40	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.3	48	
7.1.3	ICTs & business model creation†	51.3	85	
7.1.4	ICTs & organizational model creation†	44.6	97	
7.2	Creative goods & services	12.2	90	
7.2.1	Cultural & creative services exports, % total trade	0.6	32	
7.2.2	National feature films/mn pop. 15–69	1.0	77	
7.2.3	Global ent. & media output/th pop. 15–69	0.6	55	○
7.2.4	Printing & publishing output manufactures, %	0.8	80	○
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	19.9	65	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.8	92	
7.3.2	Country-code TLDs/th pop. 15–69	0.8	88	
7.3.3	Wikipedia edits/pop. 15–69	390.4	96	
7.3.4	Video uploads on YouTube/pop. 15–69	74.1	47	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[d] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Mozambique

Key indicators

Population (millions)	26.5
GDP (US$ billions)	16.7
GDP per capita, PPP$	1,170.2
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**30.1**	**95**	
Innovation Output Sub-Index		23.3	97	
Innovation Input Sub-Index		36.9	93	
Innovation Efficiency Ratio		0.6	104	
Global Innovation Index 2014 (out of 143)		28.5	107	
1	**Institutions**	**46.8**	**116**	
1.1	Political environment	40.7	99	
1.1.1	Political stability*	57.5	82	
1.1.2	Government effectiveness*	23.9	108	
1.2	Regulatory environment	36.2	133	○
1.2.1	Regulatory quality*	36.8	104	
1.2.2	Rule of law*	25.1	117	
1.2.3	Cost of redundancy dismissal, salary weeks	37.5	134	○
1.3	Business environment	63.5	89	
1.3.1	Ease of starting a business*	83.0	87	
1.3.2	Ease of resolving insolvency*	40.8	99	
1.3.3	Ease of paying taxes*	66.9	97	
2	**Human capital & research**	**21.1**	**102**	
2.1	Education	51.4	44	●
2.1.1	Expenditure on education, % GDP◴	5.0	57	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	86.0	1	●
2.1.3	School life expectancy, years	9.3	118	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	31.2	109	
2.2	Tertiary education	8.3	125	
2.2.1	Tertiary enrolment, % gross	5.2	124	○
2.2.2	Graduates in science & engineering, %◴	8.9	99	○
2.2.3	Tertiary inbound mobility, %	0.3	102	
2.3	Research & development (R&D)	3.7	87	
2.3.1	Researchers, FTE/mn pop.◴	38.1	96	
2.3.2	Gross expenditure on R&D, % GDP◴	0.5	66	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**28.5**	**105**	
3.1	Information & communication technologies (ICTs)	22.3	118	
3.1.1	ICT access*	22.1	131	○
3.1.2	ICT use*	2.4	129	○
3.1.3	Government's online service*	31.5	98	
3.1.4	E-participation*	33.3	92	
3.2	General infrastructure	47.0	24	●
3.2.1	Electricity output, kWh/cap	601.8	104	
3.2.2	Logistics performance*	3.5	128	○
3.2.3	Gross capital formation, % GDP	50.1	3	●
3.3	Ecological sustainability	16.0	139	○
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	2.1	120	○
3.3.2	Environmental performance*	30.0	128	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.6	77	
4	**Market sophistication**	**46.0**	**76**	
4.1	Credit	13.7	125	
4.1.1	Ease of getting credit*	30.0	113	
4.1.2	Domestic credit to private sector, % GDP	28.9	101	
4.1.3	Microfinance gross loans, % GDP	0.2	53	
4.2	Investment	51.7	23	
4.2.1	Ease of protecting investors*	51.7	83	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	72.7	86	
4.3.1	Applied tariff rate, weighted mean, %◴	4.8	78	
4.3.2	Intensity of local competition†	61.9	93	
5	**Business sophistication**	**41.9**	**36**	●
5.1	Knowledge workers	16.9	128	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	22.1	85	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total◴	0.5	86	○
5.2	Innovation linkages	57.9	5	●
5.2.1	University/industry research collaboration†	38.0	86	
5.2.2	State of cluster development†	42.5	82	
5.2.3	GERD financed by abroad, %◴	78.1	1	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	36	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	51.0	12	●
5.3.1	Royalty & license fees payments, % total trade◴	0.1	102	
5.3.2	High-tech imports less re-imports, % total trade	14.4	16	●
5.3.3	Comm., computer & info. services imp., % total trade◴	0.7	79	
5.3.4	FDI net inflows, % GDP	42.1	1	●
6	**Knowledge & technology outputs**	**29.0**	**52**	●
6.1	Knowledge creation	6.5	92	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	5.5	94	
6.1.5	Citable documents H index	60.0	105	
6.2	Knowledge impact	53.4	14	
6.2.1	Growth rate of PPP$ GDP/worker, %	4.0	14	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.8	97	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	27.0	71	●
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	77	
6.3.2	High-tech exports less re-exports, % total trade	0.8	69	●
6.3.3	Comm., computer & info. services exp., % total trade◴	0.4	95	
6.3.4	FDI net outflows, % GDP	3.3	19	●
7	**Creative outputs**	**17.6**	**128**	
7.1	Intangible assets	33.7	119	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.1	58	
7.1.3	ICTs & business model creation†	44.1	115	
7.1.4	ICTs & organizational model creation†	39.4	119	
7.2	Creative goods & services	2.9	120	
7.2.1	Cultural & creative services exports, % total trade	0.1	55	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.0	117	
7.3	Online creativity	0.1	134	○
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.0	137	○
7.3.2	Country-code TLDs/th pop. 15–69	0.1	119	
7.3.3	Wikipedia edits/pop. 15–69	27.5	129	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Myanmar

Key indicators

Population (millions)	53.7
GDP (US$ billions)	62.8
GDP per capita, PPP$	1,866.9
Income group	Low income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**20.3**	**138**	
Innovation Output Sub-Index		16.6	130	
Innovation Input Sub-Index		23.9	139	
Innovation Efficiency Ratio		0.7	75	●
Global Innovation Index 2014 (out of 143)		19.6	140	
1	**Institutions**	**33.3**	**137**	
1.1	Political environment	18.1	137	
1.1.1	Political stability*	35.6	122	
1.1.2	Government effectiveness*	0.6	140	○
1.2	Regulatory environment	43.6	124	
1.2.1	Regulatory quality*	7.6	138	
1.2.2	Rule of law*	15.2	134	
1.2.3	Cost of redundancy dismissal, salary weeks	20.2	92	●
1.3	Business environment	38.3	139	
1.3.1	Ease of starting a business*	22.9	141	○
1.3.2	Ease of resolving insolvency*	23.5	134	
1.3.3	Ease of paying taxes*	68.6	91	●
2	**Human capital & research**	**22.7**	**97**	●
2.1	Education	15.4	140	○
2.1.1	Expenditure on education, % GDP	0.8	129	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years◴	8.6	125	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	34.1	114	
2.2	Tertiary education	52.6	14	●
2.2.1	Tertiary enrolment, % gross	13.4	102	●
2.2.2	Graduates in science & engineering, %	47.1	2	●
2.2.3	Tertiary inbound mobility, %	0.0	116	○
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**16.2**	**139**	
3.1	Information & communication technologies (ICTs)	7.4	139	
3.1.1	ICT access*	18.5	136	○
3.1.2	ICT use*	0.8	136	○
3.1.3	Government's online service*	2.4	138	
3.1.4	E-participation*	7.8	137	
3.2	General infrastructure	19.3	122	
3.2.1	Electricity output, kWh/cap	203.3	114	
3.2.2	Logistics performance*	4.5	126	
3.2.3	Gross capital formation, % GDP	24.7	47	●
3.3	Ecological sustainability	21.8	130	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.1	90	●
3.3.2	Environmental performance*	27.4	133	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.0	136	
4	**Market sophistication**	**36.4**	**125**	
4.1	Credit	5.0	139	
4.1.1	Ease of getting credit*	10.0	133	
4.1.2	Domestic credit to private sector, % GDP◴	4.7	139	○
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	29.2	100s	
4.2.1	Ease of protecting investors*	29.2	139	○
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	75.2	77	●
4.3.1	Applied tariff rate, weighted mean, %◴	3.2	59	●
4.3.2	Intensity of local competition†	61.3	96	●
5	**Business sophistication**	**11.0**	**141**	○
5.1	Knowledge workers	15.4	129	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms	15.1	100	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	17.5	132	
5.2.1	University/industry research collaboration†	20.8	130	
5.2.2	State of cluster development†	28.2	130	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	59	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	92	
5.3	Knowledge absorption	0.0	141	○
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	2.0	129	○
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	n/a	n/a	
6	**Knowledge & technology outputs**	**20.0**	**103**	●
6.1	Knowledge creation	1.5	138	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	0.3	140	○
6.1.5	Citable documents H index	41.0	126	
6.2	Knowledge impact	58.4	4	●
6.2.1	Growth rate of PPP$ GDP/worker, %	5.2	7	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.5	125	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	0.0	140	○
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.0	128	○
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**13.3**	**136**	
7.1	Intangible assets	25.7	133	
7.1.1	Domestic res trademark app./bn PPP$ GDP◴	21.9	79	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	34.5	130	
7.1.4	ICTs & organizational model creation†	31.5	129	
7.2	Creative goods & services	1.6	129	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69◴	0.7	85	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade◴	0.0	111	
7.3	Online creativity	0.1	138	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.0	138	
7.3.2	Country-code TLDs/th pop. 15–69	0.0	135	
7.3.3	Wikipedia edits/pop. 15–69	21.1	133	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Namibia

Key indicators

Population (millions)	2.3
GDP (US$ billions)	13.4
GDP per capita, PPP$	8,603.1
Income group	Upper-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**28.1**	**107**	
Innovation Output Sub-Index		19.1	119	
Innovation Input Sub-Index		37.2	91	
Innovation Efficiency Ratio		0.5	126	○
Global Innovation Index 2014 (out of 143)		28.5	108	
1	**Institutions**	**67.9**	**53**	
1.1	Political environment	66.9	47	●
1.1.1	Political stability*	87.1	23	●
1.1.2	Government effectiveness*	46.6	59	
1.2	Regulatory environment	74.2	43	●
1.2.1	Regulatory quality*	49.2	70	
1.2.2	Rule of law*	54.3	54	
1.2.3	Cost of redundancy dismissal, salary weeks	9.6	32	●
1.3	Business environment	62.6	95	
1.3.1	Ease of starting a business*	68.7	123	○
1.3.2	Ease of resolving insolvency*	45.5	76	
1.3.3	Ease of paying taxes*	73.6	67	
2	**Human capital & research**	**18.4**	**108**	
2.1	Education	41.0	83	
2.1.1	Expenditure on education, % GDP◴	8.5	4	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	15.8	81	
2.1.3	School life expectancy, years◴	11.3	99	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	24.6	93	
2.2	Tertiary education	12.7	119	○
2.2.1	Tertiary enrolment, % gross◴	9.3	115	
2.2.2	Graduates in science & engineering, %◴	2.6	101	○
2.2.3	Tertiary inbound mobility, %◴	10.2	16	●
2.3	Research & development (R&D)	1.6	110	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP◴	0.1	100	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**32.4**	**93**	
3.1	Information & communication technologies (ICTs)	30.4	105	
3.1.1	ICT access*	39.3	104	
3.1.2	ICT use*	16.7	97	
3.1.3	Government's online service*	32.3	95	
3.1.4	E-participation*	33.3	92	
3.2	General infrastructure	28.0	80	
3.2.1	Electricity output, kWh/cap	727.0	100	
3.2.2	Logistics performance*	25.3	88	
3.2.3	Gross capital formation, % GDP	27.3	34	●
3.3	Ecological sustainability	38.8	64	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	11.4	18	●
3.3.2	Environmental performance*	43.7	100	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.5	83	
4	**Market sophistication**	**39.9**	**112**	
4.1	Credit	23.2	98	
4.1.1	Ease of getting credit*	55.0	56	
4.1.2	Domestic credit to private sector, % GDP	47.0	69	
4.1.3	Microfinance gross loans, % GDP◴	0.0	75	
4.2	Investment	28.2	103	
4.2.1	Ease of protecting investors*	53.3	79	
4.2.2	Market capitalization, % GDP	10.0	89	
4.2.3	Total value of stocks traded, % GDP	0.2	95	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	68.2	102	
4.3.1	Applied tariff rate, weighted mean, %	6.9	101	
4.3.2	Intensity of local competition†	60.7	100	
5	**Business sophistication**	**27.3**	**109**	
5.1	Knowledge workers	30.4	93	
5.1.1	Knowledge-intensive employment, %	14.6	95	
5.1.2	Firms offering formal training, % firms◴	44.5	37	●
5.1.3	GERD performed by business, % of GDP◴	0.0	78	○
5.1.4	GERD financed by business, %◴	19.8	61	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	26.2	95	
5.2.1	University/industry research collaboration†	41.0	76	
5.2.2	State of cluster development†	46.8	65	
5.2.3	GERD financed by abroad, %◴	1.5	85	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	28	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.1	44	
5.3	Knowledge absorption	25.3	112	
5.3.1	Royalty & license fees payments, % total trade	0.1	109	○
5.3.2	High-tech imports less re-imports, % total trade	6.3	76	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.5	87	
5.3.4	FDI net inflows, % GDP	5.6	29	●
6	**Knowledge & technology outputs**	**8.5**	**138**	○
6.1	Knowledge creation	5.5	99	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	60	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	6.7	86	
6.1.5	Citable documents H index	62.0	102	
6.2	Knowledge impact	4.2	133	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	0.9	76	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.4	107	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	15.8	127	○
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	112	○
6.3.2	High-tech exports less re-exports, % total trade	1.1	62	
6.3.3	Comm., computer & info. services exp., % total trade	0.2	116	○
6.3.4	FDI net outflows, % GDP	0.2	82	
7	**Creative outputs**	**29.7**	**80**	
7.1	Intangible assets	49.4	49	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	51.2	88	
7.1.4	ICTs & organizational model creation†	47.6	90	
7.2	Creative goods & services	16.1	81	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.6	53	
7.3	Online creativity	4.0	95	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	10.3	44	●
7.3.2	Country-code TLDs/th pop. 15–69	0.1	127	○
7.3.3	Wikipedia edits/pop. 15–69	224.1	106	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Nepal

Key indicators

Population (millions)	28.1
GDP (US$ billions)	19.6
GDP per capita, PPP$	1,575.7
Income group	Low income
Region	Central and Southern Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**21.1**	**135**	○
Innovation Output Sub-Index		12.1	136	○
Innovation Input Sub-Index		30.0	127	
Innovation Efficiency Ratio		0.4	134	○
Global Innovation Index 2014 (out of 143)		23.8	136	
1	**Institutions**	**45.1**	**121**	
1.1	Political environment	26.1	128	○
1.1.1	Political stability*	35.9	120	
1.1.2	Government effectiveness*	16.3	125	
1.2	Regulatory environment	44.1	123	
1.2.1	Regulatory quality*	24.8	122	
1.2.2	Rule of law*	27.5	110	
1.2.3	Cost of redundancy dismissal, salary weeks	27.2	116	
1.3	Business environment	65.0	85	
1.3.1	Ease of starting a business*	83.0	84	
1.3.2	Ease of resolving insolvency*	45.4	77	●
1.3.3	Ease of paying taxes*	66.5	100	
2	**Human capital & research**	**16.0**	**117**	
2.1	Education	31.4	113	
2.1.1	Expenditure on education, % GDP◴	4.7	67	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	12.2	91	
2.1.3	School life expectancy, years◴	12.4	87	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	29.2	106	
2.2	Tertiary education	13.2	116	
2.2.1	Tertiary enrolment, % gross◴	14.5	100	
2.2.2	Graduates in science & engineering, %◴	11.8	96	○
2.2.3	Tertiary inbound mobility, %◴	0.0	115	○
2.3	Research & development (R&D)	3.5	89	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP◴	0.3	76	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**24.1**	**116**	
3.1	Information & communication technologies (ICTs)	20.3	121	
3.1.1	ICT access*	27.0	121	
3.1.2	ICT use*	9.2	113	
3.1.3	Government's online service*	15.7	126	○
3.1.4	E-participation*	29.4	104	
3.2	General infrastructure	28.0	79	●
3.2.1	Electricity output, kWh/cap	129.3	118	○
3.2.2	Logistics performance*	21.8	99	
3.2.3	Gross capital formation, % GDP	28.9	28	●
3.3	Ecological sustainability	23.9	125	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	5.2	97	
3.3.2	Environmental performance*	37.0	116	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	123	
4	**Market sophistication**	**37.9**	**121**	
4.1	Credit	20.9	109	
4.1.1	Ease of getting credit*	35.0	102	
4.1.2	Domestic credit to private sector, % GDP	58.1	57	●
4.1.3	Microfinance gross loans, % GDP◴	0.8	40	●
4.2	Investment	31.7	87	
4.2.1	Ease of protecting investors*	56.7	67	●
4.2.2	Market capitalization, % GDP	21.7	66	
4.2.3	Total value of stocks traded, % GDP	0.3	86	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	61.0	125	
4.3.1	Applied tariff rate, weighted mean, %	11.6	128	○
4.3.2	Intensity of local competition†	62.8	91	
5	**Business sophistication**	**27.1**	**111**	
5.1	Knowledge workers	21.8	116	
5.1.1	Knowledge-intensive employment, %◴	4.3	109	○
5.1.2	Firms offering formal training, % firms	31.9	59	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	29.1	84	
5.2.1	University/industry research collaboration†	27.3	123	○
5.2.2	State of cluster development†	39.1	99	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	52	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	30.3	90	
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	6.0	84	
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	0.4	125	
6	**Knowledge & technology outputs**	**3.2**	**140**	○
6.1	Knowledge creation	6.7	90	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.3	85	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	7.4	78	●
6.1.5	Citable documents H index	80.0	89	
6.2	Knowledge impact	2.8	137	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	0.7	82	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.1	111	
6.2.5	High- & medium-high-tech manufactures, %◴	1.4	98	○
6.3	Knowledge diffusion	0.2	139	○
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.0	119	○
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**21.1**	**118**	
7.1	Intangible assets	33.2	122	
7.1.1	Domestic res trademark app./bn PPP$ GDP	39.9	62	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	39.3	120	
7.1.4	ICTs & organizational model creation†	39.0	120	
7.2	Creative goods & services	16.7	80	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	1.7	39	●
7.2.5	Creative goods exports, % total trade	0.3	73	●
7.3	Online creativity	1.0	113	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.6	115	
7.3.2	Country-code TLDs/th pop. 15–69	1.0	86	
7.3.3	Wikipedia edits/pop. 15–69	218.2	107	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Netherlands

Key indicators

Population (millions)	16.8
GDP (US$ billions)	866.4
GDP per capita, PPP$	42,585.9
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**61.6**	**4**	●
Innovation Output Sub-Index		58.9	3	●
Innovation Input Sub-Index		64.2	11	
Innovation Efficiency Ratio		0.9	8	
Global Innovation Index 2014 (out of 143)		60.6	5	
1	**Institutions**	**91.9**	**7**	
1.1	Political environment	90.5	10	
1.1.1	Political stability*	91.8	12	
1.1.2	Government effectiveness*	89.2	8	
1.2	Regulatory environment	97.0	5	●
1.2.1	Regulatory quality*	94.8	8	
1.2.2	Rule of law*	95.8	7	
1.2.3	Cost of redundancy dismissal, salary weeks	8.7	24	
1.3	Business environment	88.2	9	
1.3.1	Ease of starting a business*	94.1	20	
1.3.2	Ease of resolving insolvency*	83.8	11	
1.3.3	Ease of paying taxes*	86.8	22	
2	**Human capital & research**	**51.7**	**17**	
2.1	Education	58.2	14	
2.1.1	Expenditure on education, % GDP	5.9	32	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	25.9	33	
2.1.3	School life expectancy, years	17.9	7	
2.1.4	PISA scales in reading, maths, & science	518.8	10	
2.1.5	Pupil-teacher ratio, secondary	13.9	51	○
2.2	Tertiary education	37.4	52	○
2.2.1	Tertiary enrolment, % gross	77.3	15	
2.2.2	Graduates in science & engineering, %	14.4	85	○
2.2.3	Tertiary inbound mobility, %	7.2	24	
2.3	Research & development (R&D)	59.5	15	
2.3.1	Researchers, FTE/mn pop.	4315.5	15	
2.3.2	Gross expenditure on R&D, % GDP	2.1	16	
2.3.3	QS university ranking, average score top 3*	76.7	12	
3	**Infrastructure**	**60.5**	**13**	
3.1	Information & communication technologies (ICTs)	89.1	2	●
3.1.1	ICT access*	89.3	9	
3.1.2	ICT use*	74.3	12	
3.1.3	Government's online service*	92.9	8	
3.1.4	E-participation*	100.0	1	●
3.2	General infrastructure	42.4	34	
3.2.1	Electricity output, kWh/cap	5879.5	33	
3.2.2	Logistics performance*	96.2	2	●
3.2.3	Gross capital formation, % GDP	18.1	108	○
3.3	Ecological sustainability	49.9	28	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.9	52	○
3.3.2	Environmental performance*	77.8	11	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	3.1	34	
4	**Market sophistication**	**61.8**	**17**	
4.1	Credit	54.3	18	
4.1.1	Ease of getting credit*	50.0	65	○
4.1.2	Domestic credit to private sector, % GDP	178.0	6	●
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	42.2	48	
4.2.1	Ease of protecting investors*	51.7	83	○
4.2.2	Market capitalization, % GDP	79.1	20	
4.2.3	Total value of stocks traded, % GDP	53.6	16	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	21	
4.3	Trade & competition	88.9	9	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	81.1	12	
5	**Business sophistication**	**55.3**	**10**	
5.1	Knowledge workers	61.3	19	
5.1.1	Knowledge-intensive employment, %	46.4	9	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	1.2	18	
5.1.4	GERD financed by business, %	47.1	22	
5.1.5	Females employed w/advanced degrees, % total	17.8	28	
5.2	Innovation linkages	49.0	16	
5.2.1	University/industry research collaboration†	73.0	9	
5.2.2	State of cluster development†	72.4	6	●
5.2.3	GERD financed by abroad, %	14.3	32	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	34	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	1.3	13	
5.3	Knowledge absorption	55.5	7	
5.3.1	Royalty & license fees payments, % total trade	4.2	1	●
5.3.2	High-tech imports less re-imports, % total trade	12.6	22	
5.3.3	Comm., computer & info. services imp., % total trade	1.6	37	
5.3.4	FDI net inflows, % GDP	4.0	39	
6	**Knowledge & technology outputs**	**55.9**	**6**	●
6.1	Knowledge creation	55.2	11	
6.1.1	Domestic resident patent app./bn PPP$ GDP	3.0	33	
6.1.2	PCT resident patent app./bn PPP$ GDP	5.3	9	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	43.8	13	
6.1.5	Citable documents H index	636.0	8	
6.2	Knowledge impact	48.1	26	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.4	87	○
6.2.2	New businesses/th pop. 15–64	4.4	26	
6.2.3	Computer software spending, % GDP	0.7	7	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	14.6	26	
6.2.5	High- & medium-high-tech manufactures, %◴	41.2	20	
6.3	Knowledge diffusion	64.5	5	●
6.3.1	Royalty & license fees receipts, % total trade	5.3	2	●
6.3.2	High-tech exports less re-exports, % total trade	13.3	13	
6.3.3	Comm., computer & info. services exp., % total trade	2.0	40	
6.3.4	FDI net outflows, % GDP	4.9	9	
7	**Creative outputs**	**61.9**	**4**	●
7.1	Intangible assets	58.4	15	
7.1.1	Domestic res trademark app./bn PPP$ GDP	59.6	37	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.8	15	
7.1.3	ICTs & business model creation†	76.6	5	●
7.1.4	ICTs & organizational model creation†	74.5	6	●
7.2	Creative goods & services	42.2	9	
7.2.1	Cultural & creative services exports, % total trade	0.5	36	○
7.2.2	National feature films/mn pop. 15–69	5.7	34	
7.2.3	Global ent. & media output/th pop. 15–69	49.9	12	
7.2.4	Printing & publishing output manufactures, %◴	1.8	32	
7.2.5	Creative goods exports, % total trade	5.6	8	
7.3	Online creativity	88.6	2	●
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	89.6	7	
7.3.2	Country-code TLDs/th pop. 15–69	100.0	1	●
7.3.3	Wikipedia edits/pop. 15–69	9406.7	6	●
7.3.4	Video uploads on YouTube/pop. 15–69	95.3	3	●

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

New Zealand

Key indicators

Population (millions)	4.6
GDP (US$ billions)	198.1
GDP per capita, PPP$	31,692.2
Income group	High income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**55.9**	**15**	
Innovation Output Sub-Index		48.7	15	
Innovation Input Sub-Index		63.1	13	
Innovation Efficiency Ratio		0.8	40	
Global Innovation Index 2014 (out of 143)		54.5	18	
1	**Institutions**	**93.0**	**5**	●
1.1	Political environment	94.3	4	●
1.1.1	Political stability*	100.0	1	●
1.1.2	Government effectiveness*	88.6	9	
1.2	Regulatory environment	98.3	3	●
1.2.1	Regulatory quality*	96.1	5	●
1.2.2	Rule of law*	97.1	5	●
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	86.5	13	
1.3.1	Ease of starting a business*	100.0	1	●
1.3.2	Ease of resolving insolvency*	71.6	26	
1.3.3	Ease of paying taxes*	88.0	21	
2	**Human capital & research**	**52.9**	**16**	
2.1	Education	62.1	10	
2.1.1	Expenditure on education, % GDP	7.4	11	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	25.2	37	
2.1.3	School life expectancy, years	19.2	2	●
2.1.4	PISA scales in reading, maths, & science	509.2	16	
2.1.5	Pupil-teacher ratio, secondary	14.4	57	○
2.2	Tertiary education	52.0	16	
2.2.1	Tertiary enrolment, % gross	79.8	11	
2.2.2	Graduates in science & engineering, %	18.8	61	○
2.2.3	Tertiary inbound mobility, %	15.8	10	
2.3	Research & development (R&D)	44.6	23	
2.3.1	Researchers, FTE/mn pop.◴	3692.9	23	
2.3.2	Gross expenditure on R&D, % GDP◴	1.3	29	
2.3.3	QS university ranking, average score top 3*	59.7	18	
3	**Infrastructure**	**56.3**	**20**	
3.1	Information & communication technologies (ICTs)	77.9	14	
3.1.1	ICT access*	77.9	27	
3.1.2	ICT use*	71.0	15	
3.1.3	Government's online service*	84.3	15	
3.1.4	E-participation*	78.4	19	
3.2	General infrastructure	46.3	27	
3.2.1	Electricity output, kWh/cap	9456.3	15	
3.2.2	Logistics performance*	75.6	22	
3.2.3	Gross capital formation, % GDP	22.1	66	
3.3	Ecological sustainability	44.7	47	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.4	82	○
3.3.2	Environmental performance*	76.4	16	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.8	49	
4	**Market sophistication**	**67.6**	**8**	
4.1	Credit	73.8	3	●
4.1.1	Ease of getting credit*	100.0	1	●
4.1.2	Domestic credit to private sector, % GDP◴	145.4	15	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	43.5	44	
4.2.1	Ease of protecting investors*	81.7	1	●
4.2.2	Market capitalization, % GDP	46.5	41	
4.2.3	Total value of stocks traded, % GDP	14.6	31	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	22	
4.3	Trade & competition	85.5	25	
4.3.1	Applied tariff rate, weighted mean, %◴	1.6	42	
4.3.2	Intensity of local competition†	76.5	24	
5	**Business sophistication**	**45.8**	**26**	
5.1	Knowledge workers	55.1	29	
5.1.1	Knowledge-intensive employment, %◴	42.9	17	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	0.6	32	
5.1.4	GERD financed by business, %◴	40.0	38	
5.1.5	Females employed w/advanced degrees, % total	20.8	20	
5.2	Innovation linkages	41.5	34	
5.2.1	University/industry research collaboration†	65.1	16	
5.2.2	State of cluster development†	50.1	50	
5.2.3	GERD financed by abroad, %◴	6.3	60	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	7	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.5	25	
5.3	Knowledge absorption	40.9	38	
5.3.1	Royalty & license fees payments, % total trade	1.9	10	
5.3.2	High-tech imports less re-imports, % total trade	9.5	40	
5.3.3	Comm., computer & info. services imp., % total trade	1.3	42	
5.3.4	FDI net inflows, % GDP	0.5	122	○
6	**Knowledge & technology outputs**	**42.0**	**20**	
6.1	Knowledge creation	54.8	12	
6.1.1	Domestic resident patent app./bn PPP$ GDP	10.6	6	●
6.1.2	PCT resident patent app./bn PPP$ GDP	2.2	19	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	51.9	7	●
6.1.5	Citable documents H index	318.0	26	
6.2	Knowledge impact	45.8	35	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.8	81	○
6.2.2	New businesses/th pop. 15–64	15.1	1	●
6.2.3	Computer software spending, % GDP	0.3	33	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	8.1	46	
6.2.5	High- & medium-high-tech manufactures, %◴	14.8	66	○
6.3	Knowledge diffusion	25.4	84	○
6.3.1	Royalty & license fees receipts, % total trade	0.6	22	
6.3.2	High-tech exports less re-exports, % total trade	1.5	55	
6.3.3	Comm., computer & info. services exp., % total trade	1.2	76	○
6.3.4	FDI net outflows, % GDP	-0.9	120	○
7	**Creative outputs**	**55.4**	**10**	
7.1	Intangible assets	63.0	9	
7.1.1	Domestic res trademark app./bn PPP$ GDP	95.2	15	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	2.1	12	
7.1.3	ICTs & business model creation†	72.8	15	
7.1.4	ICTs & organizational model creation†	69.5	15	
7.2	Creative goods & services	29.2	39	
7.2.1	Cultural & creative services exports, % total trade◴	0.9	17	
7.2.2	National feature films/mn pop. 15–69	7.9	24	
7.2.3	Global ent. & media output/th pop. 15–69	44.6	16	
7.2.4	Printing & publishing output manufactures, %◴	2.0	28	
7.2.5	Creative goods exports, % total trade	0.3	69	○
7.3	Online creativity	66.3	13	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	39.9	21	
7.3.2	Country-code TLDs/th pop. 15–69	78.4	12	
7.3.3	Wikipedia edits/pop. 15–69	7816.3	10	
7.3.4	Video uploads on YouTube/pop. 15–69	89.2	15	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Nicaragua

Key indicators

Population (millions)	6.2
GDP (US$ billions)	11.7
GDP per capita, PPP$	4,758.0
Income group	Lower-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**23.5**	**130**	
Innovation Output Sub-Index		15.0	133	○
Innovation Input Sub-Index		31.9	120	
Innovation Efficiency Ratio		0.5	130	
Global Innovation Index 2014 (out of 143)		25.5	125	
1	**Institutions**	**51.9**	**100**	
1.1	Political environment	38.7	104	
1.1.1	Political stability*	58.0	81	●
1.1.2	Government effectiveness*	19.3	118	
1.2	Regulatory environment	60.7	84	
1.2.1	Regulatory quality*	39.7	91	
1.2.2	Rule of law*	30.4	101	
1.2.3	Cost of redundancy dismissal, salary weeks	14.9	64	●
1.3	Business environment	56.5	113	
1.3.1	Ease of starting a business*	80.3	98	
1.3.2	Ease of resolving insolvency*	39.6	102	
1.3.3	Ease of paying taxes*	49.5	125	
2	**Human capital & research**	**10.4**	**139**	○
2.1	Education	20.9	134	○
2.1.1	Expenditure on education, % GDP◴	4.4	75	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	7.3	107	○
2.1.3	School life expectancy, years	n/a	n/a	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	30.8	107	
2.2	Tertiary education	n/a	n/a	
2.2.1	Tertiary enrolment, % gross	n/a	n/a	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**22.7**	**126**	
3.1	Information & communication technologies (ICTs)	16.5	130	
3.1.1	ICT access*	39.8	102	
3.1.2	ICT use*	6.8	117	
3.1.3	Government's online service*	9.4	135	○
3.1.4	E-participation*	9.8	133	○
3.2	General infrastructure	18.9	123	
3.2.1	Electricity output, kWh/cap	673.0	101	
3.2.2	Logistics performance*	25.1	90	
3.2.3	Gross capital formation, % GDP	19.0	101	
3.3	Ecological sustainability	32.8	87	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.8	70	
3.3.2	Environmental performance*	50.3	80	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	97	
4	**Market sophistication**	**41.6**	**104**	
4.1	Credit	28.8	78	●
4.1.1	Ease of getting credit*	45.0	80	
4.1.2	Domestic credit to private sector, % GDP	28.8	102	
4.1.3	Microfinance gross loans, % GDP	2.8	19	●
4.2	Investment	23.6	131	
4.2.1	Ease of protecting investors*	33.3	134	○
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	45	
4.3	Trade & competition	72.5	88	
4.3.1	Applied tariff rate, weighted mean, %◴	2.3	49	●
4.3.2	Intensity of local competition†	52.9	124	○
5	**Business sophistication**	**33.0**	**75**	●
5.1	Knowledge workers	41.0	59	
5.1.1	Knowledge-intensive employment, %◴	14.8	94	
5.1.2	Firms offering formal training, % firms◴	47.2	33	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	26.9	93	
5.2.1	University/industry research collaboration†	32.6	113	
5.2.2	State of cluster development†	37.5	107	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	108	○
5.3	Knowledge absorption	31.3	81	●
5.3.1	Royalty & license fees payments, % total trade	0.0	118	○
5.3.2	High-tech imports less re-imports, % total trade	6.5	73	●
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	7.5	17	●
6	**Knowledge & technology outputs**	**12.3**	**131**	
6.1	Knowledge creation	2.5	134	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.1	98	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.1	125	
6.1.5	Citable documents H index	51.0	114	
6.2	Knowledge impact	3.6	136	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.8	96	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	30.8	53	●
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.1	104	
6.3.3	Comm., computer & info. services exp., % total trade	2.4	29	●
6.3.4	FDI net outflows, % GDP	0.9	54	●
7	**Creative outputs**	**17.7**	**127**	
7.1	Intangible assets	32.5	124	
7.1.1	Domestic res trademark app./bn PPP$ GDP	41.2	60	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	37.0	128	○
7.1.4	ICTs & organizational model creation†	38.3	122	
7.2	Creative goods & services	2.8	122	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69◴	0.3	100	○
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.1	89	
7.3	Online creativity	3.1	103	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.3	70	●
7.3.2	Country-code TLDs/th pop. 15–69	0.8	89	
7.3.3	Wikipedia edits/pop. 15–69	691.2	88	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Niger

Key indicators

Population (millions)	18.5
GDP (US$ billions)	8.0
GDP per capita, PPP$	869.6
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**21.2**	**134**	
Innovation Output Sub-Index		9.6	139	○
Innovation Input Sub-Index		32.9	117	
Innovation Efficiency Ratio		0.3	139	○
Global Innovation Index 2014 (out of 143)		24.3	131	
1	**Institutions**	**45.1**	**119**	
1.1	Political environment	27.2	126	
1.1.1	Political stability*	32.1	129	
1.1.2	Government effectiveness*	22.3	113	
1.2	Regulatory environment	58.9	90	
1.2.1	Regulatory quality*	31.6	110	
1.2.2	Rule of law*	27.8	108	
1.2.3	Cost of redundancy dismissal, salary weeks	14.0	58	●
1.3	Business environment	49.2	135	
1.3.1	Ease of starting a business*	54.4	137	○
1.3.2	Ease of resolving insolvency*	36.0	112	
1.3.3	Ease of paying taxes*	57.1	119	
2	**Human capital & research**	**11.7**	**135**	
2.1	Education	27.3	124	
2.1.1	Expenditure on education, % GDP	4.4	73	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	46.7	4	●
2.1.3	School life expectancy, years	5.4	132	○
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	34.7	115	
2.2	Tertiary education	7.8	127	
2.2.1	Tertiary enrolment, % gross	1.8	132	○
2.2.2	Graduates in science & engineering, %◴	4.3	100	○
2.2.3	Tertiary inbound mobility, %	5.4	33	●
2.3	Research & development (R&D)	0.0	127	
2.3.1	Researchers, FTE/mn pop.◴	7.7	104	○
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**32.7**	**91**	
3.1	Information & communication technologies (ICTs)	14.1	136	
3.1.1	ICT access*	19.5	133	
3.1.2	ICT use*	0.9	134	○
3.1.3	Government's online service*	12.6	133	
3.1.4	E-participation*	23.5	115	
3.2	General infrastructure	59.2	8	●
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	11.9	117	
3.2.3	Gross capital formation, % GDP	46.4	5	●
3.3	Ecological sustainability	24.8	120	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	36.3	119	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	111	
4	**Market sophistication**	**40.4**	**111**	
4.1	Credit	12.8	127	
4.1.1	Ease of getting credit*	30.0	113	
4.1.2	Domestic credit to private sector, % GDP	14.2	131	
4.1.3	Microfinance gross loans, % GDP	0.4	45	●
4.2	Investment	42.5	45	
4.2.1	Ease of protecting investors*	42.5	120	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	66.0	112	
4.3.1	Applied tariff rate, weighted mean, %	9.7	118	
4.3.2	Intensity of local competition†	n/a	n/a	
5	**Business sophistication**	**34.4**	**70**	
5.1	Knowledge workers	37.9	69	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	32.1	57	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	12.9	136	○
5.2.1	University/industry research collaboration†	n/a	n/a	
5.2.2	State of cluster development†	n/a	n/a	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.1	45	●
5.3	Knowledge absorption	52.5	10	●
5.3.1	Royalty & license fees payments, % total trade◴	0.1	99	
5.3.2	High-tech imports less re-imports, % total trade	6.9	66	●
5.3.3	Comm., computer & info. services imp., % total trade◴	7.8	1	●
5.3.4	FDI net inflows, % GDP	8.6	14	●
6	**Knowledge & technology outputs**	**18.4**	**111**	
6.1	Knowledge creation	4.8	106	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP◴	0.1	71	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	6.6	87	
6.1.5	Citable documents H index	51.0	114	
6.2	Knowledge impact	34.0	89	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.4	39	●
6.2.2	New businesses/th pop. 15–64◴	0.0	106	○
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.7	121	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	16.3	126	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	113	○
6.3.2	High-tech exports less re-exports, % total trade	0.1	96	
6.3.3	Comm., computer & info. services exp., % total trade◴	0.7	88	
6.3.4	FDI net outflows, % GDP◴	0.0	102	
7	**Creative outputs**	**0.8**	**140**	○
7.1	Intangible assets	n/a	n/a	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	n/a	n/a	
7.1.4	ICTs & organizational model creation†	n/a	n/a	
7.2	Creative goods & services	1.1	131	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69◴	0.7	84	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade◴	0.0	123	
7.3	Online creativity	0.4	119	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.3	101	
7.3.2	Country-code TLDs/th pop. 15–69	0.0	137	○
7.3.3	Wikipedia edits/pop. 15–69	5.3	141	○
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Nigeria

Key indicators

Population (millions)	178.5
GDP (US$ billions)	573.7
GDP per capita, PPP$	2,997.4
Income group	Lower-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**23.7**	**128**	
Innovation Output Sub-Index		21.1	109	
Innovation Input Sub-Index		26.3	135	
Innovation Efficiency Ratio		0.8	28	●
Global Innovation Index 2014 (out of 143)		27.8	110	
1	**Institutions**	**39.2**	**133**	
1.1	Political environment	13.4	138	○
1.1.1	Political stability*	12.7	138	○
1.1.2	Government effectiveness*	14.1	129	
1.2	Regulatory environment	54.1	104	
1.2.1	Regulatory quality*	29.0	117	
1.2.2	Rule of law*	16.8	131	
1.2.3	Cost of redundancy dismissal, salary weeks	15.4	67	●
1.3	Business environment	50.0	132	
1.3.1	Ease of starting a business*	77.1	106	
1.3.2	Ease of resolving insolvency*	33.8	114	
1.3.3	Ease of paying taxes*	39.2	135	
2	**Human capital & research**	**11.5**	**137**	○
2.1	Education	24.5	128	
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years◴	9.0	121	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	33.1	112	
2.2	Tertiary education	8.3	124	
2.2.1	Tertiary enrolment, % gross◴	10.4	109	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	1.8	106	
2.3.1	Researchers, FTE/mn pop.◴	38.6	95	
2.3.2	Gross expenditure on R&D, % GDP◴	0.2	87	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**22.9**	**124**	
3.1	Information & communication technologies (ICTs)	26.3	111	
3.1.1	ICT access*	25.3	125	
3.1.2	ICT use*	16.0	100	
3.1.3	Government's online service*	30.7	101	
3.1.4	E-participation*	33.3	92	
3.2	General infrastructure	15.9	128	
3.2.1	Electricity output, kWh/cap	170.0	117	
3.2.2	Logistics performance*	33.0	72	
3.2.3	Gross capital formation, % GDP	15.0	123	
3.3	Ecological sustainability	26.5	115	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.1	89	
3.3.2	Environmental performance*	39.2	111	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.0	133	○
4	**Market sophistication**	**37.6**	**122**	
4.1	Credit	21.2	107	
4.1.1	Ease of getting credit*	60.0	48	●
4.1.2	Domestic credit to private sector, % GDP	12.6	132	
4.1.3	Microfinance gross loans, % GDP	0.1	71	
4.2	Investment	24.7	128	
4.2.1	Ease of protecting investors*	57.5	60	●
4.2.2	Market capitalization, % GDP	12.2	83	
4.2.3	Total value of stocks traded, % GDP	0.9	67	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	70	
4.3	Trade & competition	67.1	105	
4.3.1	Applied tariff rate, weighted mean, %◴	10.6	125	
4.3.2	Intensity of local competition†	71.3	48	●
5	**Business sophistication**	**20.3**	**137**	○
5.1	Knowledge workers	19.6	124	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	25.7	73	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %◴	0.2	89	○
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	17.8	129	
5.2.1	University/industry research collaboration†	29.2	119	
5.2.2	State of cluster development†	46.2	69	●
5.2.3	GERD financed by abroad, %◴	1.0	88	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	90	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	102	
5.3	Knowledge absorption	23.4	123	
5.3.1	Royalty & license fees payments, % total trade	0.3	75	
5.3.2	High-tech imports less re-imports, % total trade	2.9	124	○
5.3.3	Comm., computer & info. services imp., % total trade	1.1	57	●
5.3.4	FDI net inflows, % GDP	1.1	112	
6	**Knowledge & technology outputs**	**19.8**	**105**	
6.1	Knowledge creation	3.2	124	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.1	107	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	100	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.1	124	
6.1.5	Citable documents H index	103.0	69	●
6.2	Knowledge impact	31.2	99	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.5	22	●
6.2.2	New businesses/th pop. 15–64	0.9	71	
6.2.3	Computer software spending, % GDP	0.1	74	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.1	140	○
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	25.0	88	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.1	108	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP◴	0.3	74	
7	**Creative outputs**	**22.5**	**111**	
7.1	Intangible assets	38.0	100	
7.1.1	Domestic res trademark app./bn PPP$ GDP	19.9	83	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	55.8	69	●
7.1.4	ICTs & organizational model creation†	48.2	85	
7.2	Creative goods & services	13.8	85	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69◴	11.2	14	●
7.2.3	Global ent. & media output/th pop. 15–69	0.3	56	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.2	78	
7.3	Online creativity	0.3	125	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.6	113	
7.3.2	Country-code TLDs/th pop. 15–69	0.1	116	
7.3.3	Wikipedia edits/pop. 15–69	36.2	128	
7.3.4	Video uploads on YouTube/pop. 15–69	0.0	74	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Norway

Key indicators

Population (millions)	5.1
GDP (US$ billions)	500.2
GDP per capita, PPP$	56,222.6
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**53.8**	**20**	
Innovation Output Sub-Index		45.4	25	
Innovation Input Sub-Index		62.2	16	
Innovation Efficiency Ratio		0.7	63	
Global Innovation Index 2014 (out of 143)		55.6	14	
1	**Institutions**	**94.0**	**3**	●
1.1	Political environment	94.4	3	●
1.1.1	Political stability*	97.1	7	●
1.1.2	Government effectiveness*	91.8	5	●
1.2	Regulatory environment	97.3	4	●
1.2.1	Regulatory quality*	91.9	12	
1.2.2	Rule of law*	100.0	1	●
1.2.3	Cost of redundancy dismissal, salary weeks	8.7	24	
1.3	Business environment	90.2	5	●
1.3.1	Ease of starting a business*	94.0	21	
1.3.2	Ease of resolving insolvency*	85.6	7	●
1.3.3	Ease of paying taxes*	90.8	14	
2	**Human capital & research**	**49.9**	**21**	
2.1	Education	54.2	34	
2.1.1	Expenditure on education, % GDP	6.6	21	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	26.2	32	
2.1.3	School life expectancy, years	17.5	9	
2.1.4	PISA scales in reading, maths, & science	495.9	23	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	40.1	45	
2.2.1	Tertiary enrolment, % gross	74.1	19	
2.2.2	Graduates in science & engineering, %	17.0	66	○
2.2.3	Tertiary inbound mobility, %	7.7	23	
2.3	Research & development (R&D)	55.3	18	
2.3.1	Researchers, FTE/mn pop.◴	5575.0	8	
2.3.2	Gross expenditure on R&D, % GDP	1.7	22	
2.3.3	QS university ranking, average score top 3*	58.9	19	
3	**Infrastructure**	**64.8**	**3**	●
3.1	Information & communication technologies (ICTs)	77.1	16	
3.1.1	ICT access*	83.6	15	
3.1.2	ICT use*	80.7	5	●
3.1.3	Government's online service*	75.6	21	
3.1.4	E-participation*	68.6	30	
3.2	General infrastructure	68.1	1	●
3.2.1	Electricity output, kWh/cap	26317.9	1	●
3.2.2	Logistics performance*	91.7	7	●
3.2.3	Gross capital formation, % GDP	26.8	38	
3.3	Ecological sustainability	49.1	31	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.3	59	○
3.3.2	Environmental performance*	78.0	10	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	3.1	32	
4	**Market sophistication**	**56.5**	**29**	
4.1	Credit	41.3	43	
4.1.1	Ease of getting credit*	55.0	56	
4.1.2	Domestic credit to private sector, % GDP◴	86.2	37	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	42.5	47	
4.2.1	Ease of protecting investors*	70.0	12	
4.2.2	Market capitalization, % GDP	50.6	38	
4.2.3	Total value of stocks traded, % GDP	26.6	27	
4.2.4	Venture capital deals/tr PPP$ GDP	0.2	17	
4.3	Trade & competition	85.7	23	
4.3.1	Applied tariff rate, weighted mean, %	0.3	2	●
4.3.2	Intensity of local competition†	72.3	47	
5	**Business sophistication**	**45.8**	**27**	
5.1	Knowledge workers	62.1	17	
5.1.1	Knowledge-intensive employment, %	46.8	7	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	0.9	23	
5.1.4	GERD financed by business, %◴	44.2	31	
5.1.5	Females employed w/advanced degrees, % total	23.2	11	
5.2	Innovation linkages	42.9	29	
5.2.1	University/industry research collaboration†	67.0	14	
5.2.2	State of cluster development†	67.7	13	
5.2.3	GERD financed by abroad, %◴	7.8	50	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	25	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.5	23	
5.3	Knowledge absorption	32.4	71	○
5.3.1	Royalty & license fees payments, % total trade	0.4	62	○
5.3.2	High-tech imports less re-imports, % total trade	5.9	85	○
5.3.3	Comm., computer & info. services imp., % total trade	1.7	31	
5.3.4	FDI net inflows, % GDP	-0.5	131	○
6	**Knowledge & technology outputs**	**39.2**	**27**	
6.1	Knowledge creation	34.5	27	
6.1.1	Domestic resident patent app./bn PPP$ GDP	3.3	29	
6.1.2	PCT resident patent app./bn PPP$ GDP	2.0	23	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	33.6	24	
6.1.5	Citable documents H index	362.0	20	
6.2	Knowledge impact	49.1	22	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.4	63	○
6.2.2	New businesses/th pop. 15–64	7.8	16	
6.2.3	Computer software spending, % GDP	0.6	17	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	6.3	56	
6.2.5	High- & medium-high-tech manufactures, %◴	37.9	24	
6.3	Knowledge diffusion	33.9	43	
6.3.1	Royalty & license fees receipts, % total trade	0.3	30	
6.3.2	High-tech exports less re-exports, % total trade	3.2	41	
6.3.3	Comm., computer & info. services exp., % total trade	1.5	61	○
6.3.4	FDI net outflows, % GDP	2.3	30	
7	**Creative outputs**	**51.7**	**16**	
7.1	Intangible assets	50.5	45	
7.1.1	Domestic res trademark app./bn PPP$ GDP	30.0	71	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.9	32	○
7.1.3	ICTs & business model creation†	74.9	11	
7.1.4	ICTs & organizational model creation†	75.1	3	●
7.2	Creative goods & services	35.5	26	
7.2.1	Cultural & creative services exports, % total trade	0.6	34	
7.2.2	National feature films/mn pop. 15–69	8.1	23	
7.2.3	Global ent. & media output/th pop. 15–69	100.0	1	●
7.2.4	Printing & publishing output manufactures, %◴	1.8	33	
7.2.5	Creative goods exports, % total trade	0.5	59	
7.3	Online creativity	70.1	10	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	62.6	15	
7.3.2	Country-code TLDs/th pop. 15–69	76.5	13	
7.3.3	Wikipedia edits/pop. 15–69	7232.9	15	
7.3.4	Video uploads on YouTube/pop. 15–69	88.0	18	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Oman

Key indicators

Population (millions)	3.9
GDP (US$ billions)	77.8
GDP per capita, PPP$	30,325.1
Income group	High income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**35.0**	**69**	
Innovation Output Sub-Index		28.2	68	
Innovation Input Sub-Index		41.8	68	
Innovation Efficiency Ratio		0.7	86	
Global Innovation Index 2014 (out of 143)		33.9	75	
1	**Institutions**	**70.9**	**44**	
1.1	Political environment	61.5	50	
1.1.1	Political stability*	75.9	47	
1.1.2	Government effectiveness*	47.1	58	
1.2	Regulatory environment	80.7	29	●
1.2.1	Regulatory quality*	60.4	50	
1.2.2	Rule of law*	62.4	41	●
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	70.4	62	
1.3.1	Ease of starting a business*	79.3	100	
1.3.2	Ease of resolving insolvency*	39.0	103	
1.3.3	Ease of paying taxes*	92.9	10	●
2	**Human capital & research**	**29.1**	**68**	
2.1	Education	33.6	105	
2.1.1	Expenditure on education, % GDP◴	4.2	80	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	15.9	79	
2.1.3	School life expectancy, years◴	13.6	66	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	49.4	20	●
2.2.1	Tertiary enrolment, % gross◴	28.1	81	
2.2.2	Graduates in science & engineering, %◴	38.9	4	●
2.2.3	Tertiary inbound mobility, %	2.6	58	
2.3	Research & development (R&D)	4.3	85	
2.3.1	Researchers, FTE/mn pop.◴	159.9	76	
2.3.2	Gross expenditure on R&D, % GDP◴	0.1	102	○
2.3.3	QS university ranking, average score top 3*	8.3	63	
3	**Infrastructure**	**45.4**	**48**	
3.1	Information & communication technologies (ICTs)	65.4	36	●
3.1.1	ICT access*	71.2	42	●
3.1.2	ICT use*	46.5	44	
3.1.3	Government's online service*	73.2	26	●
3.1.4	E-participation*	70.6	24	●
3.2	General infrastructure	42.3	35	●
3.2.1	Electricity output, kWh/cap	7558.0	26	●
3.2.2	Logistics performance*	42.5	57	
3.2.3	Gross capital formation, % GDP	28.4	30	●
3.3	Ecological sustainability	28.5	103	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	5.0	98	
3.3.2	Environmental performance*	47.8	88	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.5	81	
4	**Market sophistication**	**40.7**	**108**	
4.1	Credit	23.8	94	
4.1.1	Ease of getting credit*	35.0	102	
4.1.2	Domestic credit to private sector, % GDP	42.2	80	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	22.2	134	○
4.2.1	Ease of protecting investors*	45.8	107	
4.2.2	Market capitalization, % GDP	25.9	62	
4.2.3	Total value of stocks traded, % GDP	3.4	54	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	66	○
4.3	Trade & competition	76.2	71	
4.3.1	Applied tariff rate, weighted mean, %	4.1	65	
4.3.2	Intensity of local competition†	66.6	70	
5	**Business sophistication**	**23.0**	**128**	○
5.1	Knowledge workers	3.4	139	○
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	0.0	76	○
5.1.4	GERD financed by business, %◴	4.6	75	○
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	40.9	39	●
5.2.1	University/industry research collaboration†	43.6	67	
5.2.2	State of cluster development†	49.8	51	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	13	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	74	
5.3	Knowledge absorption	24.7	116	
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	2.9	125	○
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	2.0	83	
6	**Knowledge & technology outputs**	**23.9**	**84**	
6.1	Knowledge creation	4.1	112	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP◴	0.0	92	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	3.8	110	
6.1.5	Citable documents H index	74.0	93	
6.2	Knowledge impact	35.4	82	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.6	36	
6.2.2	New businesses/th pop. 15–64◴	1.7	49	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.0	80	
6.2.5	High- & medium-high-tech manufactures, %◴	14.9	65	
6.3	Knowledge diffusion	32.0	51	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.3	88	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	1.7	38	
7	**Creative outputs**	**32.5**	**70**	
7.1	Intangible assets	55.4	27	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	58.7	58	
7.1.4	ICTs & organizational model creation†	52.1	70	
7.2	Creative goods & services	3.0	119	○
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69◴	0.0	104	○
7.2.3	Global ent. & media output/th pop. 15–69	7.8	40	
7.2.4	Printing & publishing output manufactures, %◴	0.4	92	○
7.2.5	Creative goods exports, % total trade	0.0	119	○
7.3	Online creativity	16.0	72	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.5	80	
7.3.2	Country-code TLDs/th pop. 15–69	0.2	111	
7.3.3	Wikipedia edits/pop. 15–69	637.4	89	
7.3.4	Video uploads on YouTube/pop. 15–69	56.7	64	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Pakistan

Key indicators

Population (millions)	185.1
GDP (US$ billions)	250.1
GDP per capita, PPP$	3,231.2
Income group	Lower-middle income
Region	Central and Southern Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**23.1**	**131**	○
Innovation Output Sub-Index		19.9	117	
Innovation Input Sub-Index		26.2	136	○
Innovation Efficiency Ratio		0.8	47	●
Global Innovation Index 2014 (out of 143)		24.0	134	
1	**Institutions**	**37.1**	**134**	○
1.1	Political environment	9.9	139	○
1.1.1	Political stability*	0.0	141	○
1.1.2	Government effectiveness*	19.8	117	
1.2	Regulatory environment	44.3	122	
1.2.1	Regulatory quality*	28.8	118	
1.2.2	Rule of law*	24.2	118	
1.2.3	Cost of redundancy dismissal, salary weeks	27.2	116	
1.3	Business environment	57.2	111	
1.3.1	Ease of starting a business*	80.9	95	
1.3.2	Ease of resolving insolvency*	46.2	73	
1.3.3	Ease of paying taxes*	44.5	130	○
2	**Human capital & research**	**12.8**	**134**	○
2.1	Education	20.4	136	○
2.1.1	Expenditure on education, % GDP	2.5	118	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	10.4	99	
2.1.3	School life expectancy, years	7.8	128	○
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	21.0	87	
2.2	Tertiary education	7.8	128	○
2.2.1	Tertiary enrolment, % gross	9.8	113	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	10.2	68	●
2.3.1	Researchers, FTE/mn pop.	166.0	70	
2.3.2	Gross expenditure on R&D, % GDP	0.3	79	
2.3.3	QS university ranking, average score top 3*	22.1	51	●
3	**Infrastructure**	**23.1**	**123**	
3.1	Information & communication technologies (ICTs)	25.0	114	
3.1.1	ICT access*	30.3	116	
3.1.2	ICT use*	4.2	125	
3.1.3	Government's online service*	32.3	95	
3.1.4	E-participation*	33.3	92	
3.2	General infrastructure	15.5	131	○
3.2.1	Electricity output, kWh/cap	536.5	106	
3.2.2	Logistics performance*	33.9	69	
3.2.3	Gross capital formation, % GDP	14.0	130	○
3.3	Ecological sustainability	28.8	99	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	8.1	50	●
3.3.2	Environmental performance*	34.6	123	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	99	
4	**Market sophistication**	**35.8**	**129**	
4.1	Credit	11.9	129	
4.1.1	Ease of getting credit*	30.0	113	
4.1.2	Domestic credit to private sector, % GDP	16.0	125	
4.1.3	Microfinance gross loans, % GDP	0.1	61	
4.2	Investment	29.9	97	
4.2.1	Ease of protecting investors*	66.7	21	●
4.2.2	Market capitalization, % GDP	19.5	71	
4.2.3	Total value of stocks traded, % GDP	5.3	48	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	73	○
4.3	Trade & competition	65.5	116	
4.3.1	Applied tariff rate, weighted mean, %	9.5	117	
4.3.2	Intensity of local competition†	64.5	81	
5	**Business sophistication**	**22.5**	**131**	○
5.1	Knowledge workers	18.2	125	
5.1.1	Knowledge-intensive employment, %	19.5	74	
5.1.2	Firms offering formal training, % firms	6.7	107	○
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	20.2	123	
5.2.1	University/industry research collaboration†	36.9	95	
5.2.2	State of cluster development†	49.0	55	●
5.2.3	GERD financed by abroad, %	1.3	86	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	79	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	104	
5.3	Knowledge absorption	28.9	97	
5.3.1	Royalty & license fees payments, % total trade	0.3	71	
5.3.2	High-tech imports less re-imports, % total trade	7.3	60	●
5.3.3	Comm., computer & info. services imp., % total trade	1.0	60	
5.3.4	FDI net inflows, % GDP	0.6	121	
6	**Knowledge & technology outputs**	**20.2**	**101**	
6.1	Knowledge creation	8.4	82	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.2	91	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	7.8	75	
6.1.5	Citable documents H index	130.0	55	●
6.2	Knowledge impact	29.0	107	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.9	75	
6.2.2	New businesses/th pop. 15–64	0.0	104	○
6.2.3	Computer software spending, % GDP	0.3	51	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	2.8	86	
6.2.5	High- & medium-high-tech manufactures, %	23.7	49	●
6.3	Knowledge diffusion	23.1	100	
6.3.1	Royalty & license fees receipts, % total trade	0.0	88	
6.3.2	High-tech exports less re-exports, % total trade	0.9	67	
6.3.3	Comm., computer & info. services exp., % total trade	2.3	34	●
6.3.4	FDI net outflows, % GDP	0.1	90	
7	**Creative outputs**	**19.6**	**121**	
7.1	Intangible assets	34.3	118	
7.1.1	Domestic res trademark app./bn PPP$ GDP	18.8	84	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	50.3	91	
7.1.4	ICTs & organizational model creation†	43.3	101	
7.2	Creative goods & services	9.0	100	
7.2.1	Cultural & creative services exports, % total trade	0.0	77	
7.2.2	National feature films/mn pop. 15–69	0.3	102	○
7.2.3	Global ent. & media output/th pop. 15–69	0.0	59	○
7.2.4	Printing & publishing output manufactures, %	0.3	96	○
7.2.5	Creative goods exports, % total trade	1.1	37	●
7.3	Online creativity	0.9	114	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.7	111	
7.3.2	Country-code TLDs/th pop. 15–69	0.2	115	
7.3.3	Wikipedia edits/pop. 15–69	244.8	104	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Panama

Key indicators

Population (millions)	3.9
GDP (US$ billions)	43.8
GDP per capita, PPP$	17,809.9
Income group	Upper-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**36.8**	**62**	
Innovation Output Sub-Index		32.2	53	
Innovation Input Sub-Index		41.4	72	
Innovation Efficiency Ratio		0.8	36	
Global Innovation Index 2014 (out of 143)		38.3	52	
1	**Institutions**	**59.4**	**73**	
1.1	Political environment	55.5	57	
1.1.1	Political stability*	60.9	75	
1.1.2	Government effectiveness*	50.1	53	
1.2	Regulatory environment	64.7	78	
1.2.1	Regulatory quality*	57.7	58	
1.2.2	Rule of law*	41.3	73	
1.2.3	Cost of redundancy dismissal, salary weeks	18.1	83	
1.3	Business environment	58.1	110	
1.3.1	Ease of starting a business*	91.9	33	
1.3.2	Ease of resolving insolvency*	33.7	115	
1.3.3	Ease of paying taxes*	48.6	127	○
2	**Human capital & research**	**26.2**	**83**	
2.1	Education	35.4	98	
2.1.1	Expenditure on education, % GDP	3.3	102	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	9.7	103	○
2.1.3	School life expectancy, years	13.3	75	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	14.2	55	
2.2	Tertiary education	41.3	40	
2.2.1	Tertiary enrolment, % gross	43.5	61	
2.2.2	Graduates in science & engineering, %[d]	22.0	38	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	1.8	103	
2.3.1	Researchers, FTE/mn pop.[d]	117.1	81	
2.3.2	Gross expenditure on R&D, % GDP[d]	0.2	93	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**43.1**	**55**	
3.1	Information & communication technologies (ICTs)	42.1	80	
3.1.1	ICT access*	55.3	71	
3.1.2	ICT use*	27.0	77	
3.1.3	Government's online service*	37.0	87	
3.1.4	E-participation*	49.0	64	
3.2	General infrastructure	39.5	41	
3.2.1	Electricity output, kWh/cap	2264.7	73	
3.2.2	Logistics performance*	52.7	43	
3.2.3	Gross capital formation, % GDP	29.8	22	●
3.3	Ecological sustainability	47.7	36	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	13.5	7	●
3.3.2	Environmental performance*	56.8	54	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	105	
4	**Market sophistication**	**43.8**	**92**	
4.1	Credit	34.0	56	
4.1.1	Ease of getting credit*	75.0	16	●
4.1.2	Domestic credit to private sector, % GDP	70.7	46	
4.1.3	Microfinance gross loans, % GDP	0.4	47	
4.2	Investment	26.7	109	
4.2.1	Ease of protecting investors*	55.8	70	
4.2.2	Market capitalization, % GDP	33.0	54	
4.2.3	Total value of stocks traded, % GDP	0.3	85	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	57	
4.3	Trade & competition	70.8	92	
4.3.1	Applied tariff rate, weighted mean, %[d]	7.6	105	
4.3.2	Intensity of local competition†	68.4	65	
5	**Business sophistication**	**34.5**	**69**	
5.1	Knowledge workers	25.0	104	
5.1.1	Knowledge-intensive employment, %[d]	24.4	59	
5.1.2	Firms offering formal training, % firms[d]	11.0	104	○
5.1.3	GERD performed by business, % of GDP[d]	0.0	84	○
5.1.4	GERD financed by business, %[d]	18.9	63	
5.1.5	Females employed w/advanced degrees, % total[d]	16.6	33	
5.2	Innovation linkages	32.2	63	
5.2.1	University/industry research collaboration†	50.6	39	
5.2.2	State of cluster development†	50.3	49	
5.2.3	GERD financed by abroad, %[d]	20.7	19	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	55	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.1	47	
5.3	Knowledge absorption	46.1	23	●
5.3.1	Royalty & license fees payments, % total trade	0.3	76	
5.3.2	High-tech imports less re-imports, % total trade[d]	20.2	7	●
5.3.3	Comm., computer & info. services imp., % total trade	0.3	114	○
5.3.4	FDI net inflows, % GDP	11.8	9	●
6	**Knowledge & technology outputs**	**24.7**	**79**	
6.1	Knowledge creation	3.6	121	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.1	95	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.2	48	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.0	60	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	4.6	101	
6.1.5	Citable documents H index	119.0	60	
6.2	Knowledge impact	30.4	101	
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	14.1	5	●
6.2.3	Computer software spending, % GDP	0.2	62	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	2.0	91	
6.2.5	High- & medium-high-tech manufactures, %[d]	5.2	89	○
6.3	Knowledge diffusion	40.0	35	
6.3.1	Royalty & license fees receipts, % total trade	0.0	72	
6.3.2	High-tech exports less re-exports, % total trade[d]	18.4	6	●
6.3.3	Comm., computer & info. services exp., % total trade	1.3	68	
6.3.4	FDI net outflows, % GDP	1.6	41	
7	**Creative outputs**	**39.7**	**42**	
7.1	Intangible assets	53.0	36	
7.1.1	Domestic res trademark app./bn PPP$ GDP	63.0	35	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	64.5	33	
7.1.4	ICTs & organizational model creation†	59.8	41	
7.2	Creative goods & services	30.1	37	
7.2.1	Cultural & creative services exports, % total trade	0.1	57	
7.2.2	National feature films/mn pop. 15–69[d]	0.4	97	○
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %[d]	5.3	6	●
7.2.5	Creative goods exports, % total trade	0.0	124	○
7.3	Online creativity	22.7	61	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	56.0	16	●
7.3.2	Country-code TLDs/th pop. 15–69	1.6	79	
7.3.3	Wikipedia edits/pop. 15–69	1416.5	69	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[d] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Paraguay

Key indicators

Population (millions)	6.9
GDP (US$ billions)	29.7
GDP per capita, PPP$	7,134.4
Income group	Lower-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**30.7**	**88**	
Innovation Output Sub-Index		26.2	83	
Innovation Input Sub-Index		35.2	103	
Innovation Efficiency Ratio		0.7	54	●
Global Innovation Index 2014 (out of 143)		31.6	89	
1	**Institutions**	**47.9**	**112**	
1.1	Political environment	32.6	116	
1.1.1	Political stability*	47.6	103	
1.1.2	Government effectiveness*	17.6	122	
1.2	Regulatory environment	48.4	117	
1.2.1	Regulatory quality*	39.3	93	
1.2.2	Rule of law*	25.7	113	
1.2.3	Cost of redundancy dismissal, salary weeks	26.1	113	
1.3	Business environment	62.6	94	
1.3.1	Ease of starting a business*	77.5	103	
1.3.2	Ease of resolving insolvency*	40.9	98	
1.3.3	Ease of paying taxes*	69.5	87	
2	**Human capital & research**	**23.9**	**90**	
2.1	Education	41.5	81	
2.1.1	Expenditure on education, % GDP	5.0	60	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	17.6	72	
2.1.3	School life expectancy, years◴	11.9	93	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	8.9	16	●
2.2	Tertiary education	29.1	76	
2.2.1	Tertiary enrolment, % gross◴	34.5	71	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	1.2	113	
2.3.1	Researchers, FTE/mn pop.◴	161.6	73	
2.3.2	Gross expenditure on R&D, % GDP◴	0.1	108	○
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**28.8**	**103**	
3.1	Information & communication technologies (ICTs)	27.1	108	
3.1.1	ICT access*	44.9	90	
3.1.2	ICT use*	15.0	102	
3.1.3	Government's online service*	22.8	118	
3.1.4	E-participation*	25.5	110	
3.2	General infrastructure	27.8	82	
3.2.1	Electricity output, kWh/cap	9003.6	16	●
3.2.2	Logistics performance*	31.6	75	
3.2.3	Gross capital formation, % GDP	15.7	119	
3.3	Ecological sustainability	31.5	91	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	8.6	45	●
3.3.2	Environmental performance*	39.3	110	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	108	
4	**Market sophistication**	**45.5**	**80**	
4.1	Credit	40.1	44	●
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	45.8	73	
4.1.3	Microfinance gross loans, % GDP	4.7	11	●
4.2	Investment	19.8	138	○
4.2.1	Ease of protecting investors*	38.3	132	○
4.2.2	Market capitalization, % GDP	3.9	105	○
4.2.3	Total value of stocks traded, % GDP	0.2	90	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	76.5	67	
4.3.1	Applied tariff rate, weighted mean, %	4.3	72	
4.3.2	Intensity of local competition†	67.9	66	
5	**Business sophistication**	**29.7**	**97**	
5.1	Knowledge workers	33.7	83	
5.1.1	Knowledge-intensive employment, %	18.9	78	
5.1.2	Firms offering formal training, % firms◴	54.9	19	●
5.1.3	GERD performed by business, % of GDP◴	0.0	88	○
5.1.4	GERD financed by business, %◴	0.8	85	○
5.1.5	Females employed w/advanced degrees, % total	12.4	51	
5.2	Innovation linkages	23.2	109	
5.2.1	University/industry research collaboration†	28.3	121	
5.2.2	State of cluster development†	34.3	116	
5.2.3	GERD financed by abroad, %◴	7.7	51	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	32.3	73	
5.3.1	Royalty & license fees payments, % total trade	0.3	77	
5.3.2	High-tech imports less re-imports, % total trade	16.0	11	●
5.3.3	Comm., computer & info. services imp., % total trade	0.0	123	○
5.3.4	FDI net inflows, % GDP	1.2	109	
6	**Knowledge & technology outputs**	**16.2**	**121**	
6.1	Knowledge creation	2.6	131	○
6.1.1	Domestic resident patent app./bn PPP$ GDP◴	0.4	79	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	1.0	133	○
6.1.5	Citable documents H index	48.0	118	
6.2	Knowledge impact	15.7	123	
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	4.7	66	●
6.2.5	High- & medium-high-tech manufactures, %◴	15.1	64	
6.3	Knowledge diffusion	30.3	56	●
6.3.1	Royalty & license fees receipts, % total trade◴	3.1	6	●
6.3.2	High-tech exports less re-exports, % total trade	0.5	76	
6.3.3	Comm., computer & info. services exp., % total trade	0.1	117	○
6.3.4	FDI net outflows, % GDP	-0.1	112	
7	**Creative outputs**	**36.3**	**51**	●
7.1	Intangible assets	66.7	4	●
7.1.1	Domestic res trademark app./bn PPP$ GDP◴	296.3	1	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	52.1	82	
7.1.4	ICTs & organizational model creation†	48.1	87	
7.2	Creative goods & services	8.3	103	
7.2.1	Cultural & creative services exports, % total trade	0.0	85	○
7.2.2	National feature films/mn pop. 15–69◴	1.3	70	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	1.4	52	
7.2.5	Creative goods exports, % total trade	0.0	113	
7.3	Online creativity	3.3	101	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.9	89	
7.3.2	Country-code TLDs/th pop. 15–69	1.4	82	
7.3.3	Wikipedia edits/pop. 15–69	872.4	82	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Peru

Key indicators

Population (millions)	30.8
GDP (US$ billions)	202.9
GDP per capita, PPP$	11,735.3
Income group	Upper-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**34.9**	**71**	
Innovation Output Sub-Index		26.2	82	
Innovation Input Sub-Index		43.5	60	
Innovation Efficiency Ratio		0.6	113	
Global Innovation Index 2014 (out of 143)		34.7	73	
1	**Institutions**	**60.4**	**69**	
1.1	Political environment	41.3	97	
1.1.1	Political stability*	45.1	111	
1.1.2	Government effectiveness*	37.5	80	
1.2	Regulatory environment	69.4	56	
1.2.1	Regulatory quality*	59.8	52	
1.2.2	Rule of law*	31.4	99	
1.2.3	Cost of redundancy dismissal, salary weeks	11.4	43	
1.3	Business environment	70.4	64	
1.3.1	Ease of starting a business*	85.1	74	
1.3.2	Ease of resolving insolvency*	46.6	71	
1.3.3	Ease of paying taxes*	79.4	48	
2	**Human capital & research**	**26.8**	**77**	
2.1	Education	32.3	107	
2.1.1	Expenditure on education, % GDP	3.3	104	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	10.4	98	○
2.1.3	School life expectancy, years◴	13.1	79	
2.1.4	PISA scales in reading, maths, & science	375.1	61	○
2.1.5	Pupil-teacher ratio, secondary	15.5	67	
2.2	Tertiary education	34.4	61	
2.2.1	Tertiary enrolment, % gross◴	40.6	65	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	13.8	60	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP◴	0.2	95	○
2.3.3	QS university ranking, average score top 3*	24.1	50	
3	**Infrastructure**	**42.0**	**59**	
3.1	Information & communication technologies (ICTs)	49.0	62	
3.1.1	ICT access*	45.4	89	
3.1.2	ICT use*	16.9	95	
3.1.3	Government's online service*	63.0	41	
3.1.4	E-participation*	70.6	24	●
3.2	General infrastructure	31.6	66	
3.2.1	Electricity output, kWh/cap	1330.7	90	
3.2.2	Logistics performance*	34.7	68	
3.2.3	Gross capital formation, % GDP	27.8	32	●
3.3	Ecological sustainability	45.5	43	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	14.3	4	●
3.3.2	Environmental performance*	45.1	94	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.0	65	
4	**Market sophistication**	**56.6**	**28**	●
4.1	Credit	49.4	26	●
4.1.1	Ease of getting credit*	80.0	11	●
4.1.2	Domestic credit to private sector, % GDP	31.4	96	
4.1.3	Microfinance gross loans, % GDP	5.0	9	●
4.2	Investment	39.1	55	
4.2.1	Ease of protecting investors*	61.7	38	●
4.2.2	Market capitalization, % GDP	50.3	39	
4.2.3	Total value of stocks traded, % GDP	2.6	58	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	81.4	44	
4.3.1	Applied tariff rate, weighted mean, %◴	1.5	40	
4.3.2	Intensity of local competition†	67.8	67	
5	**Business sophistication**	**31.6**	**85**	
5.1	Knowledge workers	40.1	63	
5.1.1	Knowledge-intensive employment, %	15.0	93	
5.1.2	Firms offering formal training, % firms◴	60.1	12	●
5.1.3	GERD performed by business, % of GDP◴	0.0	72	○
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	13.9	44	
5.2	Innovation linkages	22.5	113	○
5.2.1	University/industry research collaboration†	35.0	106	
5.2.2	State of cluster development†	37.7	105	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	86	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	101	○
5.3	Knowledge absorption	32.2	74	
5.3.1	Royalty & license fees payments, % total trade◴	0.5	57	
5.3.2	High-tech imports less re-imports, % total trade	8.8	51	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.8	69	
5.3.4	FDI net inflows, % GDP	5.0	34	●
6	**Knowledge & technology outputs**	**19.2**	**107**	
6.1	Knowledge creation	4.6	108	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.2	89	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	84	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.3	41	
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.4	122	○
6.1.5	Citable documents H index	126.0	56	
6.2	Knowledge impact	36.3	76	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.9	15	●
6.2.2	New businesses/th pop. 15–64	3.8	31	
6.2.3	Computer software spending, % GDP	0.3	57	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	2.9	83	
6.2.5	High- & medium-high-tech manufactures, %	9.2	79	
6.3	Knowledge diffusion	16.6	124	○
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	81	
6.3.2	High-tech exports less re-exports, % total trade	0.4	79	
6.3.3	Comm., computer & info. services exp., % total trade◴	0.4	102	○
6.3.4	FDI net outflows, % GDP	0.1	94	
7	**Creative outputs**	**33.3**	**64**	
7.1	Intangible assets	45.2	67	
7.1.1	Domestic res trademark app./bn PPP$ GDP◴	54.3	41	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	54.0	74	
7.1.4	ICTs & organizational model creation†	52.1	71	
7.2	Creative goods & services	18.9	70	
7.2.1	Cultural & creative services exports, % total trade	0.1	56	
7.2.2	National feature films/mn pop. 15–69	0.6	90	○
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	2.7	15	●
7.2.5	Creative goods exports, % total trade	0.3	67	
7.3	Online creativity	23.8	56	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	5.7	56	
7.3.2	Country-code TLDs/th pop. 15–69	1.7	78	
7.3.3	Wikipedia edits/pop. 15–69	1929.6	54	
7.3.4	Video uploads on YouTube/pop. 15–69	73.7	48	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Philippines

Key indicators

Population (millions)	100.1
GDP (US$ billions)	284.9
GDP per capita, PPP$	4,961.7
Income group	Lower-middle income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**31.1**	**83**	
Innovation Output Sub-Index		26.9	77	
Innovation Input Sub-Index		35.2	101	
Innovation Efficiency Ratio		0.8	44	●
Global Innovation Index 2014 (out of 143)		29.9	100	
1	**Institutions**	**51.8**	**102**	
1.1	Political environment	40.5	100	
1.1.1	Political stability*	38.0	116	
1.1.2	Government effectiveness*	43.0	65	
1.2	Regulatory environment	51.3	110	
1.2.1	Regulatory quality*	45.9	74	
1.2.2	Rule of law*	36.3	86	
1.2.3	Cost of redundancy dismissal, salary weeks	27.4	118	
1.3	Business environment	63.5	90	
1.3.1	Ease of starting a business*	67.2	128	○
1.3.2	Ease of resolving insolvency*	56.7	48	●
1.3.3	Ease of paying taxes*	66.5	101	
2	**Human capital & research**	**14.8**	**123**	
2.1	Education	21.3	132	○
2.1.1	Expenditure on education, % GDP◴	2.7	115	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	9.1	104	○
2.1.3	School life expectancy, years◴	11.3	102	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	34.8	116	○
2.2	Tertiary education	12.0	120	
2.2.1	Tertiary enrolment, % gross◴	28.2	80	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %◴	0.1	110	○
2.3	Research & development (R&D)	11.0	66	
2.3.1	Researchers, FTE/mn pop.◴	78.3	85	
2.3.2	Gross expenditure on R&D, % GDP◴	0.1	105	○
2.3.3	QS university ranking, average score top 3*	29.9	45	●
3	**Infrastructure**	**35.8**	**83**	
3.1	Information & communication technologies (ICTs)	42.7	79	
3.1.1	ICT access*	43.0	96	
3.1.2	ICT use*	22.8	87	
3.1.3	Government's online service*	48.0	66	
3.1.4	E-participation*	56.9	51	
3.2	General infrastructure	23.6	105	
3.2.1	Electricity output, kWh/cap	754.0	98	
3.2.2	Logistics performance*	43.0	55	
3.2.3	Gross capital formation, % GDP	19.1	99	
3.3	Ecological sustainability	41.2	53	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	12.2	13	●
3.3.2	Environmental performance*	44.0	98	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.0	66	
4	**Market sophistication**	**42.1**	**101**	
4.1	Credit	17.6	120	
4.1.1	Ease of getting credit*	40.0	93	
4.1.2	Domestic credit to private sector, % GDP	35.8	89	
4.1.3	Microfinance gross loans, % GDP	0.2	58	
4.2	Investment	32.4	81	
4.2.1	Ease of protecting investors*	41.7	123	○
4.2.2	Market capitalization, % GDP	105.6	12	●
4.2.3	Total value of stocks traded, % GDP	13.9	32	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	50	
4.3	Trade & competition	76.3	69	
4.3.1	Applied tariff rate, weighted mean, %◴	4.8	79	
4.3.2	Intensity of local competition†	69.2	59	
5	**Business sophistication**	**31.7**	**81**	
5.1	Knowledge workers	39.6	67	
5.1.1	Knowledge-intensive employment, %	23.7	63	
5.1.2	Firms offering formal training, % firms◴	31.1	62	
5.1.3	GERD performed by business, % of GDP◴	0.1	68	
5.1.4	GERD financed by business, %◴	62.0	6	●
5.1.5	Females employed w/advanced degrees, % total◴	14.1	41	
5.2	Innovation linkages	25.4	97	
5.2.1	University/industry research collaboration†	46.6	53	
5.2.2	State of cluster development†	50.5	48	
5.2.3	GERD financed by abroad, %◴	4.1	70	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	46	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	77	
5.3	Knowledge absorption	30.2	91	
5.3.1	Royalty & license fees payments, % total trade	0.7	44	●
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade	0.7	75	
5.3.4	FDI net inflows, % GDP	1.4	100	
6	**Knowledge & technology outputs**	**28.9**	**53**	
6.1	Knowledge creation	9.1	77	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.3	82	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	79	
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.2	23	
6.1.4	Scientific & technical articles/bn PPP$ GDP	1.6	131	○
6.1.5	Citable documents H index	131.0	54	
6.2	Knowledge impact	36.0	80	
6.2.1	Growth rate of PPP$ GDP/worker, %	4.6	10	●
6.2.2	New businesses/th pop. 15–64	0.3	93	○
6.2.3	Computer software spending, % GDP	0.3	53	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.0	81	
6.2.5	High- & medium-high-tech manufactures, %◴	16.3	62	
6.3	Knowledge diffusion	41.7	31	●
6.3.1	Royalty & license fees receipts, % total trade	0.0	98	
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade	4.6	10	●
6.3.4	FDI net outflows, % GDP	1.4	45	
7	**Creative outputs**	**24.8**	**101**	
7.1	Intangible assets	38.5	96	
7.1.1	Domestic res trademark app./bn PPP$ GDP	26.0	76	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.1	57	
7.1.3	ICTs & business model creation†	60.5	48	
7.1.4	ICTs & organizational model creation†	60.3	38	●
7.2	Creative goods & services	3.6	117	
7.2.1	Cultural & creative services exports, % total trade	0.1	60	
7.2.2	National feature films/mn pop. 15–69	0.8	81	
7.2.3	Global ent. & media output/th pop. 15–69	2.1	49	
7.2.4	Printing & publishing output manufactures, %◴	0.4	95	○
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	18.6	68	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.4	99	
7.3.2	Country-code TLDs/th pop. 15–69	0.5	103	
7.3.3	Wikipedia edits/pop. 15–69	1298.3	71	
7.3.4	Video uploads on YouTube/pop. 15–69	62.9	60	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Poland

Key indicators

Population (millions)	38.2
GDP (US$ billions)	546.6
GDP per capita, PPP$	22,201.1
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**40.2**	**46**	
Innovation Output Sub-Index		31.9	56	
Innovation Input Sub-Index		48.4	39	
Innovation Efficiency Ratio		0.7	93	
Global Innovation Index 2014 (out of 143)		40.6	45	
1	**Institutions**	**75.3**	**34**	
1.1	Political environment	74.1	35	
1.1.1	Political stability*	87.6	20	●
1.1.2	Government effectiveness*	60.5	40	
1.2	Regulatory environment	75.4	42	
1.2.1	Regulatory quality*	75.7	28	
1.2.2	Rule of law*	68.5	36	
1.2.3	Cost of redundancy dismissal, salary weeks	18.8	85	
1.3	Business environment	76.3	39	
1.3.1	Ease of starting a business*	85.8	71	
1.3.2	Ease of resolving insolvency*	69.7	30	
1.3.3	Ease of paying taxes*	73.5	69	
2	**Human capital & research**	**37.2**	**45**	
2.1	Education	53.6	36	
2.1.1	Expenditure on education, % GDP	4.9	61	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	24.2	42	
2.1.3	School life expectancy, years	15.5	33	
2.1.4	PISA scales in reading, maths, & science	520.5	9	●
2.1.5	Pupil-teacher ratio, secondary	8.7	14	●
2.2	Tertiary education	32.8	66	
2.2.1	Tertiary enrolment, % gross	73.2	21	●
2.2.2	Graduates in science & engineering, %	16.8	68	
2.2.3	Tertiary inbound mobility, %	1.2	80	○
2.3	Research & development (R&D)	25.3	38	
2.3.1	Researchers, FTE/mn pop.	1870.2	36	
2.3.2	Gross expenditure on R&D, % GDP	0.9	39	
2.3.3	QS university ranking, average score top 3*	32.8	42	
3	**Infrastructure**	**45.5**	**47**	
3.1	Information & communication technologies (ICTs)	55.8	46	
3.1.1	ICT access*	70.4	44	
3.1.2	ICT use*	49.4	40	
3.1.3	Government's online service*	54.3	57	
3.1.4	E-participation*	49.0	64	
3.2	General infrastructure	36.0	53	
3.2.1	Electricity output, kWh/cap	4255.9	50	
3.2.2	Logistics performance*	68.0	30	
3.2.3	Gross capital formation, % GDP	20.6	79	
3.3	Ecological sustainability	44.7	46	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.4	58	
3.3.2	Environmental performance*	69.5	30	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.4	43	
4	**Market sophistication**	**49.0**	**60**	
4.1	Credit	31.0	69	
4.1.1	Ease of getting credit*	75.0	16	●
4.1.2	Domestic credit to private sector, % GDP	53.9	61	
4.1.3	Microfinance gross loans, % GDP	0.1	67	○
4.2	Investment	32.0	84	
4.2.1	Ease of protecting investors*	62.5	34	
4.2.2	Market capitalization, % GDP	35.8	53	
4.2.3	Total value of stocks traded, % GDP	13.6	33	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	53	○
4.3	Trade & competition	83.9	33	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	71.2	49	
5	**Business sophistication**	**35.2**	**66**	
5.1	Knowledge workers	45.3	45	
5.1.1	Knowledge-intensive employment, %	35.9	32	
5.1.2	Firms offering formal training, % firms	34.6	53	
5.1.3	GERD performed by business, % of GDP	0.4	40	
5.1.4	GERD financed by business, %	37.3	42	
5.1.5	Females employed w/advanced degrees, % total	18.2	27	
5.2	Innovation linkages	24.8	102	○
5.2.1	University/industry research collaboration†	41.7	71	
5.2.2	State of cluster development†	41.4	89	
5.2.3	GERD financed by abroad, %	13.1	34	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	76	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.1	49	
5.3	Knowledge absorption	35.6	60	
5.3.1	Royalty & license fees payments, % total trade	1.1	23	●
5.3.2	High-tech imports less re-imports, % total trade	9.2	45	
5.3.3	Comm., computer & info. services imp., % total trade	1.2	49	
5.3.4	FDI net inflows, % GDP	-0.9	134	○
6	**Knowledge & technology outputs**	**28.3**	**56**	
6.1	Knowledge creation	24.4	40	
6.1.1	Domestic resident patent app./bn PPP$ GDP	4.7	23	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.4	45	
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.1	25	
6.1.4	Scientific & technical articles/bn PPP$ GDP	24.7	36	
6.1.5	Citable documents H index	336.0	24	●
6.2	Knowledge impact	35.7	81	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.2	67	
6.2.2	New businesses/th pop. 15–64[d]	0.5	86	○
6.2.3	Computer software spending, % GDP	0.3	50	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	11.6	36	
6.2.5	High- & medium-high-tech manufactures, %	33.6	31	
6.3	Knowledge diffusion	24.9	89	
6.3.1	Royalty & license fees receipts, % total trade	0.1	49	
6.3.2	High-tech exports less re-exports, % total trade	5.6	30	
6.3.3	Comm., computer & info. services exp., % total trade	1.4	63	
6.3.4	FDI net outflows, % GDP	-0.8	119	○
7	**Creative outputs**	**35.4**	**53**	
7.1	Intangible assets	36.9	108	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	50.1	51	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.4	43	
7.1.3	ICTs & business model creation†	49.4	95	○
7.1.4	ICTs & organizational model creation†	47.7	89	
7.2	Creative goods & services	31.0	36	
7.2.1	Cultural & creative services exports, % total trade	1.0	14	●
7.2.2	National feature films/mn pop. 15–69	0.9	80	○
7.2.3	Global ent. & media output/th pop. 15–69	9.7	34	
7.2.4	Printing & publishing output manufactures, %	1.1	71	○
7.2.5	Creative goods exports, % total trade	3.9	12	●
7.3	Online creativity	36.8	37	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	8.2	48	
7.3.2	Country-code TLDs/th pop. 15–69	37.2	21	●
7.3.3	Wikipedia edits/pop. 15–69	2614.2	46	
7.3.4	Video uploads on YouTube/pop. 15–69	82.4	29	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[d] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Portugal

Key indicators

Population (millions)	10.6
GDP (US$ billions)	230.0
GDP per capita, PPP$	23,671.0
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**46.6**	**30**	
Innovation Output Sub-Index		39.4	33	
Innovation Input Sub-Index		53.8	28	
Innovation Efficiency Ratio		0.7	62	
Global Innovation Index 2014 (out of 143)		45.6	32	
1	**Institutions**	**80.6**	**25**	
1.1	Political environment	78.5	25	
1.1.1	Political stability*	82.5	36	
1.1.2	Government effectiveness*	74.6	26	
1.2	Regulatory environment	77.1	37	
1.2.1	Regulatory quality*	68.8	36	
1.2.2	Rule of law*	75.1	26	
1.2.3	Cost of redundancy dismissal, salary weeks	17.0	77	
1.3	Business environment	86.1	14	●
1.3.1	Ease of starting a business*	96.3	10	●
1.3.2	Ease of resolving insolvency*	84.2	9	●
1.3.3	Ease of paying taxes*	77.8	52	
2	**Human capital & research**	**47.6**	**25**	
2.1	Education	57.1	18	●
2.1.1	Expenditure on education, % GDP	5.3	46	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	33.5	14	●
2.1.3	School life expectancy, years	16.3	20	
2.1.4	PISA scales in reading, maths, & science	488.0	29	
2.1.5	Pupil-teacher ratio, secondary	8.2	7	●
2.2	Tertiary education	44.8	32	
2.2.1	Tertiary enrolment, % gross	68.9	27	
2.2.2	Graduates in science & engineering, %	25.0	24	
2.2.3	Tertiary inbound mobility, %	4.7	36	
2.3	Research & development (R&D)	40.8	25	
2.3.1	Researchers, FTE/mn pop.	4083.8	20	
2.3.2	Gross expenditure on R&D, % GDP	1.4	26	
2.3.3	QS university ranking, average score top 3*	40.4	35	
3	**Infrastructure**	**50.3**	**33**	
3.1	Information & communication technologies (ICTs)	62.8	39	
3.1.1	ICT access*	76.7	31	
3.1.2	ICT use*	46.1	46	
3.1.3	Government's online service*	63.8	39	
3.1.4	E-participation*	64.7	33	
3.2	General infrastructure	32.2	63	
3.2.1	Electricity output, kWh/cap	4818.8	44	
3.2.2	Logistics performance*	71.4	25	
3.2.3	Gross capital formation, % GDP	15.7	120	○
3.3	Ecological sustainability	55.7	15	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.9	25	
3.3.2	Environmental performance*	75.8	17	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	4.8	21	
4	**Market sophistication**	**55.4**	**34**	
4.1	Credit	50.4	21	
4.1.1	Ease of getting credit*	45.0	80	○
4.1.2	Domestic credit to private sector, % GDP	169.8	8	●
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	32.9	78	○
4.2.1	Ease of protecting investors*	59.2	49	
4.2.2	Market capitalization, % GDP	30.1	56	
4.2.3	Total value of stocks traded, % GDP	12.2	36	
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	19	
4.3	Trade & competition	82.9	38	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	69.1	61	
5	**Business sophistication**	**35.2**	**65**	
5.1	Knowledge workers	45.1	47	
5.1.1	Knowledge-intensive employment, %	34.8	38	
5.1.2	Firms offering formal training, % firms[d]	31.9	59	○
5.1.3	GERD performed by business, % of GDP	0.7	31	
5.1.4	GERD financed by business, %[d]	46.0	26	
5.1.5	Females employed w/advanced degrees, % total	14.9	37	
5.2	Innovation linkages	28.4	88	○
5.2.1	University/industry research collaboration†	61.4	22	
5.2.2	State of cluster development†	53.2	39	
5.2.3	GERD financed by abroad, %[d]	5.2	63	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	83	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.1	41	
5.3	Knowledge absorption	32.2	75	
5.3.1	Royalty & license fees payments, % total trade	0.5	54	
5.3.2	High-tech imports less re-imports, % total trade	6.3	77	○
5.3.3	Comm., computer & info. services imp., % total trade	1.3	46	
5.3.4	FDI net inflows, % GDP	3.6	47	
6	**Knowledge & technology outputs**	**33.2**	**42**	
6.1	Knowledge creation	21.9	44	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.4	43	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.6	37	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.3	40	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	45.0	12	●
6.1.5	Citable documents H index	269.0	31	
6.2	Knowledge impact	47.3	29	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.3	89	○
6.2.2	New businesses/th pop. 15–64[d]	3.6	32	
6.2.3	Computer software spending, % GDP	0.7	10	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	25.7	15	●
6.2.5	High- & medium-high-tech manufactures, %	27.0	43	
6.3	Knowledge diffusion	30.3	55	
6.3.1	Royalty & license fees receipts, % total trade	0.0	73	○
6.3.2	High-tech exports less re-exports, % total trade	2.4	48	
6.3.3	Comm., computer & info. services exp., % total trade	1.5	60	
6.3.4	FDI net outflows, % GDP	2.7	24	
7	**Creative outputs**	**45.7**	**25**	
7.1	Intangible assets	57.7	16	●
7.1.1	Domestic res trademark app./bn PPP$ GDP	91.7	17	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.9	33	
7.1.3	ICTs & business model creation†	71.7	17	●
7.1.4	ICTs & organizational model creation†	68.6	18	
7.2	Creative goods & services	25.4	51	
7.2.1	Cultural & creative services exports, % total trade	0.6	33	
7.2.2	National feature films/mn pop. 15–69	1.7	62	○
7.2.3	Global ent. & media output/th pop. 15–69	26.3	24	
7.2.4	Printing & publishing output manufactures, %	1.5	51	
7.2.5	Creative goods exports, % total trade	1.6	31	
7.3	Online creativity	41.8	29	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	20.8	30	
7.3.2	Country-code TLDs/th pop. 15–69	38.2	18	●
7.3.3	Wikipedia edits/pop. 15–69	3156.4	42	
7.3.4	Video uploads on YouTube/pop. 15–69	85.0	24	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[d] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Qatar

Key indicators

Population (millions)	2.3
GDP (US$ billions)	210.0
GDP per capita, PPP$	96,992.9
Income group	High income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**39.0**	**50**	
Innovation Output Sub-Index		29.6	62	
Innovation Input Sub-Index		48.4	40	
Innovation Efficiency Ratio		0.6	110	
Global Innovation Index 2014 (out of 143)		40.3	47	
1	**Institutions**	**77.7**	**30**	
1.1	Political environment	82.3	20	
1.1.1	Political stability*	94.3	10	●
1.1.2	Government effectiveness*	70.3	32	
1.2	Regulatory environment	70.6	51	
1.2.1	Regulatory quality*	67.5	39	
1.2.2	Rule of law*	75.4	25	
1.2.3	Cost of redundancy dismissal, salary weeks	23.2	107	
1.3	Business environment	80.3	27	
1.3.1	Ease of starting a business*	83.1	83	
1.3.2	Ease of resolving insolvency*	58.3	45	
1.3.3	Ease of paying taxes*	99.4	1	●
2	**Human capital & research**	**35.3**	**51**	
2.1	Education	34.4	104	
2.1.1	Expenditure on education, % GDP◴	2.4	120	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	10.3	100	○
2.1.3	School life expectancy, years◴	13.8	63	
2.1.4	PISA scales in reading, maths, & science	382.5	60	○
2.1.5	Pupil-teacher ratio, secondary	9.7	26	
2.2	Tertiary education	62.6	3	●
2.2.1	Tertiary enrolment, % gross	14.3	101	
2.2.2	Graduates in science & engineering, %	33.6	7	●
2.2.3	Tertiary inbound mobility, %	40.7	1	●
2.3	Research & development (R&D)	8.8	71	
2.3.1	Researchers, FTE/mn pop.◴	586.9	56	
2.3.2	Gross expenditure on R&D, % GDP◴	0.5	65	
2.3.3	QS university ranking, average score top 3*	8.6	62	
3	**Infrastructure**	**55.5**	**22**	
3.1	Information & communication technologies (ICTs)	66.6	31	
3.1.1	ICT access*	80.9	21	
3.1.2	ICT use*	59.5	27	
3.1.3	Government's online service*	65.4	37	
3.1.4	E-participation*	60.8	45	
3.2	General infrastructure	61.8	6	●
3.2.1	Electricity output, kWh/cap	16969.3	6	●
3.2.2	Logistics performance*	69.1	28	
3.2.3	Gross capital formation, % GDP	29.0	26	
3.3	Ecological sustainability	37.9	70	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.5	78	
3.3.2	Environmental performance*	63.0	43	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.8	72	
4	**Market sophistication**	**45.9**	**78**	
4.1	Credit	20.8	110	
4.1.1	Ease of getting credit*	30.0	113	○
4.1.2	Domestic credit to private sector, % GDP	39.3	86	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	34.8	70	
4.2.1	Ease of protecting investors*	45.8	107	
4.2.2	Market capitalization, % GDP	66.4	26	
4.2.3	Total value of stocks traded, % GDP	8.1	43	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	82.2	40	
4.3.1	Applied tariff rate, weighted mean, %	4.1	67	
4.3.2	Intensity of local competition†	78.8	16	
5	**Business sophistication**	**27.7**	**106**	
5.1	Knowledge workers	21.7	117	
5.1.1	Knowledge-intensive employment, %	18.2	80	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	0.1	57	
5.1.4	GERD financed by business, %◴	24.2	56	
5.1.5	Females employed w/advanced degrees, % total	4.5	76	
5.2	Innovation linkages	40.6	40	
5.2.1	University/industry research collaboration†	74.0	8	●
5.2.2	State of cluster development†	70.2	10	●
5.2.3	GERD financed by abroad, %◴	2.4	78	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	11	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	97	
5.3	Knowledge absorption	20.7	136	○
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	2.3	128	○
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	-0.4	130	○
6	**Knowledge & technology outputs**	**24.5**	**80**	
6.1	Knowledge creation	2.8	128	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.0	110	○
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	75	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	3.9	108	
6.1.5	Citable documents H index	60.0	105	
6.2	Knowledge impact	28.6	111	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.4	85	
6.2.2	New businesses/th pop. 15–64	1.7	50	
6.2.3	Computer software spending, % GDP	0.3	58	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	2.2	89	
6.2.5	High- & medium-high-tech manufactures, %◴	20.8	54	
6.3	Knowledge diffusion	42.2	30	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.0	129	○
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	3.9	15	
7	**Creative outputs**	**34.7**	**58**	
7.1	Intangible assets	50.6	44	
7.1.1	Domestic res trademark app./bn PPP$ GDP	2.7	103	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	77.4	4	●
7.1.4	ICTs & organizational model creation†	74.4	7	●
7.2	Creative goods & services	13.3	88	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	31.1	21	
7.2.4	Printing & publishing output manufactures, %◴	1.2	66	
7.2.5	Creative goods exports, % total trade	0.0	121	○
7.3	Online creativity	24.2	53	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	4.9	61	
7.3.2	Country-code TLDs/th pop. 15–69	4.1	58	
7.3.3	Wikipedia edits/pop. 15–69	2058.2	53	
7.3.4	Video uploads on YouTube/pop. 15–69	72.6	53	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Romania

Key indicators

Population (millions)	21.6
GDP (US$ billions)	200.0
GDP per capita, PPP$	13,932.0
Income group	Upper-middle income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**38.2**	**54**	
Innovation Output Sub-Index		32.4	52	
Innovation Input Sub-Index		44.0	57	
Innovation Efficiency Ratio		0.7	58	
Global Innovation Index 2014 (out of 143)		38.1	55	
1	**Institutions**	**69.7**	**46**	
1.1	Political environment	53.7	61	
1.1.1	Political stability*	67.9	57	
1.1.2	Government effectiveness*	39.4	72	
1.2	Regulatory environment	78.5	32	●
1.2.1	Regulatory quality*	63.5	46	
1.2.2	Rule of law*	50.5	58	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	76.9	37	
1.3.1	Ease of starting a business*	91.9	33	●
1.3.2	Ease of resolving insolvency*	58.7	44	
1.3.3	Ease of paying taxes*	80.1	45	
2	**Human capital & research**	**27.8**	**73**	
2.1	Education	38.6	88	
2.1.1	Expenditure on education, % GDP	3.1	107	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	11.9	93	○
2.1.3	School life expectancy, years[d]	14.2	54	
2.1.4	PISA scales in reading, maths, & science	440.3	43	
2.1.5	Pupil-teacher ratio, secondary	12.8	45	
2.2	Tertiary education	32.6	67	
2.2.1	Tertiary enrolment, % gross[d]	51.6	50	
2.2.2	Graduates in science & engineering, %[d]	20.2	55	
2.2.3	Tertiary inbound mobility, %[d]	1.8	69	
2.3	Research & development (R&D)	12.1	63	
2.3.1	Researchers, FTE/mn pop.	862.0	49	
2.3.2	Gross expenditure on R&D, % GDP	0.4	69	
2.3.3	QS university ranking, average score top 3*	17.1	55	
3	**Infrastructure**	**42.4**	**58**	
3.1	Information & communication technologies (ICTs)	49.0	61	
3.1.1	ICT access*	66.2	52	
3.1.2	ICT use*	38.7	58	
3.1.3	Government's online service*	44.1	74	
3.1.4	E-participation*	47.1	70	
3.2	General infrastructure	25.8	96	
3.2.1	Electricity output, kWh/cap	2927.0	64	
3.2.2	Logistics performance*	n/a	n/a	
3.2.3	Gross capital formation, % GDP	22.5	59	
3.3	Ecological sustainability	52.3	20	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.8	72	
3.3.2	Environmental performance*	50.5	77	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	23.2	1	●
4	**Market sophistication**	**45.3**	**81**	
4.1	Credit	33.4	58	
4.1.1	Ease of getting credit*	85.0	7	●
4.1.2	Domestic credit to private sector, % GDP	41.4	82	
4.1.3	Microfinance gross loans, % GDP	0.2	54	
4.2	Investment	26.1	114	○
4.2.1	Ease of protecting investors*	61.7	38	
4.2.2	Market capitalization, % GDP	9.4	90	○
4.2.3	Total value of stocks traded, % GDP	1.3	63	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	67	○
4.3	Trade & competition	76.3	70	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	●
4.3.2	Intensity of local competition†	56.0	115	○
5	**Business sophistication**	**34.7**	**67**	
5.1	Knowledge workers	34.6	81	
5.1.1	Knowledge-intensive employment, %	21.2	68	
5.1.2	Firms offering formal training, % firms	40.8	44	
5.1.3	GERD performed by business, % of GDP	0.1	58	
5.1.4	GERD financed by business, %	31.0	47	
5.1.5	Females employed w/advanced degrees, % total	9.8	64	○
5.2	Innovation linkages	29.9	81	
5.2.1	University/industry research collaboration†	43.2	69	
5.2.2	State of cluster development†	46.4	67	
5.2.3	GERD financed by abroad, %	15.5	29	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	78	
5.3	Knowledge absorption	39.7	42	
5.3.1	Royalty & license fees payments, % total trade	1.1	25	●
5.3.2	High-tech imports less re-imports, % total trade	9.1	47	
5.3.3	Comm., computer & info. services imp., % total trade	1.5	38	
5.3.4	FDI net inflows, % GDP	2.0	86	
6	**Knowledge & technology outputs**	**32.8**	**43**	
6.1	Knowledge creation	11.2	66	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.6	36	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	69	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.1	49	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	17.9	42	
6.1.5	Citable documents H index	153.0	46	
6.2	Knowledge impact	54.4	11	●
6.2.1	Growth rate of PPP$ GDP/worker, %	1.7	55	
6.2.2	New businesses/th pop. 15–64	4.1	30	
6.2.3	Computer software spending, % GDP	0.3	37	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	49.0	1	●
6.2.5	High- & medium-high-tech manufactures, %	36.0	26	
6.3	Knowledge diffusion	32.9	48	
6.3.1	Royalty & license fees receipts, % total trade	0.2	45	
6.3.2	High-tech exports less re-exports, % total trade	4.5	34	
6.3.3	Comm., computer & info. services exp., % total trade	3.3	18	●
6.3.4	FDI net outflows, % GDP	0.0	110	○
7	**Creative outputs**	**32.1**	**72**	
7.1	Intangible assets	39.3	93	
7.1.1	Domestic res trademark app./bn PPP$ GDP	64.0	33	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.2	51	○
7.1.3	ICTs & business model creation†	51.8	83	
7.1.4	ICTs & organizational model creation†	48.5	84	
7.2	Creative goods & services	21.9	61	
7.2.1	Cultural & creative services exports, % total trade	0.7	27	
7.2.2	National feature films/mn pop. 15–69	2.3	56	
7.2.3	Global ent. & media output/th pop. 15–69	4.1	46	○
7.2.4	Printing & publishing output manufactures, %	1.1	69	
7.2.5	Creative goods exports, % total trade	1.5	32	●
7.3	Online creativity	27.7	47	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	5.2	59	
7.3.2	Country-code TLDs/th pop. 15–69	19.7	34	●
7.3.3	Wikipedia edits/pop. 15–69	934.5	78	
7.3.4	Video uploads on YouTube/pop. 15–69	79.1	35	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[d] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Russian Federation

Key indicators

Population (millions)	142.5
GDP (US$ billions)	1,857.5
GDP per capita, PPP$	18,407.8
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**39.3**	**48**	
Innovation Output Sub-Index		33.3	49	
Innovation Input Sub-Index		45.3	52	
Innovation Efficiency Ratio		0.7	60	
Global Innovation Index 2014 (out of 143)		39.1	49	
1	**Institutions**	**56.6**	**80**	
1.1	Political environment	38.6	105	○
1.1.1	Political stability*	45.6	108	○
1.1.2	Government effectiveness*	31.6	88	
1.2	Regulatory environment	56.9	96	
1.2.1	Regulatory quality*	38.0	102	○
1.2.2	Rule of law*	26.8	112	○
1.2.3	Cost of redundancy dismissal, salary weeks	17.4	81	
1.3	Business environment	74.2	50	
1.3.1	Ease of starting a business*	92.2	29	
1.3.2	Ease of resolving insolvency*	49.7	62	
1.3.3	Ease of paying taxes*	80.6	43	
2	**Human capital & research**	**47.5**	**26**	
2.1	Education	57.0	20	●
2.1.1	Expenditure on education, % GDP◴	4.1	82	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	14.7	45	
2.1.4	PISA scales in reading, maths, & science	481.2	35	
2.1.5	Pupil-teacher ratio, secondary	8.8	15	●
2.2	Tertiary education	47.1	24	
2.2.1	Tertiary enrolment, % gross	76.1	17	●
2.2.2	Graduates in science & engineering, %◴	28.1	13	●
2.2.3	Tertiary inbound mobility, %	2.2	64	
2.3	Research & development (R&D)	38.5	28	
2.3.1	Researchers, FTE/mn pop.	3084.6	27	
2.3.2	Gross expenditure on R&D, % GDP	1.1	33	
2.3.3	QS university ranking, average score top 3*	52.1	25	
3	**Infrastructure**	**40.6**	**65**	
3.1	Information & communication technologies (ICTs)	65.4	35	
3.1.1	ICT access*	72.5	40	
3.1.2	ICT use*	49.7	39	
3.1.3	Government's online service*	70.9	27	
3.1.4	E-participation*	68.6	30	
3.2	General infrastructure	29.8	74	
3.2.1	Electricity output, kWh/cap	7450.1	27	
3.2.2	Logistics performance*	27.2	85	
3.2.3	Gross capital formation, % GDP	20.5	81	
3.3	Ecological sustainability	26.6	114	○
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	2.9	115	○
3.3.2	Environmental performance*	53.5	65	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	95	
4	**Market sophistication**	**43.5**	**94**	
4.1	Credit	23.8	96	
4.1.1	Ease of getting credit*	55.0	56	
4.1.2	Domestic credit to private sector, % GDP	52.5	63	
4.1.3	Microfinance gross loans, % GDP	0.0	81	○
4.2	Investment	32.3	82	
4.2.1	Ease of protecting investors*	50.8	88	
4.2.2	Market capitalization, % GDP	43.4	46	
4.2.3	Total value of stocks traded, % GDP	36.3	23	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	44	
4.3	Trade & competition	74.4	81	
4.3.1	Applied tariff rate, weighted mean, %	5.0	82	
4.3.2	Intensity of local competition†	66.2	71	
5	**Business sophistication**	**38.4**	**44**	
5.1	Knowledge workers	59.1	26	
5.1.1	Knowledge-intensive employment, %	43.6	16	●
5.1.2	Firms offering formal training, % firms◴	46.1	34	
5.1.3	GERD performed by business, % of GDP	0.7	29	
5.1.4	GERD financed by business, %	28.2	54	
5.1.5	Females employed w/advanced degrees, % total	32.9	2	●
5.2	Innovation linkages	19.6	127	○
5.2.1	University/industry research collaboration†	43.9	65	
5.2.2	State of cluster development†	35.6	114	○
5.2.3	GERD financed by abroad, %	3.0	74	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	56	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	64	
5.3	Knowledge absorption	36.6	55	
5.3.1	Royalty & license fees payments, % total trade	1.6	15	●
5.3.2	High-tech imports less re-imports, % total trade	7.1	63	
5.3.3	Comm., computer & info. services imp., % total trade	1.1	53	
5.3.4	FDI net inflows, % GDP	3.4	51	
6	**Knowledge & technology outputs**	**36.6**	**33**	
6.1	Knowledge creation	39.9	21	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	8.2	9	●
6.1.2	PCT resident patent app./bn PPP$ GDP	0.2	47	
6.1.3	Domestic res utility model app./bn PPP$ GDP	3.9	8	●
6.1.4	Scientific & technical articles/bn PPP$ GDP	8.2	74	
6.1.5	Citable documents H index	355.0	21	●
6.2	Knowledge impact	36.0	79	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.6	56	
6.2.2	New businesses/th pop. 15–64	4.3	29	
6.2.3	Computer software spending, % GDP	0.3	54	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.4	74	
6.2.5	High- & medium-high-tech manufactures, %	26.0	45	
6.3	Knowledge diffusion	33.9	42	
6.3.1	Royalty & license fees receipts, % total trade	0.1	46	
6.3.2	High-tech exports less re-exports, % total trade	1.7	53	
6.3.3	Comm., computer & info. services exp., % total trade	0.8	82	
6.3.4	FDI net outflows, % GDP	4.1	13	●
7	**Creative outputs**	**30.1**	**79**	
7.1	Intangible assets	37.4	104	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	48.2	54	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.4	47	
7.1.3	ICTs & business model creation†	50.4	90	
7.1.4	ICTs & organizational model creation†	50.3	76	
7.2	Creative goods & services	17.0	78	
7.2.1	Cultural & creative services exports, % total trade	0.8	19	
7.2.2	National feature films/mn pop. 15–69	0.7	87	○
7.2.3	Global ent. & media output/th pop. 15–69	7.1	41	○
7.2.4	Printing & publishing output manufactures, %	1.2	62	
7.2.5	Creative goods exports, % total trade	0.4	62	
7.3	Online creativity	28.3	46	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.8	64	
7.3.2	Country-code TLDs/th pop. 15–69	19.3	35	
7.3.3	Wikipedia edits/pop. 15–69	1569.0	63	
7.3.4	Video uploads on YouTube/pop. 15–69	78.6	37	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Rwanda

Key indicators

Population (millions)	12.1
GDP (US$ billions)	8.0
GDP per capita, PPP$	1,644.3
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**30.1**	**94**	
Innovation Output Sub-Index		17.8	128	○
Innovation Input Sub-Index		42.3	66	
Innovation Efficiency Ratio		0.4	131	○
Global Innovation Index 2014 (out of 143)		29.3	102	
1	**Institutions**	**63.2**	**61**	
1.1	Political environment	51.7	64	
1.1.1	Political stability*	62.1	72	
1.1.2	Government effectiveness*	41.4	67	
1.2	Regulatory environment	68.2	62	
1.2.1	Regulatory quality*	48.7	72	
1.2.2	Rule of law*	43.7	67	
1.2.3	Cost of redundancy dismissal, salary weeks	13.0	50	
1.3	Business environment	69.7	65	
1.3.1	Ease of starting a business*	81.7	91	
1.3.2	Ease of resolving insolvency*	41.8	94	
1.3.3	Ease of paying taxes*	85.8	26	●
2	**Human capital & research**	**21.9**	**99**	
2.1	Education	41.4	82	
2.1.1	Expenditure on education, % GDP	5.1	55	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	41.8	5	●
2.1.3	School life expectancy, years	10.3	114	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	22.8	92	
2.2	Tertiary education	24.3	89	
2.2.1	Tertiary enrolment, % gross	6.9	121	○
2.2.2	Graduates in science & engineering, %	22.5	34	●
2.2.3	Tertiary inbound mobility, %	0.8	87	
2.3	Research & development (R&D)	0.0	126	
2.3.1	Researchers, FTE/mn pop.◴	11.7	103	○
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**29.9**	**98**	
3.1	Information & communication technologies (ICTs)	32.8	99	
3.1.1	ICT access*	24.3	128	○
3.1.2	ICT use*	4.9	123	
3.1.3	Government's online service*	51.2	63	
3.1.4	E-participation*	51.0	63	
3.2	General infrastructure	32.9	61	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	30.5	77	
3.2.3	Gross capital formation, % GDP	23.9	50	
3.3	Ecological sustainability	23.9	124	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	35.4	122	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	124	
4	**Market sophistication**	**58.4**	**26**	●
4.1	Credit	53.7	19	●
4.1.1	Ease of getting credit*	90.0	4	●
4.1.2	Domestic credit to private sector, % GDP◴	11.2	135	○
4.1.3	Microfinance gross loans, % GDP	5.8	6	●
4.2	Investment	46.7	33	
4.2.1	Ease of protecting investors*	46.7	102	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	74.7	78	
4.3.1	Applied tariff rate, weighted mean, %	4.6	77	
4.3.2	Intensity of local competition†	65.6	75	
5	**Business sophistication**	**38.3**	**45**	●
5.1	Knowledge workers	36.9	73	
5.1.1	Knowledge-intensive employment, %◴	3.8	113	○
5.1.2	Firms offering formal training, % firms◴	55.4	17	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	47.3	20	
5.2.1	University/industry research collaboration†	44.2	62	
5.2.2	State of cluster development†	48.9	56	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	30.6	89	
5.3.1	Royalty & license fees payments, % total trade◴	0.1	111	
5.3.2	High-tech imports less re-imports, % total trade	10.6	28	●
5.3.3	Comm., computer & info. services imp., % total trade◴	0.8	71	
5.3.4	FDI net inflows, % GDP	1.5	99	
6	**Knowledge & technology outputs**	**14.1**	**125**	
6.1	Knowledge creation	9.6	72	
6.1.1	Domestic resident patent app./bn PPP$ GDP◴	2.4	41	
6.1.2	PCT resident patent app./bn PPP$ GDP◴	0.1	74	
6.1.3	Domestic res utility model app./bn PPP$ GDP◴	0.7	33	
6.1.4	Scientific & technical articles/bn PPP$ GDP	8.4	72	
6.1.5	Citable documents H index	43.0	122	
6.2	Knowledge impact	3.7	135	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	1.1	65	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.2	138	○
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	29.0	64	
6.3.1	Royalty & license fees receipts, % total trade◴	2.0	9	●
6.3.2	High-tech exports less re-exports, % total trade	0.1	101	
6.3.3	Comm., computer & info. services exp., % total trade◴	1.0	78	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**21.6**	**115**	
7.1	Intangible assets	42.6	85	
7.1.1	Domestic res trademark app./bn PPP$ GDP◴	6.7	100	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	66.7	27	●
7.1.4	ICTs & organizational model creation†	58.8	45	●
7.2	Creative goods & services	0.9	132	○
7.2.1	Cultural & creative services exports, % total trade	0.0	78	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.0	109	
7.3	Online creativity	0.2	129	○
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.2	128	○
7.3.2	Country-code TLDs/th pop. 15–69	0.0	128	○
7.3.3	Wikipedia edits/pop. 15–69	38.6	126	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Saudi Arabia

Key indicators

Population (millions)	29.4
GDP (US$ billions)	752.5
GDP per capita, PPP$	32,340.1
Income group	High income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**40.7**	**43**	
Innovation Output Sub-Index		34.0	44	
Innovation Input Sub-Index		47.3	45	
Innovation Efficiency Ratio		0.7	69	
Global Innovation Index 2014 (out of 143)		41.6	38	
1	**Institutions**	**60.4**	**68**	
1.1	Political environment	48.5	73	
1.1.1	Political stability*	54.1	89	
1.1.2	Government effectiveness*	43.0	64	
1.2	Regulatory environment	64.8	77	
1.2.1	Regulatory quality*	49.9	68	
1.2.2	Rule of law*	54.7	52	
1.2.3	Cost of redundancy dismissal, salary weeks	19.5	89	
1.3	Business environment	67.9	77	
1.3.1	Ease of starting a business*	82.7	89	
1.3.2	Ease of resolving insolvency*	21.7	136	○
1.3.3	Ease of paying taxes*	99.2	3	●
2	**Human capital & research**	**39.8**	**39**	
2.1	Education	49.5	55	
2.1.1	Expenditure on education, % GDP◴	5.1	51	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	18.1	67	
2.1.3	School life expectancy, years	16.3	21	●
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	11.3	36	
2.2	Tertiary education	46.6	26	●
2.2.1	Tertiary enrolment, % gross	57.5	43	
2.2.2	Graduates in science & engineering, %	29.0	11	●
2.2.3	Tertiary inbound mobility, %	4.6	38	
2.3	Research & development (R&D)	23.4	41	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP◴	0.1	110	○
2.3.3	QS university ranking, average score top 3*	45.4	31	
3	**Infrastructure**	**50.2**	**34**	
3.1	Information & communication technologies (ICTs)	63.0	37	
3.1.1	ICT access*	70.4	44	
3.1.2	ICT use*	47.7	41	
3.1.3	Government's online service*	77.2	18	●
3.1.4	E-participation*	56.9	51	
3.2	General infrastructure	49.5	17	●
3.2.1	Electricity output, kWh/cap	9603.4	14	●
3.2.2	Logistics performance*	50.4	47	
3.2.3	Gross capital formation, % GDP	30.8	20	●
3.3	Ecological sustainability	38.2	67	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.4	82	
3.3.2	Environmental performance*	66.7	35	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	116	○
4	**Market sophistication**	**50.3**	**55**	
4.1	Credit	31.0	68	
4.1.1	Ease of getting credit*	50.0	65	
4.1.2	Domestic credit to private sector, % GDP	40.3	83	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	40.6	50	
4.2.1	Ease of protecting investors*	57.5	60	
4.2.2	Market capitalization, % GDP	50.9	37	
4.2.3	Total value of stocks traded, % GDP	70.1	9	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	72	○
4.3	Trade & competition	79.3	57	
4.3.1	Applied tariff rate, weighted mean, %	4.3	73	
4.3.2	Intensity of local competition†	73.5	38	
5	**Business sophistication**	**35.8**	**64**	
5.1	Knowledge workers	33.8	82	
5.1.1	Knowledge-intensive employment, %	26.6	53	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total◴	4.4	78	○
5.2	Innovation linkages	42.3	32	
5.2.1	University/industry research collaboration†	53.3	36	
5.2.2	State of cluster development†	61.0	21	●
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	30	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	71	
5.3	Knowledge absorption	31.2	84	
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	6.0	83	
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	1.2	105	○
6	**Knowledge & technology outputs**	**25.1**	**74**	
6.1	Knowledge creation	8.9	78	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.3	83	○
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	6.9	82	
6.1.5	Citable documents H index	144.0	52	
6.2	Knowledge impact	39.8	55	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.2	68	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.3	29	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.5	105	○
6.2.5	High- & medium-high-tech manufactures, %◴	35.9	27	
6.3	Knowledge diffusion	26.6	75	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.1	111	○
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	0.7	61	
7	**Creative outputs**	**42.9**	**30**	●
7.1	Intangible assets	65.0	8	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	65.9	29	●
7.1.4	ICTs & organizational model creation†	64.1	24	●
7.2	Creative goods & services	18.2	72	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	10.2	33	
7.2.4	Printing & publishing output manufactures, %◴	2.3	22	
7.2.5	Creative goods exports, % total trade	0.1	88	○
7.3	Online creativity	23.5	58	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.8	62	
7.3.2	Country-code TLDs/th pop. 15–69	0.8	90	
7.3.3	Wikipedia edits/pop. 15–69	1469.8	67	
7.3.4	Video uploads on YouTube/pop. 15–69	78.5	39	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Senegal

Key indicators

Population (millions)	14.5
GDP (US$ billions)	15.6
GDP per capita, PPP$	2,019.7
Income group	Lower-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**31.0**	**84**	
Innovation Output Sub-Index		27.8	72	
Innovation Input Sub-Index		34.1	110	
Innovation Efficiency Ratio		0.8	24	●
Global Innovation Index 2014 (out of 143)		30.1	98	
1	**Institutions**	**54.3**	**89**	
1.1	Political environment	45.2	81	
1.1.1	Political stability*	62.0	73	
1.1.2	Government effectiveness*	28.5	97	
1.2	Regulatory environment	65.0	75	
1.2.1	Regulatory quality*	46.5	73	
1.2.2	Rule of law*	40.4	77	
1.2.3	Cost of redundancy dismissal, salary weeks	14.8	63	●
1.3	Business environment	52.6	129	
1.3.1	Ease of starting a business*	85.0	75	
1.3.2	Ease of resolving insolvency*	41.9	93	
1.3.3	Ease of paying taxes*	30.9	138	○
2	**Human capital & research**	**14.4**	**128**	
2.1	Education	31.5	112	
2.1.1	Expenditure on education, % GDP[d]	5.6	40	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap[d]	29.0	26	●
2.1.3	School life expectancy, years[d]	7.9	127	○
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary[d]	27.4	101	
2.2	Tertiary education	5.9	131	○
2.2.1	Tertiary enrolment, % gross[d]	7.6	118	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	5.6	79	
2.3.1	Researchers, FTE/mn pop.[d]	361.3	64	
2.3.2	Gross expenditure on R&D, % GDP[d]	0.5	58	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**27.6**	**108**	
3.1	Information & communication technologies (ICTs)	27.7	107	
3.1.1	ICT access*	32.3	111	
3.1.2	ICT use*	12.5	107	
3.1.3	Government's online service*	30.7	101	
3.1.4	E-participation*	35.3	88	
3.2	General infrastructure	27.0	87	
3.2.1	Electricity output, kWh/cap	251.3	113	○
3.2.2	Logistics performance*	23.5	96	
3.2.3	Gross capital formation, % GDP	27.4	33	●
3.3	Ecological sustainability	28.1	105	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.5	81	
3.3.2	Environmental performance*	40.8	104	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	102	
4	**Market sophistication**	**46.1**	**75**	
4.1	Credit	24.1	92	
4.1.1	Ease of getting credit*	30.0	113	
4.1.2	Domestic credit to private sector, % GDP	33.0	91	
4.1.3	Microfinance gross loans, % GDP	2.7	21	●
4.2	Investment	45.8	37	
4.2.1	Ease of protecting investors*	45.8	107	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	68.3	101	
4.3.1	Applied tariff rate, weighted mean, %	8.0	107	
4.3.2	Intensity of local competition†	64.8	78	
5	**Business sophistication**	**28.3**	**101**	
5.1	Knowledge workers	8.3	136	○
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms[d]	16.3	97	
5.1.3	GERD performed by business, % of GDP[d]	0.0	85	○
5.1.4	GERD financed by business, %[d]	4.1	77	
5.1.5	Females employed w/advanced degrees, % total[d]	0.7	84	○
5.2	Innovation linkages	45.0	24	●
5.2.1	University/industry research collaboration†	44.0	63	
5.2.2	State of cluster development†	38.8	100	
5.2.3	GERD financed by abroad, %[d]	40.5	11	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	31.7	78	
5.3.1	Royalty & license fees payments, % total trade[d]	0.1	104	
5.3.2	High-tech imports less re-imports, % total trade	3.1	122	○
5.3.3	Comm., computer & info. services imp., % total trade[d]	2.0	13	●
5.3.4	FDI net inflows, % GDP	2.0	85	
6	**Knowledge & technology outputs**	**22.4**	**91**	
6.1	Knowledge creation	8.1	84	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	65	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	10.7	67	
6.1.5	Citable documents H index	83.0	85	
6.2	Knowledge impact	26.5	116	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.9	73	
6.2.2	New businesses/th pop. 15–64	0.3	94	
6.2.3	Computer software spending, % GDP	0.3	60	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.7	99	
6.2.5	High- & medium-high-tech manufactures, %[d]	15.3	63	
6.3	Knowledge diffusion	32.6	49	●
6.3.1	Royalty & license fees receipts, % total trade[d]	0.1	64	
6.3.2	High-tech exports less re-exports, % total trade	0.1	97	
6.3.3	Comm., computer & info. services exp., % total trade[d]	4.6	9	●
6.3.4	FDI net outflows, % GDP[d]	0.3	75	
7	**Creative outputs**	**33.1**	**66**	
7.1	Intangible assets	56.6	20	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	59.9	51	●
7.1.4	ICTs & organizational model creation†	53.3	62	●
7.2	Creative goods & services	9.6	98	
7.2.1	Cultural & creative services exports, % total trade	0.0	84	○
7.2.2	National feature films/mn pop. 15–69	0.4	98	○
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %[d]	1.5	47	
7.2.5	Creative goods exports, % total trade[d]	0.2	83	
7.3	Online creativity	9.7	79	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.3	102	
7.3.2	Country-code TLDs/th pop. 15–69	0.2	112	
7.3.3	Wikipedia edits/pop. 15–69	51.4	119	
7.3.4	Video uploads on YouTube/pop. 15–69	36.8	69	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[d] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Serbia

Key indicators

Population (millions)	9.5
GDP (US$ billions)	43.9
GDP per capita, PPP$	11,553.4
Income group	Upper-middle income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**36.5**	**63**	
Innovation Output Sub-Index		31.2	59	
Innovation Input Sub-Index		41.8	70	
Innovation Efficiency Ratio		0.7	55	
Global Innovation Index 2014 (out of 143)		35.9	67	
1	**Institutions**	**62.2**	**64**	
1.1	Political environment	50.2	70	
1.1.1	Political stability*	61.8	74	
1.1.2	Government effectiveness*	38.6	77	
1.2	Regulatory environment	71.1	49	
1.2.1	Regulatory quality*	45.8	75	
1.2.2	Rule of law*	38.5	80	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	65.2	83	
1.3.1	Ease of starting a business*	88.9	56	
1.3.2	Ease of resolving insolvency*	57.9	46	
1.3.3	Ease of paying taxes*	48.9	126	○
2	**Human capital & research**	**30.1**	**64**	
2.1	Education	35.3	99	○
2.1.1	Expenditure on education, % GDP	0.1	130	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	13.9	89	○
2.1.3	School life expectancy, years	14.4	51	
2.1.4	PISA scales in reading, maths, & science	446.6	41	
2.1.5	Pupil-teacher ratio, secondary	9.0	18	●
2.2	Tertiary education	40.8	42	
2.2.1	Tertiary enrolment, % gross	56.4	44	
2.2.2	Graduates in science & engineering, %	24.8	27	
2.2.3	Tertiary inbound mobility, %	3.7	48	
2.3	Research & development (R&D)	14.0	58	
2.3.1	Researchers, FTE/mn pop.◴	1235.5	44	
2.3.2	Gross expenditure on R&D, % GDP◴	1.0	34	
2.3.3	QS university ranking, average score top 3*	4.5	70	
3	**Infrastructure**	**42.6**	**56**	
3.1	Information & communication technologies (ICTs)	49.0	60	
3.1.1	ICT access*	72.2	41	
3.1.2	ICT use*	43.4	50	
3.1.3	Government's online service*	39.4	82	
3.1.4	E-participation*	41.2	79	
3.2	General infrastructure	30.3	71	
3.2.1	Electricity output, kWh/cap	5009.8	42	
3.2.2	Logistics performance*	40.9	61	
3.2.3	Gross capital formation, % GDP	20.7	78	
3.3	Ecological sustainability	48.4	34	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.8	100	○
3.3.2	Environmental performance*	69.1	31	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	7.9	13	●
4	**Market sophistication**	**43.9**	**90**	
4.1	Credit	31.1	67	
4.1.1	Ease of getting credit*	60.0	48	
4.1.2	Domestic credit to private sector, % GDP	43.6	77	
4.1.3	Microfinance gross loans, % GDP	1.7	30	
4.2	Investment	34.6	72	
4.2.1	Ease of protecting investors*	63.3	31	
4.2.2	Market capitalization, % GDP	18.3	72	
4.2.3	Total value of stocks traded, % GDP	0.7	73	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	66.1	111	○
4.3.1	Applied tariff rate, weighted mean, %◴	6.0	90	
4.3.2	Intensity of local competition†	53.3	122	○
5	**Business sophistication**	**30.2**	**95**	
5.1	Knowledge workers	30.9	92	
5.1.1	Knowledge-intensive employment, %	28.1	49	
5.1.2	Firms offering formal training, % firms	30.6	65	
5.1.3	GERD performed by business, % of GDP◴	0.2	46	
5.1.4	GERD financed by business, %◴	5.8	72	○
5.1.5	Females employed w/advanced degrees, % total	12.2	52	
5.2	Innovation linkages	21.0	119	○
5.2.1	University/industry research collaboration†	37.3	92	
5.2.2	State of cluster development†	36.5	111	○
5.2.3	GERD financed by abroad, %◴	9.2	44	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	63	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	62	
5.3	Knowledge absorption	38.7	45	
5.3.1	Royalty & license fees payments, % total trade	1.0	28	
5.3.2	High-tech imports less re-imports, % total trade	6.6	71	
5.3.3	Comm., computer & info. services imp., % total trade	1.7	25	●
5.3.4	FDI net inflows, % GDP	3.2	56	
6	**Knowledge & technology outputs**	**27.7**	**59**	
6.1	Knowledge creation	21.2	47	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.1	46	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	56	
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.7	32	
6.1.4	Scientific & technical articles/bn PPP$ GDP	51.6	8	●
6.1.5	Citable documents H index	86.0	83	
6.2	Knowledge impact	29.9	105	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	1.7	52	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	24.7	16	●
6.2.5	High- & medium-high-tech manufactures, %	19.7	57	
6.3	Knowledge diffusion	32.1	50	
6.3.1	Royalty & license fees receipts, % total trade	0.2	37	
6.3.2	High-tech exports less re-exports, % total trade	2.0	50	
6.3.3	Comm., computer & info. services exp., % total trade	2.7	22	●
6.3.4	FDI net outflows, % GDP	0.8	56	
7	**Creative outputs**	**34.6**	**60**	
7.1	Intangible assets	38.0	99	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	43.7	58	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.8	14	●
7.1.3	ICTs & business model creation†	46.0	106	○
7.1.4	ICTs & organizational model creation†	42.6	106	○
7.2	Creative goods & services	33.3	34	
7.2.1	Cultural & creative services exports, % total trade	1.7	1	●
7.2.2	National feature films/mn pop. 15–69	2.6	54	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	1.7	38	
7.2.5	Creative goods exports, % total trade	0.7	48	
7.3	Online creativity	29.0	44	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.5	95	
7.3.2	Country-code TLDs/th pop. 15–69	5.1	53	
7.3.3	Wikipedia edits/pop. 15–69	4693.0	29	●
7.3.4	Video uploads on YouTube/pop. 15–69	74.9	46	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Seychelles

Key indicators

Population (millions)	0.1
GDP (US$ billions)	1.4
GDP per capita, PPP$	27,575.9
Income group	Upper-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**36.4**	**65**	
Innovation Output Sub-Index		29.2	64	
Innovation Input Sub-Index		43.7	59	
Innovation Efficiency Ratio		0.7	88	
Global Innovation Index 2014 (out of 143)		38.6	51	
1	**Institutions**	**68.7**	**49**	
1.1	Political environment	67.3	46	●
1.1.1	Political stability*	85.7	30	●
1.1.2	Government effectiveness*	49.0	55	
1.2	Regulatory environment	68.3	61	
1.2.1	Regulatory quality*	40.0	90	
1.2.2	Rule of law*	48.8	60	
1.2.3	Cost of redundancy dismissal, salary weeks	11.9	46	●
1.3	Business environment	70.4	63	
1.3.1	Ease of starting a business*	77.5	104	
1.3.2	Ease of resolving insolvency*	52.2	58	
1.3.3	Ease of paying taxes*	81.5	38	●
2	**Human capital & research**	**24.2**	**88**	
2.1	Education	36.2	93	
2.1.1	Expenditure on education, % GDP	3.6	97	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	6.8	109	○
2.1.3	School life expectancy, years	13.4	73	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	12.2	42	
2.2	Tertiary education	33.6	62	
2.2.1	Tertiary enrolment, % gross	1.3	133	○
2.2.2	Graduates in science & engineering, %◴	25.0	25	●
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	2.9	95	
2.3.1	Researchers, FTE/mn pop.◴	149.3	78	
2.3.2	Gross expenditure on R&D, % GDP◴	0.3	77	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**46.1**	**45**	●
3.1	Information & communication technologies (ICTs)	37.6	90	
3.1.1	ICT access*	64.6	57	
3.1.2	ICT use*	27.4	76	
3.1.3	Government's online service*	33.1	93	
3.1.4	E-participation*	25.5	110	○
3.2	General infrastructure	60.3	7	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	n/a	n/a	
3.2.3	Gross capital formation, % GDP	36.0	10	●
3.3	Ecological sustainability	40.4	56	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	55.6	56	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.3	55	
4	**Market sophistication**	**31.0**	**138**	○
4.1	Credit	7.9	134	○
4.1.1	Ease of getting credit*	10.0	133	○
4.1.2	Domestic credit to private sector, % GDP	21.9	114	○
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	58.3	12	
4.2.1	Ease of protecting investors*	58.3	54	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	26.9	141	○
4.3.1	Applied tariff rate, weighted mean, %◴	28.3	139	○
4.3.2	Intensity of local competition†	53.9	121	○
5	**Business sophistication**	**48.3**	**21**	
5.1	Knowledge workers	43.9	49	
5.1.1	Knowledge-intensive employment, %◴	26.4	54	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	52.7	10	●
5.2.1	University/industry research collaboration†	40.0	77	
5.2.2	State of cluster development†	48.1	60	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	2.2	8	●
5.3	Knowledge absorption	48.4	18	
5.3.1	Royalty & license fees payments, % total trade◴	0.1	96	
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	14.0	7	●
6	**Knowledge & technology outputs**	**18.3**	**113**	○
6.1	Knowledge creation	16.1	54	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	2.1	21	●
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	13.7	56	
6.1.5	Citable documents H index	38.0	128	○
6.2	Knowledge impact	8.0	128	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.9	70	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	30.7	54	
6.3.1	Royalty & license fees receipts, % total trade◴	0.2	44	
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade◴	1.4	62	
6.3.4	FDI net outflows, % GDP	0.5	65	
7	**Creative outputs**	**40.2**	**41**	
7.1	Intangible assets	38.5	97	
7.1.1	Domestic res trademark app./bn PPP$ GDP	46.0	56	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	47.6	100	
7.1.4	ICTs & organizational model creation†	42.9	105	○
7.2	Creative goods & services	n/a	n/a	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	43.6	27	●
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	100.0	1	●
7.3.2	Country-code TLDs/th pop. 15–69	27.3	27	●
7.3.3	Wikipedia edits/pop. 15–69	473.2	93	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Singapore

Key indicators

Population (millions)	5.5
GDP (US$ billions)	308.1
GDP per capita, PPP$	67,035.4
Income group	High income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**59.4**	**7**	
Innovation Output Sub-Index		46.6	20	
Innovation Input Sub-Index		72.1	1	●
Innovation Efficiency Ratio		0.6	100	○
Global Innovation Index 2014 (out of 143)		59.2	7	
1	**Institutions**	**95.4**	**2**	●
1.1	Political environment	97.3	2	●
1.1.1	Political stability*	97.1	5	
1.1.2	Government effectiveness*	97.5	2	●
1.2	Regulatory environment	98.5	1	●
1.2.1	Regulatory quality*	100.0	1	●
1.2.2	Rule of law*	94.0	11	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	90.5	3	●
1.3.1	Ease of starting a business*	96.5	6	
1.3.2	Ease of resolving insolvency*	77.9	17	
1.3.3	Ease of paying taxes*	97.2	5	
2	**Human capital & research**	**60.9**	**5**	
2.1	Education	39.8	86	○
2.1.1	Expenditure on education, % GDP	2.9	110	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	16.7	74	○
2.1.3	School life expectancy, years	n/a	n/a	
2.1.4	PISA scales in reading, maths, & science	555.7	2	●
2.1.5	Pupil-teacher ratio, secondary◴	14.9	64	○
2.2	Tertiary education	81.7	1	●
2.2.1	Tertiary enrolment, % gross	n/a	n/a	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	19.2	6	
2.3	Research & development (R&D)	61.2	13	
2.3.1	Researchers, FTE/mn pop.◴	6437.7	7	
2.3.2	Gross expenditure on R&D, % GDP◴	2.0	18	
2.3.3	QS university ranking, average score top 3*	58.4	20	
3	**Infrastructure**	**69.5**	**1**	●
3.1	Information & communication technologies (ICTs)	86.9	6	
3.1.1	ICT access*	86.1	13	
3.1.2	ICT use*	71.9	14	
3.1.3	Government's online service*	99.2	2	●
3.1.4	E-participation*	90.2	10	
3.2	General infrastructure	57.8	9	
3.2.1	Electricity output, kWh/cap	8835.4	17	
3.2.2	Logistics performance*	94.0	5	
3.2.3	Gross capital formation, % GDP	29.2	23	
3.3	Ecological sustainability	64.0	5	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	13.5	7	
3.3.2	Environmental performance*	81.8	4	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	4.3	24	
4	**Market sophistication**	**71.6**	**6**	
4.1	Credit	58.5	13	
4.1.1	Ease of getting credit*	75.0	16	
4.1.2	Domestic credit to private sector, % GDP	128.9	19	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	67.4	7	
4.2.1	Ease of protecting investors*	80.0	3	●
4.2.2	Market capitalization, % GDP	144.3	5	
4.2.3	Total value of stocks traded, % GDP	54.5	15	
4.2.4	Venture capital deals/tr PPP$ GDP	0.4	11	
4.3	Trade & competition	88.9	8	
4.3.1	Applied tariff rate, weighted mean, %◴	0.1	1	●
4.3.2	Intensity of local competition†	77.8	18	
5	**Business sophistication**	**63.1**	**1**	●
5.1	Knowledge workers	70.2	7	
5.1.1	Knowledge-intensive employment, %	52.7	2	●
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	1.2	17	
5.1.4	GERD financed by business, %◴	53.4	16	
5.1.5	Females employed w/advanced degrees, % total	22.7	14	
5.2	Innovation linkages	50.5	13	
5.2.1	University/industry research collaboration†	76.3	5	
5.2.2	State of cluster development†	68.8	11	
5.2.3	GERD financed by abroad, %◴	5.9	62	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	5	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.8	19	
5.3	Knowledge absorption	68.6	2	●
5.3.1	Royalty & license fees payments, % total trade	3.8	1	●
5.3.2	High-tech imports less re-imports, % total trade	20.7	6	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.6	85	○
5.3.4	FDI net inflows, % GDP	21.4	5	
6	**Knowledge & technology outputs**	**51.5**	**12**	
6.1	Knowledge creation	29.0	34	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.6	37	
6.1.2	PCT resident patent app./bn PPP$ GDP	2.1	20	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	25.7	33	
6.1.5	Citable documents H index	308.0	27	
6.2	Knowledge impact	56.1	7	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.6	59	○
6.2.2	New businesses/th pop. 15–64	8.0	14	
6.2.3	Computer software spending, % GDP	0.4	21	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	13.8	28	
6.2.5	High- & medium-high-tech manufactures, %	69.2	1	●
6.3	Knowledge diffusion	69.3	3	●
6.3.1	Royalty & license fees receipts, % total trade	0.4	26	
6.3.2	High-tech exports less re-exports, % total trade	26.8	1	●
6.3.3	Comm., computer & info. services exp., % total trade◴	0.7	90	○
6.3.4	FDI net outflows, % GDP	9.1	1	●
7	**Creative outputs**	**41.7**	**33**	
7.1	Intangible assets	46.4	64	
7.1.1	Domestic res trademark app./bn PPP$ GDP	17.4	91	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.5	40	○
7.1.3	ICTs & business model creation†	75.6	9	
7.1.4	ICTs & organizational model creation†	72.2	11	
7.2	Creative goods & services	34.3	30	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	3.1	50	
7.2.3	Global ent. & media output/th pop. 15–69	36.7	20	
7.2.4	Printing & publishing output manufactures, %	0.9	76	○
7.2.5	Creative goods exports, % total trade	5.0	10	
7.3	Online creativity	39.7	31	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	30.9	24	
7.3.2	Country-code TLDs/th pop. 15–69	16.7	37	
7.3.3	Wikipedia edits/pop. 15–69	2562.1	48	
7.3.4	Video uploads on YouTube/pop. 15–69	92.5	8	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Slovakia

Key indicators

Population (millions)	5.5
GDP (US$ billions)	100.0
GDP per capita, PPP$	25,524.7
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**43.0**	**36**	
Innovation Output Sub-Index		37.1	38	
Innovation Input Sub-Index		48.9	37	
Innovation Efficiency Ratio		0.8	48	
Global Innovation Index 2014 (out of 143)		41.9	37	
1	**Institutions**	**75.1**	**36**	
1.1	Political environment	76.9	30	
1.1.1	Political stability*	91.4	13	●
1.1.2	Government effectiveness*	62.4	39	
1.2	Regulatory environment	72.2	46	
1.2.1	Regulatory quality*	72.2	33	
1.2.2	Rule of law*	59.5	46	
1.2.3	Cost of redundancy dismissal, salary weeks	18.8	86	
1.3	Business environment	76.2	41	
1.3.1	Ease of starting a business*	87.0	65	
1.3.2	Ease of resolving insolvency*	69.9	29	
1.3.3	Ease of paying taxes*	71.6	78	
2	**Human capital & research**	**33.2**	**53**	
2.1	Education	46.0	64	
2.1.1	Expenditure on education, % GDP	4.1	85	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	18.4	64	
2.1.3	School life expectancy, years	15.1	42	
2.1.4	PISA scales in reading, maths, & science	471.9	37	
2.1.5	Pupil-teacher ratio, secondary	11.3	37	
2.2	Tertiary education	36.2	56	
2.2.1	Tertiary enrolment, % gross	55.1	49	
2.2.2	Graduates in science & engineering, %	20.6	52	
2.2.3	Tertiary inbound mobility, %	4.1	43	
2.3	Research & development (R&D)	17.4	49	
2.3.1	Researchers, FTE/mn pop.	2702.2	30	
2.3.2	Gross expenditure on R&D, % GDP	0.8	40	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**49.3**	**37**	
3.1	Information & communication technologies (ICTs)	58.7	42	
3.1.1	ICT access*	70.3	46	
3.1.2	ICT use*	52.8	34	
3.1.3	Government's online service*	48.8	65	
3.1.4	E-participation*	62.7	40	
3.2	General infrastructure	32.0	65	
3.2.1	Electricity output, kWh/cap	5216.6	40	
3.2.2	Logistics performance*	55.8	41	
3.2.3	Gross capital formation, % GDP	18.6	106	○
3.3	Ecological sustainability	57.2	10	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.8	70	
3.3.2	Environmental performance*	74.5	21	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	9.8	7	●
4	**Market sophistication**	**50.4**	**53**	
4.1	Credit	39.2	45	
4.1.1	Ease of getting credit*	65.0	34	
4.1.2	Domestic credit to private sector, % GDP◴	44.1	76	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	26.2	112	○
4.2.1	Ease of protecting investors*	50.8	88	
4.2.2	Market capitalization, % GDP	5.0	101	○
4.2.3	Total value of stocks traded, % GDP	0.2	93	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	85.8	22	●
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	75.0	30	
5	**Business sophistication**	**36.7**	**58**	
5.1	Knowledge workers	45.0	48	
5.1.1	Knowledge-intensive employment, %	31.8	44	
5.1.2	Firms offering formal training, % firms	44.9	36	
5.1.3	GERD performed by business, % of GDP	0.4	39	
5.1.4	GERD financed by business, %	40.2	37	
5.1.5	Females employed w/advanced degrees, % total	11.9	55	
5.2	Innovation linkages	31.3	69	
5.2.1	University/industry research collaboration†	39.3	81	
5.2.2	State of cluster development†	46.7	66	
5.2.3	GERD financed by abroad, %	18.0	23	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.1	53	
5.3	Knowledge absorption	33.7	66	
5.3.1	Royalty & license fees payments, % total trade	0.2	92	○
5.3.2	High-tech imports less re-imports, % total trade	14.8	14	●
5.3.3	Comm., computer & info. services imp., % total trade	0.4	105	○
5.3.4	FDI net inflows, % GDP	2.2	76	
6	**Knowledge & technology outputs**	**33.7**	**41**	
6.1	Knowledge creation	22.8	42	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.3	59	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.4	40	
6.1.3	Domestic res utility model app./bn PPP$ GDP	2.3	14	
6.1.4	Scientific & technical articles/bn PPP$ GDP	21.5	38	
6.1.5	Citable documents H index	165.0	41	
6.2	Knowledge impact	50.9	19	●
6.2.1	Growth rate of PPP$ GDP/worker, %	0.9	77	○
6.2.2	New businesses/th pop. 15–64	5.1	21	●
6.2.3	Computer software spending, % GDP	0.3	35	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	26.4	12	●
6.2.5	High- & medium-high-tech manufactures, %	55.8	4	●
6.3	Knowledge diffusion	27.5	69	
6.3.1	Royalty & license fees receipts, % total trade	0.0	96	○
6.3.2	High-tech exports less re-exports, % total trade	9.0	25	●
6.3.3	Comm., computer & info. services exp., % total trade	0.8	84	○
6.3.4	FDI net outflows, % GDP	1.1	51	
7	**Creative outputs**	**40.4**	**40**	
7.1	Intangible assets	43.2	81	
7.1.1	Domestic res trademark app./bn PPP$ GDP	68.5	27	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.8	37	
7.1.3	ICTs & business model creation†	52.4	80	
7.1.4	ICTs & organizational model creation†	51.4	72	
7.2	Creative goods & services	40.2	17	●
7.2.1	Cultural & creative services exports, % total trade	0.4	38	
7.2.2	National feature films/mn pop. 15–69	5.3	38	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	0.6	87	○
7.2.5	Creative goods exports, % total trade	10.5	2	●
7.3	Online creativity	34.9	39	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.6	66	
7.3.2	Country-code TLDs/th pop. 15–69	32.5	23	●
7.3.3	Wikipedia edits/pop. 15–69	3369.6	38	
7.3.4	Video uploads on YouTube/pop. 15–69	78.8	36	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Slovenia

Key indicators

Population (millions)	2.1
GDP (US$ billions)	49.5
GDP per capita, PPP$	28,372.8
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**48.5**	**28**	
Innovation Output Sub-Index		43.8	27	
Innovation Input Sub-Index		53.2	30	
Innovation Efficiency Ratio		0.8	22	
Global Innovation Index 2014 (out of 143)		47.2	28	
1	**Institutions**	**79.5**	**29**	
1.1	Political environment	77.0	29	
1.1.1	Political stability*	85.6	31	
1.1.2	Government effectiveness*	68.4	33	
1.2	Regulatory environment	81.7	25	
1.2.1	Regulatory quality*	64.0	44	
1.2.2	Rule of law*	73.4	31	
1.2.3	Cost of redundancy dismissal, salary weeks	10.7	40	
1.3	Business environment	79.7	29	
1.3.1	Ease of starting a business*	94.4	15	
1.3.2	Ease of resolving insolvency*	62.9	40	
1.3.3	Ease of paying taxes*	81.9	37	
2	**Human capital & research**	**48.3**	**24**	
2.1	Education	58.3	12	●
2.1.1	Expenditure on education, % GDP	5.7	36	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	31.4	20	
2.1.3	School life expectancy, years	16.8	13	
2.1.4	PISA scales in reading, maths, & science	498.9	21	
2.1.5	Pupil-teacher ratio, secondary◴	9.0	17	
2.2	Tertiary education	45.6	28	
2.2.1	Tertiary enrolment, % gross	86.0	7	●
2.2.2	Graduates in science & engineering, %	24.7	28	
2.2.3	Tertiary inbound mobility, %	2.3	62	
2.3	Research & development (R&D)	40.8	24	
2.3.1	Researchers, FTE/mn pop.	4202.2	17	
2.3.2	Gross expenditure on R&D, % GDP	2.7	11	●
2.3.3	QS university ranking, average score top 3*	9.2	61	
3	**Infrastructure**	**49.4**	**36**	
3.1	Information & communication technologies (ICTs)	53.2	50	
3.1.1	ICT access*	79.1	23	
3.1.2	ICT use*	52.1	36	
3.1.3	Government's online service*	42.5	77	
3.1.4	E-participation*	39.2	82	○
3.2	General infrastructure	38.4	47	
3.2.1	Electricity output, kWh/cap	7666.5	23	
3.2.2	Logistics performance*	62.3	37	
3.2.3	Gross capital formation, % GDP	20.1	84	
3.3	Ecological sustainability	56.5	13	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.6	55	
3.3.2	Environmental performance*	76.4	15	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	8.0	12	●
4	**Market sophistication**	**46.9**	**70**	
4.1	Credit	28.7	79	
4.1.1	Ease of getting credit*	35.0	102	○
4.1.2	Domestic credit to private sector, % GDP	70.8	45	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	29.5	99	○
4.2.1	Ease of protecting investors*	68.3	14	
4.2.2	Market capitalization, % GDP	14.0	79	○
4.2.3	Total value of stocks traded, % GDP	0.9	69	○
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	55	○
4.3	Trade & competition	82.6	39	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	68.6	64	
5	**Business sophistication**	**42.1**	**35**	
5.1	Knowledge workers	62.9	14	
5.1.1	Knowledge-intensive employment, %	42.2	20	
5.1.2	Firms offering formal training, % firms	41.4	43	
5.1.3	GERD performed by business, % of GDP	2.0	9	
5.1.4	GERD financed by business, %	63.8	5	●
5.1.5	Females employed w/advanced degrees, % total	18.8	25	
5.2	Innovation linkages	29.3	82	
5.2.1	University/industry research collaboration†	49.3	43	
5.2.2	State of cluster development†	40.4	93	○
5.2.3	GERD financed by abroad, %	8.9	46	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.2	34	
5.3	Knowledge absorption	34.0	64	
5.3.1	Royalty & license fees payments, % total trade	0.7	43	
5.3.2	High-tech imports less re-imports, % total trade	5.5	90	○
5.3.3	Comm., computer & info. services imp., % total trade	1.8	22	
5.3.4	FDI net inflows, % GDP	-0.9	135	○
6	**Knowledge & technology outputs**	**38.1**	**30**	
6.1	Knowledge creation	33.9	28	
6.1.1	Domestic resident patent app./bn PPP$ GDP◴	8.0	10	●
6.1.2	PCT resident patent app./bn PPP$ GDP	2.6	17	
6.1.3	Domestic res utility model app./bn PPP$ GDP◴	0.2	48	○
6.1.4	Scientific & technical articles/bn PPP$ GDP	59.4	3	●
6.1.5	Citable documents H index	172.0	40	
6.2	Knowledge impact	50.6	20	
6.2.1	Growth rate of PPP$ GDP/worker, %	-1.0	111	○
6.2.2	New businesses/th pop. 15–64	4.4	27	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	34.0	7	●
6.2.5	High- & medium-high-tech manufactures, %	46.5	9	●
6.3	Knowledge diffusion	29.8	59	
6.3.1	Royalty & license fees receipts, % total trade	0.2	43	
6.3.2	High-tech exports less re-exports, % total trade	4.6	33	
6.3.3	Comm., computer & info. services exp., % total trade	1.8	48	
6.3.4	FDI net outflows, % GDP	0.6	62	
7	**Creative outputs**	**49.4**	**22**	
7.1	Intangible assets	61.0	12	●
7.1.1	Domestic res trademark app./bn PPP$ GDP◴	111.6	8	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	3.1	6	●
7.1.3	ICTs & business model creation†	57.3	64	
7.1.4	ICTs & organizational model creation†	56.7	54	
7.2	Creative goods & services	35.3	27	
7.2.1	Cultural & creative services exports, % total trade	1.0	13	
7.2.2	National feature films/mn pop. 15–69	15.1	11	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	1.9	29	
7.2.5	Creative goods exports, % total trade	0.7	49	
7.3	Online creativity	40.4	30	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	24.1	29	
7.3.2	Country-code TLDs/th pop. 15–69	31.9	26	
7.3.3	Wikipedia edits/pop. 15–69	3298.3	39	
7.3.4	Video uploads on YouTube/pop. 15–69	81.2	31	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

South Africa

Key indicators

Population (millions)	53.1
GDP (US$ billions)	350.1
GDP per capita, PPP$	11,542.9
Income group	Upper-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**37.4**	**60**	
Innovation Output Sub-Index		29.7	61	
Innovation Input Sub-Index		45.2	54	
Innovation Efficiency Ratio		0.7	94	
Global Innovation Index 2014 (out of 143)		38.2	53	
1	**Institutions**	**71.6**	**43**	
1.1	Political environment	57.9	53	
1.1.1	Political stability*	62.7	71	
1.1.2	Government effectiveness*	53.1	48	
1.2	Regulatory environment	76.1	38	
1.2.1	Regulatory quality*	58.7	56	
1.2.2	Rule of law*	51.0	56	
1.2.3	Cost of redundancy dismissal, salary weeks	9.3	29	
1.3	Business environment	80.9	24	●
1.3.1	Ease of starting a business*	89.4	52	
1.3.2	Ease of resolving insolvency*	64.5	37	
1.3.3	Ease of paying taxes*	88.7	18	●
2	**Human capital & research**	**27.4**	**75**	
2.1	Education	42.1	79	
2.1.1	Expenditure on education, % GDP	6.2	26	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	21.6	50	
2.1.3	School life expectancy, years	13.6	67	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	25.0	95	○
2.2	Tertiary education	17.1	109	○
2.2.1	Tertiary enrolment, % gross	19.7	92	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	4.2	42	
2.3	Research & development (R&D)	22.9	43	
2.3.1	Researchers, FTE/mn pop.◴	408.2	61	
2.3.2	Gross expenditure on R&D, % GDP◴	0.8	45	
2.3.3	QS university ranking, average score top 3*	46.0	30	
3	**Infrastructure**	**33.9**	**89**	
3.1	Information & communication technologies (ICTs)	36.9	91	
3.1.1	ICT access*	48.2	80	
3.1.2	ICT use*	27.5	75	
3.1.3	Government's online service*	38.6	85	
3.1.4	E-participation*	33.3	92	○
3.2	General infrastructure	34.6	58	
3.2.1	Electricity output, kWh/cap	4878.6	43	
3.2.2	Logistics performance*	64.8	33	
3.2.3	Gross capital formation, % GDP	19.4	97	
3.3	Ecological sustainability	30.1	95	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.0	109	○
3.3.2	Environmental performance*	53.5	64	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.3	54	
4	**Market sophistication**	**59.1**	**23**	●
4.1	Credit	37.1	49	
4.1.1	Ease of getting credit*	60.0	48	
4.1.2	Domestic credit to private sector, % GDP	156.0	12	●
4.1.3	Microfinance gross loans, % GDP	0.0	82	○
4.2	Investment	60.4	8	●
4.2.1	Ease of protecting investors*	67.5	17	●
4.2.2	Market capitalization, % GDP	160.1	3	●
4.2.3	Total value of stocks traded, % GDP	81.5	6	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	54	○
4.3	Trade & competition	79.8	54	
4.3.1	Applied tariff rate, weighted mean, %	4.2	70	
4.3.2	Intensity of local competition†	74.4	34	
5	**Business sophistication**	**34.0**	**73**	
5.1	Knowledge workers	37.7	70	
5.1.1	Knowledge-intensive employment, %	25.5	55	
5.1.2	Firms offering formal training, % firms◴	36.8	48	
5.1.3	GERD performed by business, % of GDP◴	0.3	41	
5.1.4	GERD financed by business, %◴	38.3	40	
5.1.5	Females employed w/advanced degrees, % total	10.3	63	○
5.2	Innovation linkages	30.3	77	
5.2.1	University/industry research collaboration†	58.1	30	
5.2.2	State of cluster development†	52.7	41	
5.2.3	GERD financed by abroad, %◴	13.1	35	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	53	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	69	
5.3	Knowledge absorption	33.9	65	
5.3.1	Royalty & license fees payments, % total trade	1.7	11	●
5.3.2	High-tech imports less re-imports, % total trade	10.2	31	
5.3.3	Comm., computer & info. services imp., % total trade	0.4	110	○
5.3.4	FDI net inflows, % GDP	2.3	75	
6	**Knowledge & technology outputs**	**28.3**	**58**	
6.1	Knowledge creation	15.5	58	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.9	64	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.4	41	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	15.4	50	
6.1.5	Citable documents H index	260.0	34	
6.2	Knowledge impact	45.6	36	
6.2.1	Growth rate of PPP$ GDP/worker, %	3.5	23	●
6.2.2	New businesses/th pop. 15–64	6.5	18	●
6.2.3	Computer software spending, % GDP	0.4	25	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	5.2	62	
6.2.5	High- & medium-high-tech manufactures, %◴	28.2	41	
6.3	Knowledge diffusion	23.7	94	
6.3.1	Royalty & license fees receipts, % total trade	0.1	69	
6.3.2	High-tech exports less re-exports, % total trade	2.3	49	
6.3.3	Comm., computer & info. services exp., % total trade	0.4	98	○
6.3.4	FDI net outflows, % GDP	1.6	43	
7	**Creative outputs**	**31.1**	**76**	
7.1	Intangible assets	43.6	79	
7.1.1	Domestic res trademark app./bn PPP$ GDP	30.5	70	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	59.0	56	
7.1.4	ICTs & organizational model creation†	55.8	57	
7.2	Creative goods & services	21.4	63	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	0.7	86	○
7.2.3	Global ent. & media output/th pop. 15–69	9.6	35	
7.2.4	Printing & publishing output manufactures, %◴	2.4	19	●
7.2.5	Creative goods exports, % total trade	0.7	47	
7.3	Online creativity	16.0	71	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.8	63	
7.3.2	Country-code TLDs/th pop. 15–69	11.8	41	
7.3.3	Wikipedia edits/pop. 15–69	363.8	98	
7.3.4	Video uploads on YouTube/pop. 15–69	45.9	67	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Spain

Key indicators

Population (millions)	47.1
GDP (US$ billions)	1,406.9
GDP per capita, PPP$	30,637.4
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**49.1**	**27**	
Innovation Output Sub-Index		41.1	29	
Innovation Input Sub-Index		57.0	24	
Innovation Efficiency Ratio		0.7	67	○
Global Innovation Index 2014 (out of 143)		49.3	27	
1	**Institutions**	**75.2**	**35**	
1.1	Political environment	68.4	41	
1.1.1	Political stability*	64.5	65	○
1.1.2	Government effectiveness*	72.4	29	
1.2	Regulatory environment	77.4	35	
1.2.1	Regulatory quality*	72.6	32	
1.2.2	Rule of law*	74.1	30	
1.2.3	Cost of redundancy dismissal, salary weeks	17.4	80	○
1.3	Business environment	79.7	30	
1.3.1	Ease of starting a business*	88.1	62	
1.3.2	Ease of resolving insolvency*	75.9	21	
1.3.3	Ease of paying taxes*	75.3	60	
2	**Human capital & research**	**45.9**	**27**	
2.1	Education	55.0	30	
2.1.1	Expenditure on education, % GDP	5.0	59	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	26.5	31	
2.1.3	School life expectancy, years	17.3	10	●
2.1.4	PISA scales in reading, maths, & science	489.6	27	
2.1.5	Pupil-teacher ratio, secondary	11.4	38	
2.2	Tertiary education	43.0	35	
2.2.1	Tertiary enrolment, % gross	84.6	8	●
2.2.2	Graduates in science & engineering, %	22.2	35	
2.2.3	Tertiary inbound mobility, %	2.8	56	○
2.3	Research & development (R&D)	39.8	27	
2.3.1	Researchers, FTE/mn pop.	2633.5	31	
2.3.2	Gross expenditure on R&D, % GDP	1.3	28	
2.3.3	QS university ranking, average score top 3*	57.6	21	
3	**Infrastructure**	**61.0**	**9**	●
3.1	Information & communication technologies (ICTs)	77.6	15	●
3.1.1	ICT access*	77.0	30	
3.1.2	ICT use*	60.4	26	
3.1.3	Government's online service*	94.5	4	●
3.1.4	E-participation*	78.4	19	
3.2	General infrastructure	38.4	46	
3.2.1	Electricity output, kWh/cap	6118.7	32	
3.2.2	Logistics performance*	79.4	18	
3.2.3	Gross capital formation, % GDP	18.0	110	○
3.3	Ecological sustainability	67.0	3	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	10.3	22	
3.3.2	Environmental performance*	79.8	7	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	10.5	6	●
4	**Market sophistication**	**64.7**	**10**	●
4.1	Credit	58.3	14	●
4.1.1	Ease of getting credit*	60.0	48	
4.1.2	Domestic credit to private sector, % GDP	172.0	7	●
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	50.2	28	
4.2.1	Ease of protecting investors*	64.2	30	
4.2.2	Market capitalization, % GDP	73.4	21	
4.2.3	Total value of stocks traded, % GDP	79.4	7	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	25	
4.3	Trade & competition	85.6	24	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	74.6	33	
5	**Business sophistication**	**38.2**	**47**	
5.1	Knowledge workers	54.4	30	
5.1.1	Knowledge-intensive employment, %	33.1	40	
5.1.2	Firms offering formal training, % firms◴	51.3	24	
5.1.3	GERD performed by business, % of GDP	0.7	30	
5.1.4	GERD financed by business, %◴	45.6	27	
5.1.5	Females employed w/advanced degrees, % total	21.5	18	
5.2	Innovation linkages	28.5	87	○
5.2.1	University/industry research collaboration†	46.2	55	
5.2.2	State of cluster development†	49.7	52	
5.2.3	GERD financed by abroad, %◴	6.6	57	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	50	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.2	33	
5.3	Knowledge absorption	31.6	79	○
5.3.1	Royalty & license fees payments, % total trade	0.5	58	○
5.3.2	High-tech imports less re-imports, % total trade	6.0	81	○
5.3.3	Comm., computer & info. services imp., % total trade	1.3	45	
5.3.4	FDI net inflows, % GDP	3.3	53	
6	**Knowledge & technology outputs**	**39.9**	**25**	
6.1	Knowledge creation	31.3	33	
6.1.1	Domestic resident patent app./bn PPP$ GDP	2.0	47	
6.1.2	PCT resident patent app./bn PPP$ GDP	1.1	30	
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.7	18	
6.1.4	Scientific & technical articles/bn PPP$ GDP	33.6	23	
6.1.5	Citable documents H index	531.0	12	●
6.2	Knowledge impact	51.8	17	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.6	58	○
6.2.2	New businesses/th pop. 15–64	2.7	40	
6.2.3	Computer software spending, % GDP	0.7	9	●
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	28.0	10	●
6.2.5	High- & medium-high-tech manufactures, %	34.8	30	
6.3	Knowledge diffusion	36.6	38	
6.3.1	Royalty & license fees receipts, % total trade	0.2	36	
6.3.2	High-tech exports less re-exports, % total trade	3.9	38	
6.3.3	Comm., computer & info. services exp., % total trade	2.3	32	
6.3.4	FDI net outflows, % GDP	2.3	29	
7	**Creative outputs**	**42.4**	**31**	
7.1	Intangible assets	48.3	56	
7.1.1	Domestic res trademark app./bn PPP$ GDP	57.0	38	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.8	36	○
7.1.3	ICTs & business model creation†	67.2	25	
7.1.4	ICTs & organizational model creation†	60.9	34	
7.2	Creative goods & services	27.0	48	
7.2.1	Cultural & creative services exports, % total trade	0.8	21	
7.2.2	National feature films/mn pop. 15–69	6.9	27	
7.2.3	Global ent. & media output/th pop. 15–69	22.9	25	
7.2.4	Printing & publishing output manufactures, %	1.6	41	
7.2.5	Creative goods exports, % total trade	0.8	41	
7.3	Online creativity	45.9	26	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	31.8	23	
7.3.2	Country-code TLDs/th pop. 15–69	22.1	32	
7.3.3	Wikipedia edits/pop. 15–69	5678.2	20	
7.3.4	Video uploads on YouTube/pop. 15–69	87.8	19	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Sri Lanka

Key indicators

Population (millions)	21.4
GDP (US$ billions)	74.6
GDP per capita, PPP$	7,046.3
Income group	Lower-middle income
Region	Central and Southern Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**30.8**	**85**	
Innovation Output Sub-Index		26.6	79	
Innovation Input Sub-Index		35.0	104	
Innovation Efficiency Ratio		0.8	46	●
Global Innovation Index 2014 (out of 143)		29.0	105	
1	**Institutions**	**41.7**	**128**	○
1.1	Political environment	42.1	91	
1.1.1	Political stability*	49.2	101	
1.1.2	Government effectiveness*	35.1	83	
1.2	Regulatory environment	21.0	137	○
1.2.1	Regulatory quality*	43.5	82	
1.2.2	Rule of law*	40.4	76	
1.2.3	Cost of redundancy dismissal, salary weeks	58.5	138	○
1.3	Business environment	61.9	96	
1.3.1	Ease of starting a business*	83.0	84	
1.3.2	Ease of resolving insolvency*	47.8	67	
1.3.3	Ease of paying taxes*	55.0	121	○
2	**Human capital & research**	**17.8**	**112**	
2.1	Education	30.5	117	○
2.1.1	Expenditure on education, % GDP	1.7	127	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	6.9	108	○
2.1.3	School life expectancy, years	13.7	65	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	17.3	75	
2.2	Tertiary education	19.4	104	
2.2.1	Tertiary enrolment, % gross	17.0	96	
2.2.2	Graduates in science & engineering, %	16.7	71	
2.2.3	Tertiary inbound mobility, %	0.1	106	○
2.3	Research & development (R&D)	3.5	88	
2.3.1	Researchers, FTE/mn pop.◴	103.1	82	
2.3.2	Gross expenditure on R&D, % GDP◴	0.2	97	○
2.3.3	QS university ranking, average score top 3*	5.9	66	
3	**Infrastructure**	**42.4**	**57**	
3.1	Information & communication technologies (ICTs)	44.9	72	
3.1.1	ICT access*	38.5	105	
3.1.2	ICT use*	11.0	108	
3.1.3	Government's online service*	65.4	37	●
3.1.4	E-participation*	64.7	33	●
3.2	General infrastructure	33.3	60	
3.2.1	Electricity output, kWh/cap	585.4	105	○
3.2.2	Logistics performance*	27.2	84	
3.2.3	Gross capital formation, % GDP	32.0	15	●
3.3	Ecological sustainability	49.0	32	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	14.3	4	●
3.3.2	Environmental performance*	53.9	62	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.9	67	
4	**Market sophistication**	**44.9**	**84**	
4.1	Credit	22.2	105	
4.1.1	Ease of getting credit*	45.0	80	
4.1.2	Domestic credit to private sector, % GDP◴	31.1	98	
4.1.3	Microfinance gross loans, % GDP◴	1.1	37	
4.2	Investment	34.5	73	
4.2.1	Ease of protecting investors*	59.2	49	
4.2.2	Market capitalization, % GDP	28.7	59	
4.2.3	Total value of stocks traded, % GDP	2.8	55	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	77.9	63	
4.3.1	Applied tariff rate, weighted mean, %	6.7	99	
4.3.2	Intensity of local competition†	79.4	14	●
5	**Business sophistication**	**28.3**	**102**	
5.1	Knowledge workers	24.2	107	
5.1.1	Knowledge-intensive employment, %	15.7	91	
5.1.2	Firms offering formal training, % firms◴	18.4	94	○
5.1.3	GERD performed by business, % of GDP◴	0.1	67	
5.1.4	GERD financed by business, %◴	40.9	36	
5.1.5	Females employed w/advanced degrees, % total◴	7.6	69	
5.2	Innovation linkages	21.3	118	○
5.2.1	University/industry research collaboration†	34.6	107	
5.2.2	State of cluster development†	47.3	64	
5.2.3	GERD financed by abroad, %◴	2.7	76	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	66	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	60	
5.3	Knowledge absorption	39.4	43	●
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	5.3	94	
5.3.3	Comm., computer & info. services imp., % total trade	2.0	15	●
5.3.4	FDI net inflows, % GDP	1.4	102	
6	**Knowledge & technology outputs**	**26.8**	**64**	
6.1	Knowledge creation	6.6	91	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.6	50	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	64	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.9	116	○
6.1.5	Citable documents H index	96.0	74	
6.2	Knowledge impact	39.2	60	
6.2.1	Growth rate of PPP$ GDP/worker, %	6.2	3	●
6.2.2	New businesses/th pop. 15–64	0.5	88	○
6.2.3	Computer software spending, % GDP	0.3	30	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.3	76	
6.2.5	High- & medium-high-tech manufactures, %◴	8.9	81	
6.3	Knowledge diffusion	34.6	40	●
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.4	81	
6.3.3	Comm., computer & info. services exp., % total trade	3.9	12	●
6.3.4	FDI net outflows, % GDP	0.1	91	
7	**Creative outputs**	**26.3**	**92**	
7.1	Intangible assets	43.5	80	
7.1.1	Domestic res trademark app./bn PPP$ GDP	27.5	74	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	58.3	61	
7.1.4	ICTs & organizational model creation†	57.8	49	●
7.2	Creative goods & services	16.7	79	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	1.0	74	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	1.8	31	●
7.2.5	Creative goods exports, % total trade	0.4	64	
7.3	Online creativity	1.7	110	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.9	106	
7.3.2	Country-code TLDs/th pop. 15–69	0.2	110	
7.3.3	Wikipedia edits/pop. 15–69	536.6	91	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Sudan

Key indicators

Population (millions)	38.8
GDP (US$ billions)	73.8
GDP per capita, PPP$	2,673.2
Income group	Lower-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**15.0**	**141**	○
Innovation Output Sub-Index		8.0	140	○
Innovation Input Sub-Index		21.9	141	○
Innovation Efficiency Ratio		0.4	136	
Global Innovation Index 2014 (out of 143)		12.7	143	
1	**Institutions**	**32.5**	**138**	○
1.1	Political environment	4.9	141	○
1.1.1	Political stability*	9.7	139	○
1.1.2	Government effectiveness*	0.0	141	○
1.2	Regulatory environment	38.1	130	
1.2.1	Regulatory quality*	9.4	136	
1.2.2	Rule of law*	14.3	137	○
1.2.3	Cost of redundancy dismissal, salary weeks	26.0	111	
1.3	Business environment	54.5	118	
1.3.1	Ease of starting a business*	74.7	112	
1.3.2	Ease of resolving insolvency*	26.5	131	
1.3.3	Ease of paying taxes*	62.3	106	●
2	**Human capital & research**	**15.1**	**121**	
2.1	Education	17.2	137	○
2.1.1	Expenditure on education, % GDP◴	2.2	124	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	7.0	130	○
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	31.1	108	
2.2	Tertiary education	24.7	86	●
2.2.1	Tertiary enrolment, % gross	17.2	95	●
2.2.2	Graduates in science & engineering, %	16.0	76	●
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	3.4	90	●
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP◴	0.3	78	●
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**19.7**	**132**	
3.1	Information & communication technologies (ICTs)	26.9	110	
3.1.1	ICT access*	34.6	108	
3.1.2	ICT use*	16.5	99	●
3.1.3	Government's online service*	29.1	109	
3.1.4	E-participation*	27.5	108	
3.2	General infrastructure	10.4	138	○
3.2.1	Electricity output, kWh/cap	196.5	115	
3.2.2	Logistics performance*	0.0	131	○
3.2.3	Gross capital formation, % GDP	17.5	113	
3.3	Ecological sustainability	21.8	129	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.7	75	●
3.3.2	Environmental performance*	24.6	137	○
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	128	
4	**Market sophistication**	**28.6**	**140**	○
4.1	Credit	5.9	138	○
4.1.1	Ease of getting credit*	15.0	129	
4.1.2	Domestic credit to private sector, % GDP	10.4	136	○
4.1.3	Microfinance gross loans, % GDP	0.1	70	
4.2	Investment	31.7	88	
4.2.1	Ease of protecting investors*	31.7	135	○
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	48.1	139	○
4.3.1	Applied tariff rate, weighted mean, %◴	14.7	134	
4.3.2	Intensity of local competition†	n/a	n/a	
5	**Business sophistication**	**13.7**	**140**	○
5.1	Knowledge workers	2.9	140	○
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	0.1	59	●
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	n/a	n/a	
5.2.1	University/industry research collaboration†	n/a	n/a	
5.2.2	State of cluster development†	n/a	n/a	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	24.4	120	
5.3.1	Royalty & license fees payments, % total trade	0.0	126	○
5.3.2	High-tech imports less re-imports, % total trade	9.0	48	●
5.3.3	Comm., computer & info. services imp., % total trade	0.2	116	
5.3.4	FDI net inflows, % GDP	3.3	54	●
6	**Knowledge & technology outputs**	**14.7**	**122**	
6.1	Knowledge creation	2.6	132	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	88	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.0	127	
6.1.5	Citable documents H index	58.0	109	
6.2	Knowledge impact	38.8	62	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.9	74	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.7	120	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	2.7	134	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	84	●
6.3.2	High-tech exports less re-exports, % total trade	0.0	117	
6.3.3	Comm., computer & info. services exp., % total trade◴	0.3	108	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**1.3**	**139**	○
7.1	Intangible assets	1.6	138	○
7.1.1	Domestic res trademark app./bn PPP$ GDP◴	5.9	101	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.1	60	
7.1.3	ICTs & business model creation†	n/a	n/a	
7.1.4	ICTs & organizational model creation†	n/a	n/a	
7.2	Creative goods & services	1.8	127	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade◴	0.1	103	
7.3	Online creativity	0.1	133	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.1	135	
7.3.2	Country-code TLDs/th pop. 15–69	0.0	136	
7.3.3	Wikipedia edits/pop. 15–69	48.9	122	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Swaziland

Key indicators

Population (millions)	1.3
GDP (US$ billions)	3.7
GDP per capita, PPP$	6,366.5
Income group	Lower-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**25.4**	**123**	
Innovation Output Sub-Index		15.0	132	○
Innovation Input Sub-Index		35.7	98	
Innovation Efficiency Ratio		0.4	132	○
Global Innovation Index 2014 (out of 143)		25.3	127	
1	**Institutions**	**56.2**	**82**	
1.1	Political environment	41.4	96	
1.1.1	Political stability*	53.4	92	
1.1.2	Government effectiveness*	29.4	93	
1.2	Regulatory environment	62.1	82	
1.2.1	Regulatory quality*	38.2	100	
1.2.2	Rule of law*	36.4	85	
1.2.3	Cost of redundancy dismissal, salary weeks	14.6	62	●
1.3	Business environment	65.0	84	
1.3.1	Ease of starting a business*	73.5	116	
1.3.2	Ease of resolving insolvency*	45.8	75	
1.3.3	Ease of paying taxes*	75.8	59	●
2	**Human capital & research**	**22.8**	**96**	
2.1	Education	51.1	47	●
2.1.1	Expenditure on education, % GDP	7.8	8	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	38.7	7	●
2.1.3	School life expectancy, years◴	11.3	100	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	16.3	72	
2.2	Tertiary education	17.3	107	
2.2.1	Tertiary enrolment, % gross	5.3	123	○
2.2.2	Graduates in science & engineering, %	16.8	70	
2.2.3	Tertiary inbound mobility, %	0.5	95	
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**17.1**	**138**	○
3.1	Information & communication technologies (ICTs)	17.3	126	
3.1.1	ICT access*	30.2	117	
3.1.2	ICT use*	9.9	111	
3.1.3	Government's online service*	13.4	131	○
3.1.4	E-participation*	15.7	126	○
3.2	General infrastructure	7.2	140	○
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	n/a	n/a	
3.2.3	Gross capital formation, % GDP	11.5	137	○
3.3	Ecological sustainability	26.8	113	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	37.4	115	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.7	73	●
4	**Market sophistication**	**39.6**	**113**	
4.1	Credit	27.2	81	
4.1.1	Ease of getting credit*	55.0	56	●
4.1.2	Domestic credit to private sector, % GDP	25.3	109	
4.1.3	Microfinance gross loans, % GDP◴	1.6	31	●
4.2	Investment	24.7	126	
4.2.1	Ease of protecting investors*	47.5	97	
4.2.2	Market capitalization, % GDP◴	6.7	95	
4.2.3	Total value of stocks traded, % GDP◴	0.0	109	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	67.0	107	
4.3.1	Applied tariff rate, weighted mean, %	7.0	102	
4.3.2	Intensity of local competition†	58.4	111	
5	**Business sophistication**	**42.9**	**34**	
5.1	Knowledge workers	62.8	15	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	51.0	26	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	34.6	61	●
5.2.1	University/industry research collaboration†	39.1	82	
5.2.2	State of cluster development†	39.5	97	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.1	36	●
5.3	Knowledge absorption	31.2	82	
5.3.1	Royalty & license fees payments, % total trade◴	2.0	7	●
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.2	119	○
5.3.4	FDI net inflows, % GDP	1.8	92	
6	**Knowledge & technology outputs**	**9.7**	**136**	○
6.1	Knowledge creation	3.5	122	
6.1.1	Domestic resident patent app./bn PPP$ GDP◴	0.4	80	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	3.8	109	
6.1.5	Citable documents H index	35.0	131	○
6.2	Knowledge impact	4.1	134	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	2.0	92	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	21.4	106	
6.3.1	Royalty & license fees receipts, % total trade◴	0.1	67	
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade◴	0.4	104	
6.3.4	FDI net outflows, % GDP	0.0	99	
7	**Creative outputs**	**20.4**	**120**	
7.1	Intangible assets	38.4	98	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	38.9	123	○
7.1.4	ICTs & organizational model creation†	37.8	123	○
7.2	Creative goods & services	4.2	116	
7.2.1	Cultural & creative services exports, % total trade◴	0.1	62	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	0.6	116	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.6	112	
7.3.2	Country-code TLDs/th pop. 15–69	0.6	96	
7.3.3	Wikipedia edits/pop. 15–69	64.0	117	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Sweden

Key indicators

Population (millions)	9.6
GDP (US$ billions)	570.1
GDP per capita, PPP$	42,624.1
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**62.4**	**3**	●
Innovation Output Sub-Index		57.8	4	●
Innovation Input Sub-Index		67.0	7	
Innovation Efficiency Ratio		0.9	16	
Global Innovation Index 2014 (out of 143)		62.3	3	
1	**Institutions**	**90.0**	**9**	
1.1	Political environment	92.3	6	●
1.1.1	Political stability*	92.0	11	
1.1.2	Government effectiveness*	92.5	4	●
1.2	Regulatory environment	93.1	13	
1.2.1	Regulatory quality*	98.1	3	●
1.2.2	Rule of law*	99.6	2	●
1.2.3	Cost of redundancy dismissal, salary weeks	14.4	61	○
1.3	Business environment	84.7	17	
1.3.1	Ease of starting a business*	92.3	28	
1.3.2	Ease of resolving insolvency*	78.4	16	
1.3.3	Ease of paying taxes*	83.3	31	
2	**Human capital & research**	**61.7**	**4**	●
2.1	Education	58.2	13	
2.1.1	Expenditure on education, % GDP	6.8	15	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	32.7	18	
2.1.3	School life expectancy, years	15.8	26	
2.1.4	PISA scales in reading, maths, & science	482.1	34	○
2.1.5	Pupil-teacher ratio, secondary	9.5	22	
2.2	Tertiary education	49.2	21	
2.2.1	Tertiary enrolment, % gross	70.0	25	
2.2.2	Graduates in science & engineering, %	27.2	16	
2.2.3	Tertiary inbound mobility, %	6.3	27	
2.3	Research & development (R&D)	77.6	4	●
2.3.1	Researchers, FTE/mn pop.	6508.5	6	
2.3.2	Gross expenditure on R&D, % GDP	3.4	5	●
2.3.3	QS university ranking, average score top 3*	73.5	13	
3	**Infrastructure**	**62.8**	**7**	
3.1	Information & communication technologies (ICTs)	75.8	18	
3.1.1	ICT access*	89.3	9	
3.1.2	ICT use*	82.9	2	●
3.1.3	Government's online service*	70.1	28	
3.1.4	E-participation*	60.8	45	
3.2	General infrastructure	55.5	11	
3.2.1	Electricity output, kWh/cap	15884.2	7	
3.2.2	Logistics performance*	91.8	6	●
3.2.3	Gross capital formation, % GDP	19.2	98	○
3.3	Ecological sustainability	57.0	12	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.0	63	○
3.3.2	Environmental performance*	78.1	9	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	8.5	9	
4	**Market sophistication**	**63.7**	**14**	
4.1	Credit	49.6	25	
4.1.1	Ease of getting credit*	55.0	56	○
4.1.2	Domestic credit to private sector, % GDP	135.3	17	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	56.5	15	
4.2.1	Ease of protecting investors*	63.3	31	
4.2.2	Market capitalization, % GDP	103.1	14	
4.2.3	Total value of stocks traded, % GDP	69.2	10	
4.2.4	Venture capital deals/tr PPP$ GDP	0.3	13	
4.3	Trade & competition	85.1	28	
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	73.5	39	
5	**Business sophistication**	**56.9**	**7**	
5.1	Knowledge workers	76.8	2	●
5.1.1	Knowledge-intensive employment, %	49.4	4	●
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	2.4	5	
5.1.4	GERD financed by business, %	61.0	8	
5.1.5	Females employed w/advanced degrees, % total	23.3	10	
5.2	Innovation linkages	45.5	23	
5.2.1	University/industry research collaboration†	72.1	11	
5.2.2	State of cluster development†	62.3	19	
5.2.3	GERD financed by abroad, %	6.8	56	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	27	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	1.9	9	
5.3	Knowledge absorption	48.5	16	
5.3.1	Royalty & license fees payments, % total trade	1.0	33	
5.3.2	High-tech imports less re-imports, % total trade	9.2	46	
5.3.3	Comm., computer & info. services imp., % total trade	2.8	6	●
5.3.4	FDI net inflows, % GDP	-0.9	136	○
6	**Knowledge & technology outputs**	**60.5**	**2**	●
6.1	Knowledge creation	70.6	2	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	5.4	19	
6.1.2	PCT resident patent app./bn PPP$ GDP	8.8	1	●
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	53.7	6	●
6.1.5	Citable documents H index	567.0	11	
6.2	Knowledge impact	47.7	28	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.4	65	○
6.2.2	New businesses/th pop. 15–64	6.4	19	
6.2.3	Computer software spending, % GDP	0.6	15	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	10.7	39	
6.2.5	High- & medium-high-tech manufactures, %	31.8	34	
6.3	Knowledge diffusion	63.0	6	●
6.3.1	Royalty & license fees receipts, % total trade	2.6	7	
6.3.2	High-tech exports less re-exports, % total trade	9.4	22	
6.3.3	Comm., computer & info. services exp., % total trade	4.7	8	
6.3.4	FDI net outflows, % GDP	3.5	18	
7	**Creative outputs**	**55.1**	**11**	
7.1	Intangible assets	56.2	22	
7.1.1	Domestic res trademark app./bn PPP$ GDP	52.9	44	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.6	19	
7.1.3	ICTs & business model creation†	76.1	6	●
7.1.4	ICTs & organizational model creation†	73.4	10	
7.2	Creative goods & services	37.4	23	
7.2.1	Cultural & creative services exports, % total trade	0.8	24	
7.2.2	National feature films/mn pop. 15–69	9.1	18	
7.2.3	Global ent. & media output/th pop. 15–69	65.5	5	
7.2.4	Printing & publishing output manufactures, %	1.4	55	○
7.2.5	Creative goods exports, % total trade	1.8	24	
7.3	Online creativity	70.6	9	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	50.3	18	
7.3.2	Country-code TLDs/th pop. 15–69	84.2	10	
7.3.3	Wikipedia edits/pop. 15–69	7625.1	12	
7.3.4	Video uploads on YouTube/pop. 15–69	91.4	13	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Switzerland

Key indicators

Population (millions)	8.2
GDP (US$ billions)	712.1
GDP per capita, PPP$	47,863.0
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**68.3**	**1**	●
Innovation Output Sub-Index		68.6	1	●
Innovation Input Sub-Index		68.0	2	●
Innovation Efficiency Ratio		1.0	2	●
Global Innovation Index 2014 (out of 143)		64.8	1	
1	**Institutions**	**89.6**	**10**	
1.1	Political environment	94.2	5	
1.1.1	Political stability*	98.1	2	●
1.1.2	Government effectiveness*	90.2	6	
1.2	Regulatory environment	94.5	11	
1.2.1	Regulatory quality*	91.3	13	
1.2.2	Rule of law*	95.3	8	
1.2.3	Cost of redundancy dismissal, salary weeks	10.1	37	
1.3	Business environment	80.2	28	
1.3.1	Ease of starting a business*	88.4	59	○
1.3.2	Ease of resolving insolvency*	63.1	39	
1.3.3	Ease of paying taxes*	89.1	17	
2	**Human capital & research**	**59.2**	**6**	
2.1	Education	55.5	28	
2.1.1	Expenditure on education, % GDP	5.3	44	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	27.5	29	
2.1.3	School life expectancy, years	15.8	27	
2.1.4	PISA scales in reading, maths, & science	518.4	11	
2.1.5	Pupil-teacher ratio, secondary	9.3	21	
2.2	Tertiary education	49.8	19	
2.2.1	Tertiary enrolment, % gross	55.6	45	
2.2.2	Graduates in science & engineering, %◴	20.8	50	○
2.2.3	Tertiary inbound mobility, %	16.5	9	
2.3	Research & development (R&D)	72.4	7	
2.3.1	Researchers, FTE/mn pop.◴	4495.2	12	
2.3.2	Gross expenditure on R&D, % GDP◴	3.1	6	
2.3.3	QS university ranking, average score top 3*	89.0	3	●
3	**Infrastructure**	**58.6**	**15**	
3.1	Information & communication technologies (ICTs)	62.2	41	
3.1.1	ICT access*	93.6	2	●
3.1.2	ICT use*	67.5	18	
3.1.3	Government's online service*	50.4	64	○
3.1.4	E-participation*	37.3	87	○
3.2	General infrastructure	46.6	26	
3.2.1	Electricity output, kWh/cap	8540.3	19	
3.2.2	Logistics performance*	85.8	14	
3.2.3	Gross capital formation, % GDP	21.1	73	○
3.3	Ecological sustainability	67.1	2	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	12.0	14	
3.3.2	Environmental performance*	87.7	1	●
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	6.6	15	
4	**Market sophistication**	**72.3**	**5**	
4.1	Credit	57.8	15	
4.1.1	Ease of getting credit*	60.0	48	○
4.1.2	Domestic credit to private sector, % GDP	169.0	9	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	71.6	4	
4.2.1	Ease of protecting investors*	55.0	72	○
4.2.2	Market capitalization, % GDP	162.0	1	●
4.2.3	Total value of stocks traded, % GDP	96.2	4	
4.2.4	Venture capital deals/tr PPP$ GDP	0.6	7	
4.3	Trade & competition	87.6	14	
4.3.1	Applied tariff rate, weighted mean, %◴	1.0	7	
4.3.2	Intensity of local competition†	78.5	17	
5	**Business sophistication**	**60.0**	**3**	●
5.1	Knowledge workers	73.0	4	
5.1.1	Knowledge-intensive employment, %	51.0	3	●
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	2.2	6	
5.1.4	GERD financed by business, %◴	60.8	10	
5.1.5	Females employed w/advanced degrees, % total	17.0	30	
5.2	Innovation linkages	56.8	7	
5.2.1	University/industry research collaboration†	79.8	3	●
5.2.2	State of cluster development†	72.5	5	
5.2.3	GERD financed by abroad, %◴	12.1	37	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	12	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	3.3	4	
5.3	Knowledge absorption	50.1	14	
5.3.1	Royalty & license fees payments, % total trade◴	8.4	1	●
5.3.2	High-tech imports less re-imports, % total trade	9.9	32	
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	-1.3	137	○
6	**Knowledge & technology outputs**	**72.4**	**1**	●
6.1	Knowledge creation	69.2	3	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	3.3	28	
6.1.2	PCT resident patent app./bn PPP$ GDP	8.7	1	●
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	55.7	4	
6.1.5	Citable documents H index	629.0	9	
6.2	Knowledge impact	57.8	5	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.4	86	○
6.2.2	New businesses/th pop. 15–64	2.5	41	○
6.2.3	Computer software spending, % GDP	0.8	2	●
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	26.3	13	
6.2.5	High- & medium-high-tech manufactures, %◴	64.0	2	●
6.3	Knowledge diffusion	90.3	1	●
6.3.1	Royalty & license fees receipts, % total trade◴	7.2	1	●
6.3.2	High-tech exports less re-exports, % total trade	17.1	7	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	8.3	6	
7	**Creative outputs**	**64.8**	**3**	●
7.1	Intangible assets	65.8	6	
7.1.1	Domestic res trademark app./bn PPP$ GDP	76.3	21	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	6.6	1	●
7.1.3	ICTs & business model creation†	74.0	13	
7.1.4	ICTs & organizational model creation†	64.0	25	
7.2	Creative goods & services	52.6	3	●
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	17.5	9	
7.2.3	Global ent. & media output/th pop. 15–69	79.0	2	●
7.2.4	Printing & publishing output manufactures, %◴	1.7	37	
7.2.5	Creative goods exports, % total trade	4.0	11	
7.3	Online creativity	75.2	5	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	75.4	11	
7.3.2	Country-code TLDs/th pop. 15–69	100.0	1	●
7.3.3	Wikipedia edits/pop. 15–69	4555.6	32	
7.3.4	Video uploads on YouTube/pop. 15–69	91.7	12	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Tajikistan

Key indicators

Population (millions)	8.4
GDP (US$ billions)	9.2
GDP per capita, PPP$	2,486.0
Income group	Low income
Region	Central and Southern Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**27.5**	**114**	
Innovation Output Sub-Index		21.5	106	
Innovation Input Sub-Index		33.4	115	
Innovation Efficiency Ratio		0.6	101	
Global Innovation Index 2014 (out of 143)		23.7	137	
1	**Institutions**	**42.7**	**127**	
1.1	Political environment	24.2	130	
1.1.1	Political stability*	36.0	119	
1.1.2	Government effectiveness*	12.3	132	
1.2	Regulatory environment	51.0	112	
1.2.1	Regulatory quality*	19.4	131	
1.2.2	Rule of law*	14.7	136	○
1.2.3	Cost of redundancy dismissal, salary weeks	15.5	69	
1.3	Business environment	52.8	128	
1.3.1	Ease of starting a business*	83.0	86	
1.3.2	Ease of resolving insolvency*	29.3	126	
1.3.3	Ease of paying taxes*	46.1	128	
2	**Human capital & research**	**25.5**	**86**	
2.1	Education	43.4	75	
2.1.1	Expenditure on education, % GDP	4.0	86	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	11.2	103	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	15.4	66	
2.2	Tertiary education	32.0	70	
2.2.1	Tertiary enrolment, % gross	22.5	88	
2.2.2	Graduates in science & engineering, %	25.5	21	●
2.2.3	Tertiary inbound mobility, %	1.6	73	
2.3	Research & development (R&D)	1.2	112	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	0.1	104	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**18.0**	**135**	○
3.1	Information & communication technologies (ICTs)	9.0	138	○
3.1.1	ICT access*	n/a	n/a	
3.1.2	ICT use*	n/a	n/a	
3.1.3	Government's online service*	6.3	137	○
3.1.4	E-participation*	11.8	132	○
3.2	General infrastructure	12.2	136	○
3.2.1	Electricity output, kWh/cap	2119.1	76	
3.2.2	Logistics performance*	18.7	105	
3.2.3	Gross capital formation, % GDP	12.6	136	○
3.3	Ecological sustainability	32.7	88	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	7.3	59	●
3.3.2	Environmental performance*	31.3	125	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	4.7	22	●
4	**Market sophistication**	**53.3**	**40**	●
4.1	Credit	33.1	61	●
4.1.1	Ease of getting credit*	35.0	102	
4.1.2	Domestic credit to private sector, % GDP	17.9	119	
4.1.3	Microfinance gross loans, % GDP	5.0	8	●
4.2	Investment	58.3	12	
4.2.1	Ease of protecting investors*	58.3	54	●
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	68.5	100	
4.3.1	Applied tariff rate, weighted mean, %	5.2	86	
4.3.2	Intensity of local competition†	55.3	117	
5	**Business sophistication**	**27.4**	**108**	
5.1	Knowledge workers	27.3	99	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms	33.6	55	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %◴	1.6	82	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	24.8	101	
5.2.1	University/industry research collaboration†	37.9	88	
5.2.2	State of cluster development†	38.6	103	
5.2.3	GERD financed by abroad, %	0.2	98	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	26	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	30.1	92	
5.3.1	Royalty & license fees payments, % total trade◴	0.0	124	○
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade◴	1.1	54	●
5.3.4	FDI net inflows, % GDP	1.3	104	
6	**Knowledge & technology outputs**	**26.1**	**70**	
6.1	Knowledge creation	21.3	46	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.1	100	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	3.2	10	●
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.1	126	
6.1.5	Citable documents H index	24.0	137	○
6.2	Knowledge impact	33.7	91	
6.2.1	Growth rate of PPP$ GDP/worker, %	4.5	12	●
6.2.2	New businesses/th pop. 15–64	0.3	95	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.2	136	○
6.2.5	High- & medium-high-tech manufactures, %◴	2.4	95	
6.3	Knowledge diffusion	23.2	98	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	89	
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade◴	2.6	26	●
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**17.0**	**130**	
7.1	Intangible assets	30.3	127	
7.1.1	Domestic res trademark app./bn PPP$ GDP	12.0	94	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.0	61	
7.1.3	ICTs & business model creation†	51.2	87	
7.1.4	ICTs & organizational model creation†	48.9	81	
7.2	Creative goods & services	7.0	111	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	1.8	60	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	0.6	89	
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	0.4	117	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.1	133	○
7.3.2	Country-code TLDs/th pop. 15–69	0.6	101	
7.3.3	Wikipedia edits/pop. 15–69	97.5	115	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Tanzania, United Republic of

Key indicators

Population (millions)	50.8
GDP (US$ billions)	47.9
GDP per capita, PPP$	1,812.7
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**27.0**	**117**	
Innovation Output Sub-Index		23.6	95	
Innovation Input Sub-Index		30.5	124	
Innovation Efficiency Ratio		0.8	38	●
Global Innovation Index 2014 (out of 143)		25.6	123	
1	**Institutions**	**56.1**	**83**	
1.1	Political environment	41.8	93	
1.1.1	Political stability*	60.4	76	
1.1.2	Government effectiveness*	23.2	110	
1.2	Regulatory environment	66.9	67	●
1.2.1	Regulatory quality*	38.7	95	
1.2.2	Rule of law*	34.2	90	
1.2.3	Cost of redundancy dismissal, salary weeks	9.3	29	●
1.3	Business environment	59.6	105	
1.3.1	Ease of starting a business*	78.9	101	
1.3.2	Ease of resolving insolvency*	41.1	97	
1.3.3	Ease of paying taxes*	59.0	114	
2	**Human capital & research**	**12.9**	**133**	○
2.1	Education	31.1	116	
2.1.1	Expenditure on education, % GDP◴	6.2	28	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	16.2	77	
2.1.3	School life expectancy, years	9.2	119	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	26.4	99	
2.2	Tertiary education	2.7	136	○
2.2.1	Tertiary enrolment, % gross	3.9	129	○
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %◴	0.6	88	
2.3	Research & development (R&D)	5.1	82	
2.3.1	Researchers, FTE/mn pop.◴	35.6	99	○
2.3.2	Gross expenditure on R&D, % GDP◴	0.5	61	
2.3.3	QS university ranking, average score top 3*	2.8	71	●
3	**Infrastructure**	**23.8**	**120**	
3.1	Information & communication technologies (ICTs)	23.8	115	
3.1.1	ICT access*	23.7	129	○
3.1.2	ICT use*	2.4	129	○
3.1.3	Government's online service*	29.9	106	
3.1.4	E-participation*	39.2	82	
3.2	General infrastructure	27.6	83	
3.2.1	Electricity output, kWh/cap	121.3	120	○
3.2.2	Logistics performance*	8.7	122	○
3.2.3	Gross capital formation, % GDP	31.5	18	●
3.3	Ecological sustainability	20.0	134	○
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	3.1	114	
3.3.2	Environmental performance*	36.2	120	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	101	
4	**Market sophistication**	**33.6**	**136**	○
4.1	Credit	25.0	88	
4.1.1	Ease of getting credit*	25.0	125	
4.1.2	Domestic credit to private sector, % GDP	17.2	121	
4.1.3	Microfinance gross loans, % GDP	3.8	15	●
4.2	Investment	18.5	139	○
4.2.1	Ease of protecting investors*	43.3	119	
4.2.2	Market capitalization, % GDP	6.4	97	
4.2.3	Total value of stocks traded, % GDP	0.1	99	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	56	
4.3	Trade & competition	57.4	133	○
4.3.1	Applied tariff rate, weighted mean, %	11.5	127	
4.3.2	Intensity of local competition†	55.3	118	
5	**Business sophistication**	**25.8**	**120**	
5.1	Knowledge workers	13.4	133	○
5.1.1	Knowledge-intensive employment, %◴	2.6	115	○
5.1.2	Firms offering formal training, % firms	30.7	64	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %◴	0.1	91	○
5.1.5	Females employed w/advanced degrees, % total	0.7	85	○
5.2	Innovation linkages	38.8	45	●
5.2.1	University/industry research collaboration†	39.5	80	
5.2.2	State of cluster development†	40.3	95	
5.2.3	GERD financed by abroad, %◴	42.0	10	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	71	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	25.2	114	
5.3.1	Royalty & license fees payments, % total trade	0.0	117	
5.3.2	High-tech imports less re-imports, % total trade	6.8	68	
5.3.3	Comm., computer & info. services imp., % total trade	0.5	97	
5.3.4	FDI net inflows, % GDP	5.6	28	●
6	**Knowledge & technology outputs**	**17.4**	**117**	
6.1	Knowledge creation	9.8	70	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	6.8	83	
6.1.5	Citable documents H index	102.0	70	●
6.2	Knowledge impact	38.4	64	●
6.2.1	Growth rate of PPP$ GDP/worker, %	3.7	18	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.5	126	
6.2.5	High- & medium-high-tech manufactures, %◴	0.1	101	○
6.3	Knowledge diffusion	4.2	132	○
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.5	77	
6.3.3	Comm., computer & info. services exp., % total trade◴	0.4	96	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**29.7**	**81**	
7.1	Intangible assets	44.9	71	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	45.7	110	
7.1.4	ICTs & organizational model creation†	44.2	99	
7.2	Creative goods & services	28.7	42	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	3.4	9	●
7.2.5	Creative goods exports, % total trade	0.1	95	
7.3	Online creativity	0.2	128	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.2	126	
7.3.2	Country-code TLDs/th pop. 15–69	0.1	117	
7.3.3	Wikipedia edits/pop. 15–69	38.6	125	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

The Former Yugoslav Republic of Macedonia

Key indicators

Population (millions)	2.1
GDP (US$ billions)	11.3
GDP per capita, PPP$	11,395.3
Income group	Upper-middle income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**38.0**	**56**	
Innovation Output Sub-Index		32.1	55	
Innovation Input Sub-Index		44.0	56	
Innovation Efficiency Ratio		0.7	64	
Global Innovation Index 2014 (out of 143)		36.9	60	
1	**Institutions**	**67.7**	**55**	
1.1	Political environment	47.3	77	
1.1.1	Political stability*	54.9	87	
1.1.2	Government effectiveness*	39.7	71	
1.2	Regulatory environment	69.8	55	
1.2.1	Regulatory quality*	56.4	59	
1.2.2	Rule of law*	42.3	70	
1.2.3	Cost of redundancy dismissal, salary weeks	13.0	50	
1.3	Business environment	86.1	15	●
1.3.1	Ease of starting a business*	98.1	3	●
1.3.2	Ease of resolving insolvency*	65.9	33	●
1.3.3	Ease of paying taxes*	94.2	7	●
2	**Human capital & research**	**32.7**	**55**	
2.1	Education	66.2	5	
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	13.4	74	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	10.5	31	
2.2	Tertiary education	28.8	78	
2.2.1	Tertiary enrolment, % gross	38.5	67	
2.2.2	Graduates in science & engineering, %	19.1	60	
2.2.3	Tertiary inbound mobility, %	2.2	65	
2.3	Research & development (R&D)	3.0	93	
2.3.1	Researchers, FTE/mn pop.◴	331.1	65	
2.3.2	Gross expenditure on R&D, % GDP◴	0.2	85	○
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**31.4**	**94**	
3.1	Information & communication technologies (ICTs)	38.4	88	
3.1.1	ICT access*	65.5	56	
3.1.2	ICT use*	42.2	54	
3.1.3	Government's online service*	24.4	113	○
3.1.4	E-participation*	21.6	119	○
3.2	General infrastructure	16.3	126	○
3.2.1	Electricity output, kWh/cap	2967.8	63	
3.2.2	Logistics performance*	17.2	108	○
3.2.3	Gross capital formation, % GDP	n/a	n/a	
3.3	Ecological sustainability	39.6	60	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.6	76	
3.3.2	Environmental performance*	50.4	79	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	5.0	20	●
4	**Market sophistication**	**52.3**	**46**	
4.1	Credit	39.1	46	
4.1.1	Ease of getting credit*	65.0	34	
4.1.2	Domestic credit to private sector, % GDP	49.2	68	
4.1.3	Microfinance gross loans, % GDP	3.1	17	●
4.2	Investment	34.2	75	
4.2.1	Ease of protecting investors*	66.7	21	●
4.2.2	Market capitalization, % GDP	5.8	99	○
4.2.3	Total value of stocks traded, % GDP	0.3	84	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	83.4	35	
4.3.1	Applied tariff rate, weighted mean, %	1.9	44	
4.3.2	Intensity of local competition†	73.2	41	
5	**Business sophistication**	**35.9**	**62**	
5.1	Knowledge workers	40.0	64	
5.1.1	Knowledge-intensive employment, %	27.9	50	
5.1.2	Firms offering formal training, % firms	46.0	35	
5.1.3	GERD performed by business, % of GDP◴	0.0	75	○
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	11.4	56	
5.2	Innovation linkages	31.8	66	
5.2.1	University/industry research collaboration†	45.2	58	
5.2.2	State of cluster development†	41.0	92	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	108	○
5.3	Knowledge absorption	35.8	59	
5.3.1	Royalty & license fees payments, % total trade	0.6	48	
5.3.2	High-tech imports less re-imports, % total trade	6.1	80	
5.3.3	Comm., computer & info. services imp., % total trade	1.6	35	
5.3.4	FDI net inflows, % GDP	3.7	45	
6	**Knowledge & technology outputs**	**26.3**	**69**	
6.1	Knowledge creation	9.6	73	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.6	52	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	57	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	12.6	62	
6.1.5	Citable documents H index	67.0	98	○
6.2	Knowledge impact	40.1	54	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.1	70	
6.2.2	New businesses/th pop. 15–64	3.6	33	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	15.2	25	●
6.2.5	High- & medium-high-tech manufactures, %	19.6	58	
6.3	Knowledge diffusion	29.0	63	
6.3.1	Royalty & license fees receipts, % total trade	0.1	47	
6.3.2	High-tech exports less re-exports, % total trade	1.9	51	
6.3.3	Comm., computer & info. services exp., % total trade	2.5	28	●
6.3.4	FDI net outflows, % GDP	0.4	69	
7	**Creative outputs**	**37.9**	**46**	
7.1	Intangible assets	48.9	52	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.6	38	
7.1.3	ICTs & business model creation†	60.1	50	
7.1.4	ICTs & organizational model creation†	54.9	60	
7.2	Creative goods & services	27.3	47	
7.2.1	Cultural & creative services exports, % total trade	0.7	30	
7.2.2	National feature films/mn pop. 15–69	8.2	22	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	2.6	16	●
7.2.5	Creative goods exports, % total trade	0.2	80	
7.3	Online creativity	26.5	50	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	7.2	52	
7.3.2	Country-code TLDs/th pop. 15–69	1.9	72	
7.3.3	Wikipedia edits/pop. 15–69	3131.7	43	
7.3.4	Video uploads on YouTube/pop. 15–69	73.7	48	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Thailand

Key indicators

Population (millions)	67.2
GDP (US$ billions)	373.8
GDP per capita, PPP$	10,226.8
Income group	Upper-middle income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**38.1**	**55**	
Innovation Output Sub-Index		33.0	50	
Innovation Input Sub-Index		43.2	62	
Innovation Efficiency Ratio		0.8	43	
Global Innovation Index 2014 (out of 143)		39.3	48	
1	**Institutions**	**53.6**	**92**	
1.1	Political environment	39.3	103	
1.1.1	Political stability*	31.5	131	○
1.1.2	Government effectiveness*	47.1	57	
1.2	Regulatory environment	46.7	119	○
1.2.1	Regulatory quality*	53.5	64	
1.2.2	Rule of law*	44.1	65	
1.2.3	Cost of redundancy dismissal, salary weeks	36.0	132	○
1.3	Business environment	74.9	48	
1.3.1	Ease of starting a business*	88.0	63	
1.3.2	Ease of resolving insolvency*	58.7	43	
1.3.3	Ease of paying taxes*	78.0	51	
2	**Human capital & research**	**31.1**	**60**	
2.1	Education	51.1	45	
2.1.1	Expenditure on education, % GDP	7.6	9	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	37.4	10	●
2.1.3	School life expectancy, years	13.5	71	
2.1.4	PISA scales in reading, maths, & science	437.3	44	
2.1.5	Pupil-teacher ratio, secondary◴	19.9	84	
2.2	Tertiary education	23.5	93	
2.2.1	Tertiary enrolment, % gross	51.2	51	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	0.8	86	
2.3	Research & development (R&D)	18.5	48	
2.3.1	Researchers, FTE/mn pop.◴	546.1	57	
2.3.2	Gross expenditure on R&D, % GDP◴	0.4	70	
2.3.3	QS university ranking, average score top 3*	40.2	36	
3	**Infrastructure**	**40.7**	**64**	
3.1	Information & communication technologies (ICTs)	44.7	73	
3.1.1	ICT access*	48.8	79	
3.1.2	ICT use*	31.2	66	
3.1.3	Government's online service*	44.1	74	
3.1.4	E-participation*	54.9	54	
3.2	General infrastructure	39.8	40	
3.2.1	Electricity output, kWh/cap	2494.7	70	
3.2.2	Logistics performance*	64.7	34	
3.2.3	Gross capital formation, % GDP	27.0	36	
3.3	Ecological sustainability	37.5	71	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.4	84	
3.3.2	Environmental performance*	52.8	70	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	3.3	29	
4	**Market sophistication**	**53.3**	**41**	
4.1	Credit	31.9	64	
4.1.1	Ease of getting credit*	45.0	80	
4.1.2	Domestic credit to private sector, % GDP	154.4	14	●
4.1.3	Microfinance gross loans, % GDP◴	0.0	90	○
4.2	Investment	49.6	30	
4.2.1	Ease of protecting investors*	65.8	25	
4.2.2	Market capitalization, % GDP	104.7	13	
4.2.3	Total value of stocks traded, % GDP	62.7	13	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	59	○
4.3	Trade & competition	78.3	62	
4.3.1	Applied tariff rate, weighted mean, %◴	4.9	81	
4.3.2	Intensity of local competition†	73.7	36	
5	**Business sophistication**	**37.3**	**54**	
5.1	Knowledge workers	47.3	39	
5.1.1	Knowledge-intensive employment, %	13.9	97	○
5.1.2	Firms offering formal training, % firms◴	75.3	2	●
5.1.3	GERD performed by business, % of GDP◴	0.2	49	
5.1.4	GERD financed by business, %◴	51.7	17	
5.1.5	Females employed w/advanced degrees, % total	7.5	70	○
5.2	Innovation linkages	25.6	96	
5.2.1	University/industry research collaboration†	49.2	44	
5.2.2	State of cluster development†	53.3	37	
5.2.3	GERD financed by abroad, %◴	2.5	77	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	47	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	90	○
5.3	Knowledge absorption	38.9	44	
5.3.1	Royalty & license fees payments, % total trade	1.6	12	●
5.3.2	High-tech imports less re-imports, % total trade	14.7	15	●
5.3.3	Comm., computer & info. services imp., % total trade	0.2	115	○
5.3.4	FDI net inflows, % GDP	3.3	55	
6	**Knowledge & technology outputs**	**30.3**	**48**	
6.1	Knowledge creation	15.6	57	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.6	51	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	67	
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.6	19	
6.1.4	Scientific & technical articles/bn PPP$ GDP	6.7	85	
6.1.5	Citable documents H index	190.0	38	
6.2	Knowledge impact	41.9	49	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.5	37	
6.2.2	New businesses/th pop. 15–64	0.9	75	
6.2.3	Computer software spending, % GDP	0.3	26	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	9.2	44	
6.2.5	High- & medium-high-tech manufactures, %◴	43.9	11	●
6.3	Knowledge diffusion	33.3	45	
6.3.1	Royalty & license fees receipts, % total trade	0.1	61	
6.3.2	High-tech exports less re-exports, % total trade	13.2	14	●
6.3.3	Comm., computer & info. services exp., % total trade	0.2	112	○
6.3.4	FDI net outflows, % GDP	1.7	37	
7	**Creative outputs**	**35.8**	**52**	
7.1	Intangible assets	43.0	83	
7.1.1	Domestic res trademark app./bn PPP$ GDP	28.9	72	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	61.2	44	
7.1.4	ICTs & organizational model creation†	52.7	66	
7.2	Creative goods & services	35.6	25	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69◴	1.0	76	
7.2.3	Global ent. & media output/th pop. 15–69	5.0	45	
7.2.4	Printing & publishing output manufactures, %◴	1.1	67	
7.2.5	Creative goods exports, % total trade	9.3	6	●
7.3	Online creativity	21.6	62	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	6.4	55	
7.3.2	Country-code TLDs/th pop. 15–69	0.5	102	
7.3.3	Wikipedia edits/pop. 15–69	944.0	77	
7.3.4	Video uploads on YouTube/pop. 15–69	72.5	54	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Togo

Key indicators

Population (millions)	7.0
GDP (US$ billions)	4.6
GDP per capita, PPP$	1,136.5
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**18.4**	**140**	○
Innovation Output Sub-Index		7.2	141	○
Innovation Input Sub-Index		29.6	128	
Innovation Efficiency Ratio		0.2	141	○
Global Innovation Index 2014 (out of 143)		17.6	142	
1	**Institutions**	**47.1**	**115**	
1.1	Political environment	29.0	121	
1.1.1	Political stability*	53.6	91	
1.1.2	Government effectiveness*	4.3	139	○
1.2	Regulatory environment	55.8	100	
1.2.1	Regulatory quality*	22.5	127	
1.2.2	Rule of law*	20.8	125	
1.2.3	Cost of redundancy dismissal, salary weeks	13.1	55	●
1.3	Business environment	56.7	112	
1.3.1	Ease of starting a business*	76.1	109	
1.3.2	Ease of resolving insolvency*	43.1	87	●
1.3.3	Ease of paying taxes*	50.8	124	
2	**Human capital & research**	**13.6**	**131**	
2.1	Education	32.0	108	
2.1.1	Expenditure on education, % GDP	4.0	87	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	15.4	85	
2.1.3	School life expectancy, years◴	12.2	91	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	26.2	98	
2.2	Tertiary education	7.0	130	
2.2.1	Tertiary enrolment, % gross	10.0	111	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %◴	1.4	75	
2.3	Research & development (R&D)	1.8	104	
2.3.1	Researchers, FTE/mn pop.◴	36.5	98	
2.3.2	Gross expenditure on R&D, % GDP◴	0.2	86	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**13.8**	**140**	○
3.1	Information & communication technologies (ICTs)	10.4	137	○
3.1.1	ICT access*	n/a	n/a	
3.1.2	ICT use*	n/a	n/a	
3.1.3	Government's online service*	11.0	134	○
3.1.4	E-participation*	9.8	133	○
3.2	General infrastructure	15.7	129	
3.2.1	Electricity output, kWh/cap	16.7	123	○
3.2.2	Logistics performance*	8.0	123	
3.2.3	Gross capital formation, % GDP	20.8	77	●
3.3	Ecological sustainability	15.3	140	○
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	2.4	118	○
3.3.2	Environmental performance*	27.9	132	○
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	113	
4	**Market sophistication**	**45.6**	**79**	●
4.1	Credit	29.8	77	●
4.1.1	Ease of getting credit*	30.0	113	
4.1.2	Domestic credit to private sector, % GDP	32.2	93	
4.1.3	Microfinance gross loans, % GDP	4.2	13	●
4.2	Investment	45.8	37	
4.2.1	Ease of protecting investors*	45.8	107	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	61.0	126	
4.3.1	Applied tariff rate, weighted mean, %	11.1	126	
4.3.2	Intensity of local competition†	n/a	n/a	
5	**Business sophistication**	**28.2**	**104**	
5.1	Knowledge workers	36.4	76	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms◴	31.0	63	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	15.2	135	○
5.2.1	University/industry research collaboration†	n/a	n/a	
5.2.2	State of cluster development†	n/a	n/a	
5.2.3	GERD financed by abroad, %◴	12.1	38	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	32.9	69	●
5.3.1	Royalty & license fees payments, % total trade◴	0.1	100	
5.3.2	High-tech imports less re-imports, % total trade	3.0	123	○
5.3.3	Comm., computer & info. services imp., % total trade◴	2.2	9	●
5.3.4	FDI net inflows, % GDP	1.9	88	
6	**Knowledge & technology outputs**	**13.9**	**126**	
6.1	Knowledge creation	6.0	96	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	6.7	84	●
6.1.5	Citable documents H index	33.0	133	
6.2	Knowledge impact	2.2	139	○
6.2.1	Growth rate of PPP$ GDP/worker, %	n/a	n/a	
6.2.2	New businesses/th pop. 15–64	0.1	100	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.8	95	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	33.6	44	●
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	109	
6.3.2	High-tech exports less re-exports, % total trade	0.0	118	
6.3.3	Comm., computer & info. services exp., % total trade◴	3.8	13	●
6.3.4	FDI net outflows, % GDP◴	2.4	28	●
7	**Creative outputs**	**0.5**	**141**	○
7.1	Intangible assets	n/a	n/a	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	n/a	n/a	
7.1.4	ICTs & organizational model creation†	n/a	n/a	
7.2	Creative goods & services	0.7	135	○
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade◴	0.0	115	
7.3	Online creativity	0.3	123	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.8	107	
7.3.2	Country-code TLDs/th pop. 15–69	0.0	141	○
7.3.3	Wikipedia edits/pop. 15–69	13.6	136	○
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Trinidad and Tobago

Key indicators

Population (millions)	1.3
GDP (US$ billions)	28.8
GDP per capita, PPP$	21,096.2
Income group	High income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**32.2**	**80**	
Innovation Output Sub-Index		25.6	88	
Innovation Input Sub-Index		38.8	86	
Innovation Efficiency Ratio		0.7	92	
Global Innovation Index 2014 (out of 143)		31.6	90	
1	**Institutions**	**63.0**	**62**	
1.1	Political environment	58.7	52	●
1.1.1	Political stability*	66.7	59	
1.1.2	Government effectiveness*	50.8	52	●
1.2	Regulatory environment	61.6	83	
1.2.1	Regulatory quality*	54.3	61	
1.2.2	Rule of law*	41.7	72	
1.2.3	Cost of redundancy dismissal, salary weeks	20.5	94	
1.3	Business environment	68.8	71	
1.3.1	Ease of starting a business*	88.3	60	
1.3.2	Ease of resolving insolvency*	49.0	63	
1.3.3	Ease of paying taxes*	69.0	89	
2	**Human capital & research**	**28.8**	**69**	
2.1	Education	46.3	63	
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years[d]	12.3	89	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	39.7	46	●
2.2.1	Tertiary enrolment, % gross[d]	12.0	106	
2.2.2	Graduates in science & engineering, %[d]	30.4	10	●
2.2.3	Tertiary inbound mobility, %[d]	5.8	30	●
2.3	Research & development (R&D)	0.4	119	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP[d]	0.0	113	○
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**28.4**	**106**	
3.1	Information & communication technologies (ICTs)	41.0	82	
3.1.1	ICT access*	63.6	59	
3.1.2	ICT use*	36.0	60	
3.1.3	Government's online service*	33.1	93	
3.1.4	E-participation*	31.4	101	
3.2	General infrastructure	20.2	118	
3.2.1	Electricity output, kWh/cap	6814.9	29	●
3.2.2	Logistics performance*	n/a	n/a	
3.2.3	Gross capital formation, % GDP	14.0	131	○
3.3	Ecological sustainability	24.0	123	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	1.8	122	○
3.3.2	Environmental performance*	52.3	71	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	104	
4	**Market sophistication**	**43.5**	**95**	
4.1	Credit	24.6	90	
4.1.1	Ease of getting credit*	65.0	34	●
4.1.2	Domestic credit to private sector, % GDP	31.1	97	
4.1.3	Microfinance gross loans, % GDP	0.0	88	○
4.2	Investment	38.8	57	●
4.2.1	Ease of protecting investors*	57.5	60	
4.2.2	Market capitalization, % GDP	64.7	27	●
4.2.3	Total value of stocks traded, % GDP	0.5	78	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	67.0	106	
4.3.1	Applied tariff rate, weighted mean, %[d]	10.0	121	
4.3.2	Intensity of local competition†	69.2	60	
5	**Business sophistication**	**30.3**	**93**	
5.1	Knowledge workers	31.0	91	
5.1.1	Knowledge-intensive employment, %	27.0	51	
5.1.2	Firms offering formal training, % firms[d]	28.0	70	
5.1.3	GERD performed by business, % of GDP[d]	0.0	86	○
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	31.6	68	
5.2.1	University/industry research collaboration†	35.6	103	
5.2.2	State of cluster development†	42.6	81	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP[d]	0.0	68	
5.3	Knowledge absorption	28.4	98	
5.3.1	Royalty & license fees payments, % total trade[d]	0.3	68	
5.3.2	High-tech imports less re-imports, % total trade	4.9	101	
5.3.3	Comm., computer & info. services imp., % total trade[d]	0.9	63	
5.3.4	FDI net inflows, % GDP	7.0	19	●
6	**Knowledge & technology outputs**	**24.4**	**81**	
6.1	Knowledge creation	3.8	115	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	89	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	3.7	111	
6.1.5	Citable documents H index	67.0	98	
6.2	Knowledge impact	42.4	48	●
6.2.1	Growth rate of PPP$ GDP/worker, %	2.2	40	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.3	109	
6.2.5	High- & medium-high-tech manufactures, %[d]	24.1	48	
6.3	Knowledge diffusion	27.0	73	
6.3.1	Royalty & license fees receipts, % total trade[d]	0.0	104	○
6.3.2	High-tech exports less re-exports, % total trade	0.0	120	○
6.3.3	Comm., computer & info. services exp., % total trade[d]	0.1	119	○
6.3.4	FDI net outflows, % GDP[d]	4.5	11	●
7	**Creative outputs**	**26.7**	**90**	
7.1	Intangible assets	46.0	65	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	44.6	113	
7.1.4	ICTs & organizational model creation†	47.4	91	
7.2	Creative goods & services	9.2	99	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %[d]	1.1	70	
7.2.5	Creative goods exports, % total trade[d]	0.1	100	
7.3	Online creativity	5.8	90	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	5.3	58	●
7.3.2	Country-code TLDs/th pop. 15–69	1.8	75	
7.3.3	Wikipedia edits/pop. 15–69	1399.1	70	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[d] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Tunisia

Key indicators

Population (millions)	11.1
GDP (US$ billions)	48.6
GDP per capita, PPP$	10,252.6
Income group	Upper-middle income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**33.5**	**76**	
Innovation Output Sub-Index		27.9	71	
Innovation Input Sub-Index		39.1	83	
Innovation Efficiency Ratio		0.7	71	
Global Innovation Index 2014 (out of 143)		32.9	78	
1	**Institutions**	**59.5**	**72**	
1.1	Political environment	41.5	95	
1.1.1	Political stability*	41.6	114	○
1.1.2	Government effectiveness*	41.4	68	
1.2	Regulatory environment	66.2	72	
1.2.1	Regulatory quality*	38.6	96	
1.2.2	Rule of law*	42.3	71	
1.2.3	Cost of redundancy dismissal, salary weeks	12.1	47	
1.3	Business environment	70.8	61	
1.3.1	Ease of starting a business*	83.6	81	
1.3.2	Ease of resolving insolvency*	54.7	52	
1.3.3	Ease of paying taxes*	74.1	64	
2	**Human capital & research**	**36.7**	**48**	
2.1	Education	46.7	61	
2.1.1	Expenditure on education, % GDP	6.2	27	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	24.4	41	
2.1.3	School life expectancy, years◴	14.6	47	
2.1.4	PISA scales in reading, maths, & science	396.6	56	○
2.1.5	Pupil-teacher ratio, secondary◴	13.6	48	
2.2	Tertiary education	52.5	15	●
2.2.1	Tertiary enrolment, % gross	35.2	70	
2.2.2	Graduates in science & engineering, %	42.4	3	●
2.2.3	Tertiary inbound mobility, %	0.5	93	○
2.3	Research & development (R&D)	10.9	67	
2.3.1	Researchers, FTE/mn pop.◴	1393.9	41	
2.3.2	Gross expenditure on R&D, % GDP◴	0.7	50	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**38.4**	**73**	
3.1	Information & communication technologies (ICTs)	50.0	58	
3.1.1	ICT access*	45.6	87	
3.1.2	ICT use*	25.9	80	
3.1.3	Government's online service*	63.8	39	●
3.1.4	E-participation*	64.7	33	●
3.2	General infrastructure	20.5	117	○
3.2.1	Electricity output, kWh/cap	1668.4	81	
3.2.2	Logistics performance*	19.9	102	
3.2.3	Gross capital formation, % GDP	20.6	80	
3.3	Ecological sustainability	44.7	45	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	10.3	21	●
3.3.2	Environmental performance*	59.0	49	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.7	52	
4	**Market sophistication**	**35.0**	**135**	○
4.1	Credit	20.5	113	○
4.1.1	Ease of getting credit*	35.0	102	
4.1.2	Domestic credit to private sector, % GDP	75.7	41	●
4.1.3	Microfinance gross loans, % GDP	0.2	56	
4.2	Investment	31.0	93	
4.2.1	Ease of protecting investors*	55.0	72	
4.2.2	Market capitalization, % GDP	19.6	70	
4.2.3	Total value of stocks traded, % GDP	2.8	56	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	53.4	135	○
4.3.1	Applied tariff rate, weighted mean, %◴	16.0	136	○
4.3.2	Intensity of local competition†	62.9	89	
5	**Business sophistication**	**25.9**	**119**	○
5.1	Knowledge workers	31.3	90	
5.1.1	Knowledge-intensive employment, %◴	20.9	70	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %◴	18.7	65	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	21.7	117	○
5.2.1	University/industry research collaboration†	32.0	114	○
5.2.2	State of cluster development†	41.8	85	
5.2.3	GERD financed by abroad, %◴	4.4	68	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP◴	0.0	80	
5.3	Knowledge absorption	24.7	117	○
5.3.1	Royalty & license fees payments, % total trade◴	0.1	110	○
5.3.2	High-tech imports less re-imports, % total trade	8.1	54	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.4	102	○
5.3.4	FDI net inflows, % GDP	2.3	74	
6	**Knowledge & technology outputs**	**23.3**	**87**	
6.1	Knowledge creation	13.8	62	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.9	63	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	70	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	25.4	35	●
6.1.5	Citable documents H index	97.0	73	
6.2	Knowledge impact	37.6	68	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.1	42	
6.2.2	New businesses/th pop. 15–64◴	1.5	55	
6.2.3	Computer software spending, % GDP	0.3	36	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	7.0	50	
6.2.5	High- & medium-high-tech manufactures, %◴	32.4	33	●
6.3	Knowledge diffusion	18.5	116	○
6.3.1	Royalty & license fees receipts, % total trade◴	0.1	55	
6.3.2	High-tech exports less re-exports, % total trade	3.3	40	●
6.3.3	Comm., computer & info. services exp., % total trade◴	1.6	56	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**32.4**	**71**	
7.1	Intangible assets	45.1	69	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	47.0	103	
7.1.4	ICTs & organizational model creation†	43.2	102	
7.2	Creative goods & services	23.1	57	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	1.0	75	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	0.7	82	○
7.2.5	Creative goods exports, % total trade	2.6	16	●
7.3	Online creativity	16.5	70	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.1	72	
7.3.2	Country-code TLDs/th pop. 15–69	0.3	109	
7.3.3	Wikipedia edits/pop. 15–69	499.9	92	
7.3.4	Video uploads on YouTube/pop. 15–69	58.9	63	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Turkey

Key indicators

Population (millions)	75.8
GDP (US$ billions)	806.1
GDP per capita, PPP$	15,767.3
Income group	Upper-middle income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**37.8**	**58**	
Innovation Output Sub-Index		33.9	46	
Innovation Input Sub-Index		41.7	71	
Innovation Efficiency Ratio		0.8	23	●
Global Innovation Index 2014 (out of 143)		38.2	54	
1	**Institutions**	**55.8**	**84**	
1.1	Political environment	43.0	88	
1.1.1	Political stability*	34.6	125	○
1.1.2	Government effectiveness*	51.3	50	
1.2	Regulatory environment	55.7	101	
1.2.1	Regulatory quality*	59.1	55	
1.2.2	Rule of law*	49.8	59	
1.2.3	Cost of redundancy dismissal, salary weeks	29.8	126	○
1.3	Business environment	68.9	67	
1.3.1	Ease of starting a business*	86.9	67	
1.3.2	Ease of resolving insolvency*	40.0	101	
1.3.3	Ease of paying taxes*	79.8	47	
2	**Human capital & research**	**35.9**	**50**	
2.1	Education	47.7	58	
2.1.1	Expenditure on education, % GDP[d]	2.9	111	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	14.5	49	
2.1.4	PISA scales in reading, maths, & science	462.3	40	
2.1.5	Pupil-teacher ratio, secondary	17.9	78	
2.2	Tertiary education	36.2	57	
2.2.1	Tertiary enrolment, % gross	69.4	26	●
2.2.2	Graduates in science & engineering, %	20.9	49	
2.2.3	Tertiary inbound mobility, %	0.9	85	
2.3	Research & development (R&D)	23.7	40	
2.3.1	Researchers, FTE/mn pop.	1188.7	45	
2.3.2	Gross expenditure on R&D, % GDP	0.9	37	
2.3.3	QS university ranking, average score top 3*	34.5	39	
3	**Infrastructure**	**41.0**	**63**	
3.1	Information & communication technologies (ICTs)	48.9	63	
3.1.1	ICT access*	58.3	67	
3.1.2	ICT use*	32.4	64	
3.1.3	Government's online service*	55.9	53	
3.1.4	E-participation*	49.0	64	
3.2	General infrastructure	33.9	59	
3.2.1	Electricity output, kWh/cap	3179.4	59	
3.2.2	Logistics performance*	68.3	29	●
3.2.3	Gross capital formation, % GDP	19.9	85	
3.3	Ecological sustainability	40.1	57	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	9.1	38	
3.3.2	Environmental performance*	54.9	60	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.2	57	
4	**Market sophistication**	**49.5**	**58**	
4.1	Credit	22.4	104	
4.1.1	Ease of getting credit*	45.0	80	
4.1.2	Domestic credit to private sector, % GDP	70.2	48	
4.1.3	Microfinance gross loans, % GDP	0.0	87	○
4.2	Investment	39.7	51	
4.2.1	Ease of protecting investors*	69.2	13	●
4.2.2	Market capitalization, % GDP	39.1	50	
4.2.3	Total value of stocks traded, % GDP	44.2	18	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	69	○
4.3	Trade & competition	86.4	18	●
4.3.1	Applied tariff rate, weighted mean, %[d]	2.7	55	
4.3.2	Intensity of local competition†	82.2	9	●
5	**Business sophistication**	**26.3**	**117**	
5.1	Knowledge workers	32.6	85	
5.1.1	Knowledge-intensive employment, %	19.2	76	
5.1.2	Firms offering formal training, % firms	28.4	67	
5.1.3	GERD performed by business, % of GDP	0.5	34	
5.1.4	GERD financed by business, %	48.9	21	●
5.1.5	Females employed w/advanced degrees, % total	7.4	71	
5.2	Innovation linkages	23.2	110	
5.2.1	University/industry research collaboration†	44.8	59	
5.2.2	State of cluster development†	54.7	34	
5.2.3	GERD financed by abroad, %	0.8	91	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	81	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	81	
5.3	Knowledge absorption	22.9	127	○
5.3.1	Royalty & license fees payments, % total trade	0.3	70	
5.3.2	High-tech imports less re-imports, % total trade	8.1	53	
5.3.3	Comm., computer & info. services imp., % total trade	0.1	120	○
5.3.4	FDI net inflows, % GDP	1.6	95	
6	**Knowledge & technology outputs**	**27.2**	**60**	
6.1	Knowledge creation	26.0	36	
6.1.1	Domestic resident patent app./bn PPP$ GDP	3.0	31	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.5	38	
6.1.3	Domestic res utility model app./bn PPP$ GDP	2.4	13	●
6.1.4	Scientific & technical articles/bn PPP$ GDP	17.2	44	
6.1.5	Citable documents H index	237.0	36	
6.2	Knowledge impact	35.3	83	
6.2.1	Growth rate of PPP$ GDP/worker, %	-0.6	106	○
6.2.2	New businesses/th pop. 15–64	0.8	78	
6.2.3	Computer software spending, % GDP	0.7	8	●
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	5.0	63	
6.2.5	High- & medium-high-tech manufactures, %[d]	28.2	42	
6.3	Knowledge diffusion	20.4	108	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	1.1	63	
6.3.3	Comm., computer & info. services exp., % total trade	0.2	115	○
6.3.4	FDI net outflows, % GDP	0.4	70	
7	**Creative outputs**	**40.6**	**37**	
7.1	Intangible assets	57.7	17	●
7.1.1	Domestic res trademark app./bn PPP$ GDP	130.5	5	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.9	34	
7.1.3	ICTs & business model creation†	62.1	42	
7.1.4	ICTs & organizational model creation†	56.2	56	
7.2	Creative goods & services	24.1	52	
7.2.1	Cultural & creative services exports, % total trade	0.5	35	
7.2.2	National feature films/mn pop. 15–69	1.6	63	
7.2.3	Global ent. & media output/th pop. 15–69	5.9	42	
7.2.4	Printing & publishing output manufactures, %[d]	1.1	68	
7.2.5	Creative goods exports, % total trade	2.6	17	●
7.3	Online creativity	23.0	59	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	14.7	36	
7.3.2	Country-code TLDs/th pop. 15–69	2.9	64	
7.3.3	Wikipedia edits/pop. 15–69	793.9	84	
7.3.4	Video uploads on YouTube/pop. 15–69	68.6	58	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[d] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Uganda

Key indicators

Population (millions)	38.8
GDP (US$ billions)	27.6
GDP per capita, PPP$	1,551.2
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**27.6**	**111**	
Innovation Output Sub-Index		20.1	113	
Innovation Input Sub-Index		35.2	102	
Innovation Efficiency Ratio		0.6	118	
Global Innovation Index 2014 (out of 143)		31.1	91	
1	**Institutions**	**54.3**	**90**	
1.1	Political environment	34.5	114	
1.1.1	Political stability*	43.4	112	
1.1.2	Government effectiveness*	25.7	105	
1.2	Regulatory environment	69.3	57	
1.2.1	Regulatory quality*	41.5	88	
1.2.2	Rule of law*	38.1	81	
1.2.3	Cost of redundancy dismissal, salary weeks	8.7	24	●
1.3	Business environment	59.0	109	
1.3.1	Ease of starting a business*	63.4	130	
1.3.2	Ease of resolving insolvency*	42.3	92	
1.3.3	Ease of paying taxes*	71.3	82	
2	**Human capital & research**	**18.3**	**109**	
2.1	Education	30.5	118	
2.1.1	Expenditure on education, % GDP	3.3	103	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	23.4	45	●
2.1.3	School life expectancy, years◴	9.8	117	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	21.3	88	
2.2	Tertiary education	19.9	102	
2.2.1	Tertiary enrolment, % gross◴	4.4	126	○
2.2.2	Graduates in science & engineering, %◴	9.5	98	○
2.2.3	Tertiary inbound mobility, %◴	10.7	15	●
2.3	Research & development (R&D)	4.5	84	
2.3.1	Researchers, FTE/mn pop.◴	37.2	97	
2.3.2	Gross expenditure on R&D, % GDP◴	0.6	57	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**26.3**	**113**	
3.1	Information & communication technologies (ICTs)	14.7	135	○
3.1.1	ICT access*	21.8	132	○
3.1.2	ICT use*	8.3	114	
3.1.3	Government's online service*	15.0	128	
3.1.4	E-participation*	13.7	129	○
3.2	General infrastructure	37.4	51	
3.2.1	Electricity output, kWh/cap	n/a	n/a	
3.2.2	Logistics performance*	n/a	n/a	
3.2.3	Gross capital formation, % GDP	25.4	42	●
3.3	Ecological sustainability	26.8	112	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	n/a	n/a	
3.3.2	Environmental performance*	39.2	112	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	107	
4	**Market sophistication**	**38.9**	**116**	
4.1	Credit	18.3	117	
4.1.1	Ease of getting credit*	30.0	113	
4.1.2	Domestic credit to private sector, % GDP	15.5	127	
4.1.3	Microfinance gross loans, % GDP	1.8	29	●
4.2	Investment	24.7	127	
4.2.1	Ease of protecting investors*	47.5	97	
4.2.2	Market capitalization, % GDP	36.4	52	
4.2.3	Total value of stocks traded, % GDP	0.1	103	○
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	39	
4.3	Trade & competition	73.6	83	
4.3.1	Applied tariff rate, weighted mean, %	6.7	98	
4.3.2	Intensity of local competition†	70.7	53	●
5	**Business sophistication**	**38.0**	**49**	●
5.1	Knowledge workers	17.8	126	
5.1.1	Knowledge-intensive employment, %	4.1	111	○
5.1.2	Firms offering formal training, % firms	34.3	54	
5.1.3	GERD performed by business, % of GDP◴	0.2	50	
5.1.4	GERD financed by business, %◴	13.7	67	
5.1.5	Females employed w/advanced degrees, % total	2.7	81	○
5.2	Innovation linkages	55.1	8	●
5.2.1	University/industry research collaboration†	44.7	60	
5.2.2	State of cluster development†	42.1	83	
5.2.3	GERD financed by abroad, %◴	57.3	3	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	41.3	36	●
5.3.1	Royalty & license fees payments, % total trade	0.2	82	
5.3.2	High-tech imports less re-imports, % total trade	7.5	59	
5.3.3	Comm., computer & info. services imp., % total trade	2.2	10	●
5.3.4	FDI net inflows, % GDP	5.3	31	●
6	**Knowledge & technology outputs**	**22.4**	**92**	
6.1	Knowledge creation	7.3	87	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.1	93	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.1	77	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	11.5	65	
6.1.5	Citable documents H index	111.0	66	
6.2	Knowledge impact	33.9	90	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.7	51	
6.2.2	New businesses/th pop. 15–64	1.2	61	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.0	116	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	26.0	80	
6.3.1	Royalty & license fees receipts, % total trade	0.2	34	●
6.3.2	High-tech exports less re-exports, % total trade	0.1	99	
6.3.3	Comm., computer & info. services exp., % total trade	1.7	50	
6.3.4	FDI net outflows, % GDP	0.3	77	
7	**Creative outputs**	**17.9**	**126**	
7.1	Intangible assets	33.6	120	
7.1.1	Domestic res trademark app./bn PPP$ GDP	10.0	95	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	50.2	92	
7.1.4	ICTs & organizational model creation†	46.3	96	
7.2	Creative goods & services	0.8	133	○
7.2.1	Cultural & creative services exports, % total trade	0.0	83	○
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.0	110	
7.3	Online creativity	3.5	98	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.3	121	
7.3.2	Country-code TLDs/th pop. 15–69	0.1	123	
7.3.3	Wikipedia edits/pop. 15–69	46.5	123	
7.3.4	Video uploads on YouTube/pop. 15–69	13.4	73	○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Ukraine

Key indicators

Population (millions)	44.9
GDP (US$ billions)	130.7
GDP per capita, PPP$	7,552.4
Income group	Lower-middle income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**36.5**	**64**	
Innovation Output Sub-Index		33.9	47	
Innovation Input Sub-Index		39.1	84	
Innovation Efficiency Ratio		0.9	15	●
Global Innovation Index 2014 (out of 143)		36.3	63	
1	**Institutions**	**52.2**	**98**	
1.1	Political environment	34.6	112	
1.1.1	Political stability*	45.4	110	
1.1.2	Government effectiveness*	23.8	109	
1.2	Regulatory environment	59.2	89	
1.2.1	Regulatory quality*	30.8	112	
1.2.2	Rule of law*	25.7	114	○
1.2.3	Cost of redundancy dismissal, salary weeks	13.0	53	
1.3	Business environment	63.0	92	
1.3.1	Ease of starting a business*	87.4	64	
1.3.2	Ease of resolving insolvency*	31.2	121	○
1.3.3	Ease of paying taxes*	70.3	85	
2	**Human capital & research**	**40.4**	**36**	
2.1	Education	55.8	25	●
2.1.1	Expenditure on education, % GDP	6.7	18	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	30.1	23	
2.1.3	School life expectancy, years	15.1	40	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	9.3	20	●
2.2	Tertiary education	45.0	31	
2.2.1	Tertiary enrolment, % gross	79.0	13	●
2.2.2	Graduates in science & engineering, %	25.6	20	
2.2.3	Tertiary inbound mobility, %	2.3	63	
2.3	Research & development (R&D)	20.4	45	
2.3.1	Researchers, FTE/mn pop.	1163.3	46	
2.3.2	Gross expenditure on R&D, % GDP	0.8	44	
2.3.3	QS university ranking, average score top 3*	29.4	46	
3	**Infrastructure**	**26.3**	**112**	
3.1	Information & communication technologies (ICTs)	38.2	89	
3.1.1	ICT access*	61.6	63	
3.1.2	ICT use*	21.1	89	
3.1.3	Government's online service*	26.8	112	○
3.1.4	E-participation*	43.1	76	
3.2	General infrastructure	16.0	127	○
3.2.1	Electricity output, kWh/cap	4351.0	48	
3.2.2	Logistics performance*	41.6	59	
3.2.3	Gross capital formation, % GDP	8.2	140	○
3.3	Ecological sustainability	24.8	121	○
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	2.8	116	○
3.3.2	Environmental performance*	49.0	85	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.5	82	
4	**Market sophistication**	**43.9**	**89**	
4.1	Credit	33.3	60	
4.1.1	Ease of getting credit*	75.0	16	●
4.1.2	Domestic credit to private sector, % GDP	74.0	42	
4.1.3	Microfinance gross loans, % GDP	0.1	64	
4.2	Investment	21.4	136	○
4.2.1	Ease of protecting investors*	48.3	96	
4.2.2	Market capitalization, % GDP	11.7	86	○
4.2.3	Total value of stocks traded, % GDP	0.7	75	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	51	
4.3	Trade & competition	77.1	66	
4.3.1	Applied tariff rate, weighted mean, %	2.1	46	
4.3.2	Intensity of local competition†	61.3	97	
5	**Business sophistication**	**32.4**	**78**	
5.1	Knowledge workers	42.4	52	
5.1.1	Knowledge-intensive employment, %	33.7	39	
5.1.2	Firms offering formal training, % firms	22.5	84	
5.1.3	GERD performed by business, % of GDP	0.4	36	
5.1.4	GERD financed by business, %	29.0	51	
5.1.5	Females employed w/advanced degrees, % total	28.1	4	●
5.2	Innovation linkages	24.1	105	
5.2.1	University/industry research collaboration†	41.7	72	
5.2.2	State of cluster development†	33.3	122	○
5.2.3	GERD financed by abroad, %	21.6	17	●
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	80	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	88	
5.3	Knowledge absorption	30.6	88	
5.3.1	Royalty & license fees payments, % total trade	1.2	22	●
5.3.2	High-tech imports less re-imports, % total trade	6.5	74	
5.3.3	Comm., computer & info. services imp., % total trade	0.8	68	
5.3.4	FDI net inflows, % GDP	2.1	78	
6	**Knowledge & technology outputs**	**36.4**	**34**	
6.1	Knowledge creation	49.2	14	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	7.3	12	●
6.1.2	PCT resident patent app./bn PPP$ GDP	0.4	44	
6.1.3	Domestic res utility model app./bn PPP$ GDP	25.4	1	●
6.1.4	Scientific & technical articles/bn PPP$ GDP	13.2	58	
6.1.5	Citable documents H index	159.0	43	
6.2	Knowledge impact	31.3	98	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.2	66	
6.2.2	New businesses/th pop. 15–64	0.9	70	
6.2.3	Computer software spending, % GDP	0.3	47	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	3.3	77	
6.2.5	High- & medium-high-tech manufactures, %	24.9	46	
6.3	Knowledge diffusion	28.6	65	
6.3.1	Royalty & license fees receipts, % total trade	0.2	40	
6.3.2	High-tech exports less re-exports, % total trade	2.4	47	
6.3.3	Comm., computer & info. services exp., % total trade	2.2	36	
6.3.4	FDI net outflows, % GDP	0.2	80	
7	**Creative outputs**	**31.3**	**75**	
7.1	Intangible assets	43.0	82	
7.1.1	Domestic res trademark app./bn PPP$ GDP	83.8	19	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.2	26	
7.1.3	ICTs & business model creation†	45.9	108	○
7.1.4	ICTs & organizational model creation†	44.4	98	
7.2	Creative goods & services	13.5	87	
7.2.1	Cultural & creative services exports, % total trade	0.0	65	
7.2.2	National feature films/mn pop. 15–69	0.4	99	○
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	1.5	48	
7.2.5	Creative goods exports, % total trade	0.6	55	
7.3	Online creativity	25.7	51	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	5.1	60	
7.3.2	Country-code TLDs/th pop. 15–69	8.1	46	
7.3.3	Wikipedia edits/pop. 15–69	1472.1	66	
7.3.4	Video uploads on YouTube/pop. 15–69	78.6	37	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

United Arab Emirates

Key indicators

Population (millions)	9.4
GDP (US$ billions)	401.6
GDP per capita, PPP$	30,984.6
Income group	High income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**40.1**	**47**	
Innovation Output Sub-Index		23.3	99	○
Innovation Input Sub-Index		56.9	25	
Innovation Efficiency Ratio		0.4	133	○
Global Innovation Index 2014 (out of 143)		43.2	36	
1	**Institutions**	**80.3**	**26**	
1.1	Political environment	79.9	23	
1.1.1	Political stability*	86.9	26	
1.1.2	Government effectiveness*	73.0	28	
1.2	Regulatory environment	83.3	24	
1.2.1	Regulatory quality*	68.5	37	
1.2.2	Rule of law*	64.7	38	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	77.6	33	
1.3.1	Ease of starting a business*	90.0	49	
1.3.2	Ease of resolving insolvency*	43.5	86	
1.3.3	Ease of paying taxes*	99.4	1	●
2	**Human capital & research**	**53.9**	**15**	
2.1	Education	70.6	3	
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	n/a	n/a	
2.1.4	PISA scales in reading, maths, & science	468.7	38	
2.1.5	Pupil-teacher ratio, secondary	11.5	39	
2.2	Tertiary education	68.3	2	●
2.2.1	Tertiary enrolment, % gross	n/a	n/a	
2.2.2	Graduates in science & engineering, %	26.0	19	
2.2.3	Tertiary inbound mobility, %	44.6	1	●
2.3	Research & development (R&D)	22.9	42	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP◴	0.5	63	
2.3.3	QS university ranking, average score top 3*	34.5	40	
3	**Infrastructure**	**56.7**	**19**	
3.1	Information & communication technologies (ICTs)	78.6	12	●
3.1.1	ICT access*	76.7	31	
3.1.2	ICT use*	65.1	21	
3.1.3	Government's online service*	88.2	12	●
3.1.4	E-participation*	84.3	13	●
3.2	General infrastructure	47.1	23	
3.2.1	Electricity output, kWh/cap	10958.4	10	●
3.2.2	Logistics performance*	70.3	26	
3.2.3	Gross capital formation, % GDP	22.3	63	
3.3	Ecological sustainability	44.5	48	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.9	68	
3.3.2	Environmental performance*	72.9	25	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.0	47	
4	**Market sophistication**	**48.1**	**65**	
4.1	Credit	31.7	65	
4.1.1	Ease of getting credit*	45.0	80	
4.1.2	Domestic credit to private sector, % GDP◴	59.1	56	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	27.9	105	○
4.2.1	Ease of protecting investors*	60.8	41	
4.2.2	Market capitalization, % GDP	18.3	73	○
4.2.3	Total value of stocks traded, % GDP	4.7	51	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	48	○
4.3	Trade & competition	84.8	29	
4.3.1	Applied tariff rate, weighted mean, %	3.8	62	
4.3.2	Intensity of local competition†	82.6	7	●
5	**Business sophistication**	**45.2**	**29**	
5.1	Knowledge workers	41.7	57	
5.1.1	Knowledge-intensive employment, %◴	36.1	31	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	0.1	54	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	62.6	2	●
5.2.1	University/industry research collaboration†	62.1	21	
5.2.2	State of cluster development†	74.8	3	●
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.1	1	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	93	○
5.3	Knowledge absorption	31.2	83	
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	5.5	91	○
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP◴	2.5	72	
6	**Knowledge & technology outputs**	**12.0**	**134**	○
6.1	Knowledge creation	3.8	114	○
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.0	109	○
6.1.2	PCT resident patent app./bn PPP$ GDP	0.2	54	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.7	119	○
6.1.5	Citable documents H index	100.0	71	
6.2	Knowledge impact	31.7	97	○
6.2.1	Growth rate of PPP$ GDP/worker, %	1.2	69	
6.2.2	New businesses/th pop. 15–64	1.4	57	
6.2.3	Computer software spending, % GDP	0.3	59	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	6.8	52	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	0.4	137	○
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.1	114	○
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**34.6**	**61**	
7.1	Intangible assets	52.6	37	
7.1.1	Domestic res trademark app./bn PPP$ GDP	9.3	96	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	79.1	2	●
7.1.4	ICTs & organizational model creation†	74.8	5	●
7.2	Creative goods & services	6.1	115	○
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	14.1	30	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade◴	0.1	97	○
7.3	Online creativity	27.1	48	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	12.6	40	
7.3.2	Country-code TLDs/th pop. 15–69	6.0	50	
7.3.3	Wikipedia edits/pop. 15–69	1889.2	55	
7.3.4	Video uploads on YouTube/pop. 15–69	75.9	44	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

United Kingdom

Key indicators

Population (millions)	63.5
GDP (US$ billions)	2,945.1
GDP per capita, PPP$	38,710.5
Income group	High income
Region	Europe

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**62.4**	**2**	●
Innovation Output Sub-Index		57.7	5	●
Innovation Input Sub-Index		67.1	6	●
Innovation Efficiency Ratio		0.9	18	
Global Innovation Index 2014 (out of 143)		62.4	2	
1	**Institutions**	**87.3**	**14**	
1.1	Political environment	78.6	24	
1.1.1	Political stability*	76.1	46	○
1.1.2	Government effectiveness*	81.2	19	
1.2	Regulatory environment	95.4	9	
1.2.1	Regulatory quality*	94.8	9	
1.2.2	Rule of law*	92.2	14	
1.2.3	Cost of redundancy dismissal, salary weeks	9.3	29	
1.3	Business environment	87.9	10	
1.3.1	Ease of starting a business*	91.2	39	
1.3.2	Ease of resolving insolvency*	82.0	12	
1.3.3	Ease of paying taxes*	90.5	15	
2	**Human capital & research**	**57.5**	**7**	
2.1	Education	56.2	23	
2.1.1	Expenditure on education, % GDP	6.0	30	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	31.5	19	
2.1.3	School life expectancy, years	16.2	22	
2.1.4	PISA scales in reading, maths, & science	502.5	17	
2.1.5	Pupil-teacher ratio, secondary◴	14.3	56	○
2.2	Tertiary education	53.0	12	
2.2.1	Tertiary enrolment, % gross	61.9	36	
2.2.2	Graduates in science & engineering, %	21.9	39	○
2.2.3	Tertiary inbound mobility, %	17.1	8	
2.3	Research & development (R&D)	63.2	11	
2.3.1	Researchers, FTE/mn pop.	4107.7	19	
2.3.2	Gross expenditure on R&D, % GDP	1.7	21	
2.3.3	QS university ranking, average score top 3*	99.3	1	●
3	**Infrastructure**	**63.0**	**6**	●
3.1	Information & communication technologies (ICTs)	89.1	3	●
3.1.1	ICT access*	91.8	6	
3.1.2	ICT use*	78.8	6	
3.1.3	Government's online service*	89.8	11	
3.1.4	E-participation*	96.1	4	●
3.2	General infrastructure	38.2	48	○
3.2.1	Electricity output, kWh/cap	5519.5	35	
3.2.2	Logistics performance*	94.5	4	●
3.2.3	Gross capital formation, % GDP	15.0	122	○
3.3	Ecological sustainability	61.8	7	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	11.1	19	
3.3.2	Environmental performance*	77.4	12	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	6.9	14	
4	**Market sophistication**	**74.3**	**3**	●
4.1	Credit	63.0	8	
4.1.1	Ease of getting credit*	75.0	16	
4.1.2	Domestic credit to private sector, % GDP	155.5	13	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	69.5	6	●
4.2.1	Ease of protecting investors*	78.3	4	●
4.2.2	Market capitalization, % GDP	115.5	9	
4.2.3	Total value of stocks traded, % GDP	95.2	5	
4.2.4	Venture capital deals/tr PPP$ GDP	0.3	12	
4.3	Trade & competition	90.4	5	●
4.3.1	Applied tariff rate, weighted mean, %	1.0	9	
4.3.2	Intensity of local competition†	84.2	4	●
5	**Business sophistication**	**53.6**	**13**	
5.1	Knowledge workers	63.8	13	
5.1.1	Knowledge-intensive employment, %	47.7	6	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP	1.1	20	
5.1.4	GERD financed by business, %	46.5	24	
5.1.5	Females employed w/advanced degrees, % total	21.7	17	
5.2	Innovation linkages	53.4	9	
5.2.1	University/industry research collaboration†	77.8	4	●
5.2.2	State of cluster development†	70.6	9	
5.2.3	GERD financed by abroad, %	20.6	20	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	18	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.9	17	
5.3	Knowledge absorption	43.6	30	
5.3.1	Royalty & license fees payments, % total trade	1.1	26	
5.3.2	High-tech imports less re-imports, % total trade	11.2	26	
5.3.3	Comm., computer & info. services imp., % total trade	1.7	30	
5.3.4	FDI net inflows, % GDP	1.9	89	○
6	**Knowledge & technology outputs**	**54.9**	**8**	
6.1	Knowledge creation	58.6	7	
6.1.1	Domestic resident patent app./bn PPP$ GDP	6.1	13	
6.1.2	PCT resident patent app./bn PPP$ GDP	2.1	22	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	41.5	14	
6.1.5	Citable documents H index	934.0	1	●
6.2	Knowledge impact	58.7	2	●
6.2.1	Growth rate of PPP$ GDP/worker, %	0.8	78	○
6.2.2	New businesses/th pop. 15–64	11.0	10	
6.2.3	Computer software spending, % GDP	0.7	5	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	18.2	21	
6.2.5	High- & medium-high-tech manufactures, %	42.9	17	
6.3	Knowledge diffusion	47.5	23	
6.3.1	Royalty & license fees receipts, % total trade	1.7	11	
6.3.2	High-tech exports less re-exports, % total trade	9.4	23	
6.3.3	Comm., computer & info. services exp., % total trade	3.5	14	
6.3.4	FDI net outflows, % GDP	0.3	78	○
7	**Creative outputs**	**60.5**	**5**	●
7.1	Intangible assets	54.5	31	
7.1.1	Domestic res trademark app./bn PPP$ GDP	50.2	50	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	1.2	27	○
7.1.3	ICTs & business model creation†	75.7	8	
7.1.4	ICTs & organizational model creation†	74.3	8	
7.2	Creative goods & services	48.1	4	●
7.2.1	Cultural & creative services exports, % total trade	1.6	3	●
7.2.2	National feature films/mn pop. 15–69	5.4	37	○
7.2.3	Global ent. & media output/th pop. 15–69	58.9	8	
7.2.4	Printing & publishing output manufactures, %	2.2	25	
7.2.5	Creative goods exports, % total trade	2.8	14	
7.3	Online creativity	84.7	3	●
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	72.9	12	
7.3.2	Country-code TLDs/th pop. 15–69	100.0	1	●
7.3.3	Wikipedia edits/pop. 15–69	9652.4	4	●
7.3.4	Video uploads on YouTube/pop. 15–69	94.7	4	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

United States of America

Key indicators

Population (millions)	322.6
GDP (US$ billions)	17,418.9
GDP per capita, PPP$	54,979.9
Income group	High income
Region	Northern America

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**60.1**	**5**	
Innovation Output Sub-Index		52.9	9	
Innovation Input Sub-Index		67.3	5	
Innovation Efficiency Ratio		0.8	33	
Global Innovation Index 2014 (out of 143)		60.1	6	
1	**Institutions**	**86.8**	**16**	
1.1	Political environment	80.6	22	
1.1.1	Political stability*	79.2	40	
1.1.2	Government effectiveness*	82.0	17	
1.2	Regulatory environment	92.4	14	
1.2.1	Regulatory quality*	81.3	21	
1.2.2	Rule of law*	88.5	18	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	87.4	11	
1.3.1	Ease of starting a business*	91.2	40	
1.3.2	Ease of resolving insolvency*	90.1	4	●
1.3.3	Ease of paying taxes*	80.8	42	
2	**Human capital & research**	**54.0**	**14**	
2.1	Education	52.1	42	
2.1.1	Expenditure on education, % GDP	5.2	47	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	23.9	44	
2.1.3	School life expectancy, years	16.4	16	
2.1.4	PISA scales in reading, maths, & science	492.1	25	
2.1.5	Pupil-teacher ratio, secondary	14.7	61	
2.2	Tertiary education	39.0	49	
2.2.1	Tertiary enrolment, % gross	94.3	3	●
2.2.2	Graduates in science & engineering, %	16.0	75	○
2.2.3	Tertiary inbound mobility, %	3.5	49	
2.3	Research & development (R&D)	71.1	8	
2.3.1	Researchers, FTE/mn pop.◴	3978.7	22	
2.3.2	Gross expenditure on R&D, % GDP◴	2.8	10	
2.3.3	QS university ranking, average score top 3*	99.2	2	●
3	**Infrastructure**	**58.8**	**14**	
3.1	Information & communication technologies (ICTs)	84.9	8	
3.1.1	ICT access*	77.8	28	
3.1.2	ICT use*	75.0	10	
3.1.3	Government's online service*	94.5	4	
3.1.4	E-participation*	92.2	9	
3.2	General infrastructure	52.4	15	
3.2.1	Electricity output, kWh/cap	13492.7	8	
3.2.2	Logistics performance*	89.6	9	
3.2.3	Gross capital formation, % GDP	19.8	89	○
3.3	Ecological sustainability	39.2	62	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.6	76	○
3.3.2	Environmental performance*	67.5	33	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	96	○
4	**Market sophistication**	**81.5**	**1**	●
4.1	Credit	79.2	1	●
4.1.1	Ease of getting credit*	95.0	2	●
4.1.2	Domestic credit to private sector, % GDP	192.3	4	●
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	76.7	2	●
4.2.1	Ease of protecting investors*	65.8	25	
4.2.2	Market capitalization, % GDP	115.5	8	
4.2.3	Total value of stocks traded, % GDP	132.2	1	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.7	6	
4.3	Trade & competition	88.5	11	
4.3.1	Applied tariff rate, weighted mean, %	1.5	41	
4.3.2	Intensity of local competition†	82.3	8	
5	**Business sophistication**	**55.4**	**9**	
5.1	Knowledge workers	65.5	11	
5.1.1	Knowledge-intensive employment, %	38.0	26	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % of GDP◴	1.9	11	
5.1.4	GERD financed by business, %◴	59.1	14	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	51.0	12	
5.2.1	University/industry research collaboration†	80.8	2	●
5.2.2	State of cluster development†	73.6	4	
5.2.3	GERD financed by abroad, %◴	3.8	72	○
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	16	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	1.5	11	
5.3	Knowledge absorption	49.6	15	
5.3.1	Royalty & license fees payments, % total trade	1.6	14	
5.3.2	High-tech imports less re-imports, % total trade	16.1	10	
5.3.3	Comm., computer & info. services imp., % total trade	1.4	41	
5.3.4	FDI net inflows, % GDP	1.4	101	○
6	**Knowledge & technology outputs**	**58.0**	**4**	●
6.1	Knowledge creation	68.5	4	●
6.1.1	Domestic resident patent app./bn PPP$ GDP	17.2	1	●
6.1.2	PCT resident patent app./bn PPP$ GDP	3.5	13	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	20.6	39	
6.1.5	Citable documents H index	1518.0	1	●
6.2	Knowledge impact	56.0	8	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.8	79	○
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	1.0	1	●
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	2.1	90	○
6.2.5	High- & medium-high-tech manufactures, %◴	43.3	14	
6.3	Knowledge diffusion	49.5	18	
6.3.1	Royalty & license fees receipts, % total trade	5.1	3	●
6.3.2	High-tech exports less re-exports, % total trade	6.8	26	
6.3.3	Comm., computer & info. services exp., % total trade	1.3	67	
6.3.4	FDI net outflows, % GDP	2.4	27	
7	**Creative outputs**	**47.8**	**23**	
7.1	Intangible assets	45.6	66	
7.1.1	Domestic res trademark app./bn PPP$ GDP	20.3	82	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.4	46	○
7.1.3	ICTs & business model creation†	71.1	18	
7.1.4	ICTs & organizational model creation†	74.0	9	
7.2	Creative goods & services	39.7	18	
7.2.1	Cultural & creative services exports, % total trade	1.2	10	
7.2.2	National feature films/mn pop. 15–69	3.2	48	
7.2.3	Global ent. & media output/th pop. 15–69	67.7	4	
7.2.4	Printing & publishing output manufactures, %◴	1.9	30	
7.2.5	Creative goods exports, % total trade	1.7	29	
7.3	Online creativity	60.3	17	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	100.0	1	●
7.3.2	Country-code TLDs/th pop. 15–69	3.3	63	
7.3.3	Wikipedia edits/pop. 15–69	5148.4	25	
7.3.4	Video uploads on YouTube/pop. 15–69	100.0	1	●

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Uruguay

Key indicators

Population (millions)	3.4
GDP (US$ billions)	55.1
GDP per capita, PPP$	17,390.7
Income group	High income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**35.8**	**68**	
Innovation Output Sub-Index		28.4	66	
Innovation Input Sub-Index		43.1	63	
Innovation Efficiency Ratio		0.7	91	
Global Innovation Index 2014 (out of 143)		34.8	72	
1	**Institutions**	**68.2**	**50**	
1.1	Political environment	68.3	43	
1.1.1	Political stability*	84.2	32	●
1.1.2	Government effectiveness*	52.3	49	
1.2	Regulatory environment	68.0	63	
1.2.1	Regulatory quality*	61.7	48	
1.2.2	Rule of law*	61.0	42	
1.2.3	Cost of redundancy dismissal, salary weeks	20.8	96	
1.3	Business environment	68.5	74	
1.3.1	Ease of starting a business*	89.7	51	
1.3.2	Ease of resolving insolvency*	53.5	55	
1.3.3	Ease of paying taxes*	62.3	107	
2	**Human capital & research**	**29.3**	**67**	
2.1	Education	42.1	80	
2.1.1	Expenditure on education, % GDP	4.4	74	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	10.7	96	○
2.1.3	School life expectancy, years◴	15.5	32	●
2.1.4	PISA scales in reading, maths, & science	412.2	52	○
2.1.5	Pupil-teacher ratio, secondary◴	11.3	35	
2.2	Tertiary education	37.3	53	
2.2.1	Tertiary enrolment, % gross◴	63.2	32	●
2.2.2	Graduates in science & engineering, %◴	15.6	81	○
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	8.6	73	
2.3.1	Researchers, FTE/mn pop.	529.2	59	
2.3.2	Gross expenditure on R&D, % GDP◴	0.2	82	
2.3.3	QS university ranking, average score top 3*	14.0	60	
3	**Infrastructure**	**49.1**	**38**	●
3.1	Information & communication technologies (ICTs)	74.8	20	●
3.1.1	ICT access*	70.5	43	
3.1.2	ICT use*	45.6	47	
3.1.3	Government's online service*	85.0	14	●
3.1.4	E-participation*	98.0	3	●
3.2	General infrastructure	26.8	89	
3.2.1	Electricity output, kWh/cap	3117.6	60	
3.2.2	Logistics performance*	26.4	86	
3.2.3	Gross capital formation, % GDP	23.1	56	
3.3	Ecological sustainability	45.8	42	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	11.8	17	●
3.3.2	Environmental performance*	53.6	63	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.0	46	
4	**Market sophistication**	**38.9**	**117**	○
4.1	Credit	22.6	103	
4.1.1	Ease of getting credit*	60.0	48	
4.1.2	Domestic credit to private sector, % GDP	26.8	104	
4.1.3	Microfinance gross loans, % GDP◴	0.0	78	○
4.2	Investment	20.7	137	○
4.2.1	Ease of protecting investors*	47.5	97	
4.2.2	Market capitalization, % GDP	0.4	108	○
4.2.3	Total value of stocks traded, % GDP	0.0	108	○
4.2.4	Venture capital deals/tr PPP$ GDP	0.1	32	
4.3	Trade & competition	73.3	85	
4.3.1	Applied tariff rate, weighted mean, %	4.1	69	
4.3.2	Intensity of local competition†	61.0	99	
5	**Business sophistication**	**29.7**	**96**	
5.1	Knowledge workers	36.7	75	
5.1.1	Knowledge-intensive employment, %◴	23.1	65	
5.1.2	Firms offering formal training, % firms◴	48.6	30	●
5.1.3	GERD performed by business, % of GDP◴	0.0	73	○
5.1.4	GERD financed by business, %◴	15.0	66	
5.1.5	Females employed w/advanced degrees, % total	13.6	46	
5.2	Innovation linkages	24.7	103	
5.2.1	University/industry research collaboration†	43.2	68	
5.2.2	State of cluster development†	41.1	90	
5.2.3	GERD financed by abroad, %◴	7.6	52	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	82	
5.3	Knowledge absorption	27.8	103	
5.3.1	Royalty & license fees payments, % total trade	0.2	81	
5.3.2	High-tech imports less re-imports, % total trade	8.9	50	
5.3.3	Comm., computer & info. services imp., % total trade	0.4	107	○
5.3.4	FDI net inflows, % GDP	5.1	33	●
6	**Knowledge & technology outputs**	**22.3**	**94**	
6.1	Knowledge creation	10.2	68	
6.1.1	Domestic resident patent app./bn PPP$ GDP◴	0.3	81	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP◴	0.6	36	
6.1.4	Scientific & technical articles/bn PPP$ GDP	12.6	61	
6.1.5	Citable documents H index	114.0	63	
6.2	Knowledge impact	36.3	77	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.8	34	
6.2.2	New businesses/th pop. 15–64	3.0	35	
6.2.3	Computer software spending, % GDP	0.3	61	○
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	12.5	32	●
6.2.5	High- & medium-high-tech manufactures, %◴	10.9	75	
6.3	Knowledge diffusion	20.3	110	
6.3.1	Royalty & license fees receipts, % total trade	0.0	100	○
6.3.2	High-tech exports less re-exports, % total trade	1.4	57	
6.3.3	Comm., computer & info. services exp., % total trade	1.5	59	
6.3.4	FDI net outflows, % GDP	0.0	97	
7	**Creative outputs**	**34.6**	**59**	
7.1	Intangible assets	52.4	38	
7.1.1	Domestic res trademark app./bn PPP$ GDP	66.7	29	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	60.8	46	
7.1.4	ICTs & organizational model creation†	59.7	43	
7.2	Creative goods & services	12.1	92	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	5.2	39	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	1.2	65	
7.2.5	Creative goods exports, % total trade	0.1	94	
7.3	Online creativity	21.6	63	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	7.5	51	
7.3.2	Country-code TLDs/th pop. 15–69	12.9	39	
7.3.3	Wikipedia edits/pop. 15–69	6005.2	18	●
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Uzbekistan

Key indicators

Population (millions)	29.3
GDP (US$ billions)	62.6
GDP per capita, PPP$	4,037.9
Income group	Lower-middle income
Region	Central and Southern Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**25.9**	**122**	
Innovation Output Sub-Index		17.9	127	
Innovation Input Sub-Index		33.9	112	
Innovation Efficiency Ratio		0.5	123	
Global Innovation Index 2014 (out of 143)		25.2	128	
1	**Institutions**	**49.0**	**106**	
1.1	Political environment	33.3	115	
1.1.1	Political stability*	50.6	100	
1.1.2	Government effectiveness*	16.1	126	
1.2	Regulatory environment	45.7	121	
1.2.1	Regulatory quality*	4.4	139	○
1.2.2	Rule of law*	15.6	133	○
1.2.3	Cost of redundancy dismissal, salary weeks	17.4	81	
1.3	Business environment	67.9	76	
1.3.1	Ease of starting a business*	89.0	55	●
1.3.2	Ease of resolving insolvency*	46.5	72	●
1.3.3	Ease of paying taxes*	68.3	92	
2	**Human capital & research**	**27.0**	**76**	
2.1	Education	55.2	29	
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years[4]	11.5	97	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary[4]	13.3	47	●
2.2	Tertiary education	22.6	95	
2.2.1	Tertiary enrolment, % gross[4]	8.9	117	
2.2.2	Graduates in science & engineering, %[4]	21.1	47	●
2.2.3	Tertiary inbound mobility, %[4]	0.1	107	○
2.3	Research & development (R&D)	3.2	92	
2.3.1	Researchers, FTE/mn pop.[4]	533.9	58	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**29.0**	**101**	
3.1	Information & communication technologies (ICTs)	35.6	93	
3.1.1	ICT access*	29.5	119	
3.1.2	ICT use*	20.9	90	
3.1.3	Government's online service*	44.9	72	
3.1.4	E-participation*	47.1	70	
3.2	General infrastructure	29.8	73	
3.2.1	Electricity output, kWh/cap	1762.9	79	
3.2.2	Logistics performance*	11.9	116	
3.2.3	Gross capital formation, % GDP	30.8	19	●
3.3	Ecological sustainability	21.5	132	○
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	2.6	117	○
3.3.2	Environmental performance*	43.2	101	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	129	○
4	**Market sophistication**	**44.4**	**85**	
4.1	Credit	25.2	87	
4.1.1	Ease of getting credit*	40.0	93	
4.1.2	Domestic credit to private sector, % GDP	n/a	n/a	
4.1.3	Microfinance gross loans, % GDP[4]	0.9	39	●
4.2	Investment	26.0	115	
4.2.1	Ease of protecting investors*	50.8	88	
4.2.2	Market capitalization, % GDP[4]	4.2	103	○
4.2.3	Total value of stocks traded, % GDP[4]	0.2	92	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	82.1	42	
4.3.1	Applied tariff rate, weighted mean, %	5.1	83	
4.3.2	Intensity of local competition†	n/a	n/a	
5	**Business sophistication**	**20.0**	**138**	○
5.1	Knowledge workers	9.9	135	○
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % firms	10.9	105	○
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	5.3	138	○
5.2.1	University/industry research collaboration†	n/a	n/a	
5.2.2	State of cluster development†	n/a	n/a	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	60	
5.2.5	Patent families 3+ offices/bn PPP$ GDP[4]	0.0	89	
5.3	Knowledge absorption	44.9	27	
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	1.9	90	
6	**Knowledge & technology outputs**	**27.2**	**61**	●
6.1	Knowledge creation	9.4	75	
6.1.1	Domestic resident patent app./bn PPP$ GDP	1.9	48	●
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	83	
6.1.3	Domestic res utility model app./bn PPP$ GDP	1.1	24	●
6.1.4	Scientific & technical articles/bn PPP$ GDP	1.9	129	
6.1.5	Citable documents H index	58.0	109	
6.2	Knowledge impact	45.0	38	●
6.2.1	Growth rate of PPP$ GDP/worker, %	5.3	6	●
6.2.2	New businesses/th pop. 15–64	0.6	83	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.4	130	○
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	n/a	n/a	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**8.5**	**138**	○
7.1	Intangible assets	11.0	136	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	31.1	69	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.0	67	○
7.1.3	ICTs & business model creation†	n/a	n/a	
7.1.4	ICTs & organizational model creation†	n/a	n/a	
7.2	Creative goods & services	12.0	93	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	3.1	49	●
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	0.2	126	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.0	141	○
7.3.2	Country-code TLDs/th pop. 15–69	0.4	105	
7.3.3	Wikipedia edits/pop. 15–69	50.0	120	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[4] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Venezuela, Bolivarian Republic of

Key indicators

Population (millions)	30.9
GDP (US$ billions)	205.8
GDP per capita, PPP$	13,530.5
Income group	Upper-middle income
Region	Latin America and the Caribbean

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**22.8**	**132**	
Innovation Output Sub-Index		18.4	121	
Innovation Input Sub-Index		27.1	133	
Innovation Efficiency Ratio		0.7	84	
Global Innovation Index 2014 (out of 143)		25.7	122	
1	**Institutions**	**17.0**	**141**	○
1.1	Political environment	24.1	131	
1.1.1	Political stability*	37.5	117	
1.1.2	Government effectiveness*	10.7	134	
1.2	Regulatory environment	1.0	141	○
1.2.1	Regulatory quality*	4.1	140	○
1.2.2	Rule of law*	0.0	141	○
1.2.3	Cost of redundancy dismissal, salary weeks◴	82.3	138	○
1.3	Business environment	25.9	141	○
1.3.1	Ease of starting a business*	45.2	139	○
1.3.2	Ease of resolving insolvency*	19.2	137	
1.3.3	Ease of paying taxes*	13.4	140	○
2	**Human capital & research**	**29.7**	**65**	
2.1	Education	40.5	84	
2.1.1	Expenditure on education, % GDP◴	6.9	13	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap◴	16.6	76	
2.1.3	School life expectancy, years◴	14.2	53	●
2.1.4	PISA scales in reading, maths, & science◴	413.4	50	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	33.4	64	
2.2.1	Tertiary enrolment, % gross◴	77.9	14	●
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %◴	0.1	113	
2.3	Research & development (R&D)	15.0	56	●
2.3.1	Researchers, FTE/mn pop.◴	290.0	66	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	26.6	48	●
3	**Infrastructure**	**30.7**	**97**	
3.1	Information & communication technologies (ICTs)	47.3	70	
3.1.1	ICT access*	53.6	75	
3.1.2	ICT use*	23.6	86	
3.1.3	Government's online service*	55.1	55	●
3.1.4	E-participation*	56.9	51	●
3.2	General infrastructure	26.4	93	
3.2.1	Electricity output, kWh/cap	4222.8	51	
3.2.2	Logistics performance*	33.0	73	
3.2.3	Gross capital formation, % GDP	19.9	87	
3.3	Ecological sustainability	18.4	137	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.2	88	
3.3.2	Environmental performance*	n/a	n/a	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	121	
4	**Market sophistication**	**27.3**	**141**	○
4.1	Credit	15.8	122	
4.1.1	Ease of getting credit*	40.0	93	
4.1.2	Domestic credit to private sector, % GDP	25.3	108	
4.1.3	Microfinance gross loans, % GDP◴	0.0	73	
4.2	Investment	15.6	140	○
4.2.1	Ease of protecting investors*	29.2	139	○
4.2.2	Market capitalization, % GDP	6.6	96	
4.2.3	Total value of stocks traded, % GDP	0.0	107	○
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	50.4	136	
4.3.1	Applied tariff rate, weighted mean, %	8.6	114	
4.3.2	Intensity of local competition†	31.2	132	○
5	**Business sophistication**	**31.1**	**88**	
5.1	Knowledge workers	50.2	35	●
5.1.1	Knowledge-intensive employment, %	19.2	75	
5.1.2	Firms offering formal training, % firms◴	56.0	16	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total◴	16.7	32	●
5.2	Innovation linkages	16.7	134	
5.2.1	University/industry research collaboration†	35.4	104	
5.2.2	State of cluster development†	23.3	132	○
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	88	○
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	100	
5.3	Knowledge absorption	26.2	109	
5.3.1	Royalty & license fees payments, % total trade◴	0.5	59	
5.3.2	High-tech imports less re-imports, % total trade	n/a	n/a	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.5	88	
5.3.4	FDI net inflows, % GDP	1.6	94	
6	**Knowledge & technology outputs**	**19.3**	**106**	
6.1	Knowledge creation	5.4	101	
6.1.1	Domestic resident patent app./bn PPP$ GDP◴	0.1	105	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	1.5	132	
6.1.5	Citable documents H index	141.0	53	●
6.2	Knowledge impact	26.7	115	
6.2.1	Growth rate of PPP$ GDP/worker, %	-0.9	109	
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.2	69	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.1	110	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	25.7	83	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	n/a	n/a	
6.3.3	Comm., computer & info. services exp., % total trade◴	0.2	113	
6.3.4	FDI net outflows, % GDP◴	0.4	71	
7	**Creative outputs**	**17.5**	**129**	
7.1	Intangible assets	30.1	128	
7.1.1	Domestic res trademark app./bn PPP$ GDP◴	22.1	78	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	38.2	126	
7.1.4	ICTs & organizational model creation†	40.9	114	
7.2	Creative goods & services	3.5	118	
7.2.1	Cultural & creative services exports, % total trade	0.0	79	
7.2.2	National feature films/mn pop. 15–69	1.0	73	
7.2.3	Global ent. & media output/th pop. 15–69	5.9	43	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade	n/a	n/a	
7.3	Online creativity	6.6	88	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.3	83	
7.3.2	Country-code TLDs/th pop. 15–69	5.5	51	●
7.3.3	Wikipedia edits/pop. 15–69	1623.9	61	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Viet Nam

Key indicators

Population (millions)	92.5
GDP (US$ billions)	186.0
GDP per capita, PPP$	4,256.3
Income group	Lower-middle income
Region	South East Asia and Oceania

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**38.3**	**52**	
Innovation Output Sub-Index		36.7	39	
Innovation Input Sub-Index		40.0	78	
Innovation Efficiency Ratio		0.9	9	●
Global Innovation Index 2014 (out of 143)		34.9	71	
1	**Institutions**	**51.8**	**101**	
1.1	Political environment	51.5	67	
1.1.1	Political stability*	69.7	53	
1.1.2	Government effectiveness*	33.3	86	
1.2	Regulatory environment	49.8	113	
1.2.1	Regulatory quality*	30.4	113	
1.2.2	Rule of law*	34.7	89	
1.2.3	Cost of redundancy dismissal, salary weeks	24.6	109	
1.3	Business environment	54.2	121	○
1.3.1	Ease of starting a business*	77.7	102	
1.3.2	Ease of resolving insolvency*	41.3	96	
1.3.3	Ease of paying taxes*	43.6	131	○
2	**Human capital & research**	**26.6**	**78**	
2.1	Education	48.3	56	
2.1.1	Expenditure on education, % GDP	6.3	24	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	n/a	n/a	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	29.3	75	
2.2.1	Tertiary enrolment, % gross	24.6	86	
2.2.2	Graduates in science & engineering, %	24.0	29	
2.2.3	Tertiary inbound mobility, %	0.2	105	○
2.3	Research & development (R&D)	2.1	100	
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP[4]	0.2	90	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**33.9**	**88**	
3.1	Information & communication technologies (ICTs)	40.1	84	
3.1.1	ICT access*	44.8	91	
3.1.2	ICT use*	25.0	83	
3.1.3	Government's online service*	41.7	79	
3.1.4	E-participation*	49.0	64	
3.2	General infrastructure	32.9	62	
3.2.1	Electricity output, kWh/cap	1383.9	89	
3.2.2	Logistics performance*	50.7	46	
3.2.3	Gross capital formation, % GDP	25.2	43	
3.3	Ecological sustainability	28.7	101	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	6.0	91	
3.3.2	Environmental performance*	38.2	113	○
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.9	48	
4	**Market sophistication**	**47.4**	**67**	
4.1	Credit	45.8	31	●
4.1.1	Ease of getting credit*	65.0	34	
4.1.2	Domestic credit to private sector, % GDP	96.8	32	●
4.1.3	Microfinance gross loans, % GDP	3.4	16	●
4.2	Investment	21.9	135	○
4.2.1	Ease of protecting investors*	46.7	102	
4.2.2	Market capitalization, % GDP	21.1	68	
4.2.3	Total value of stocks traded, % GDP	2.2	59	
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	60	○
4.3	Trade & competition	74.5	80	
4.3.1	Applied tariff rate, weighted mean, %[4]	5.7	88	
4.3.2	Intensity of local competition†	68.7	63	
5	**Business sophistication**	**40.5**	**40**	
5.1	Knowledge workers	27.8	98	
5.1.1	Knowledge-intensive employment, %	10.0	101	○
5.1.2	Firms offering formal training, % firms[4]	43.5	38	
5.1.3	GERD performed by business, % of GDP[4]	0.0	71	
5.1.4	GERD financed by business, %[4]	28.4	53	
5.1.5	Females employed w/advanced degrees, % total	6.2	73	○
5.2	Innovation linkages	21.0	120	○
5.2.1	University/industry research collaboration†	37.8	89	
5.2.2	State of cluster development†	46.0	72	
5.2.3	GERD financed by abroad, %[4]	4.0	71	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	67	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	96	○
5.3	Knowledge absorption	72.7	1	
5.3.1	Royalty & license fees payments, % total trade	n/a	n/a	
5.3.2	High-tech imports less re-imports, % total trade	22.0	4	●
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	5.2	32	●
6	**Knowledge & technology outputs**	**39.0**	**28**	●
6.1	Knowledge creation	6.7	89	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.9	65	
6.1.2	PCT resident patent app./bn PPP$ GDP	0.0	94	○
6.1.3	Domestic res utility model app./bn PPP$ GDP	0.5	37	
6.1.4	Scientific & technical articles/bn PPP$ GDP	4.7	99	
6.1.5	Citable documents H index	122.0	58	
6.2	Knowledge impact	48.3	25	●
6.2.1	Growth rate of PPP$ GDP/worker, %	3.8	17	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.3	31	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	12.0	33	●
6.2.5	High- & medium-high-tech manufactures, %[4]	26.2	44	
6.3	Knowledge diffusion	62.1	7	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	23.6	1	●
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	1.1	50	
7	**Creative outputs**	**34.3**	**62**	
7.1	Intangible assets	44.4	74	
7.1.1	Domestic res trademark app./bn PPP$ GDP	76.3	22	●
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	0.1	53	
7.1.3	ICTs & business model creation†	59.4	52	
7.1.4	ICTs & organizational model creation†	52.2	69	
7.2	Creative goods & services	29.1	40	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	1.3	68	
7.2.3	Global ent. & media output/th pop. 15–69	0.2	57	○
7.2.4	Printing & publishing output manufactures, %[4]	1.3	59	
7.2.5	Creative goods exports, % total trade	5.0	9	●
7.3	Online creativity	19.3	67	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.9	74	
7.3.2	Country-code TLDs/th pop. 15–69	3.5	61	
7.3.3	Wikipedia edits/pop. 15–69	267.7	101	
7.3.4	Video uploads on YouTube/pop. 15–69	68.9	57	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
[4] indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Yemen

Key indicators

Population (millions)	25.0
GDP (US$ billions)	43.2
GDP per capita, PPP$	2,399.1
Income group	Lower-middle income
Region	Northern Africa and Western Asia

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**20.8**	**137**	○
Innovation Output Sub-Index		16.4	131	
Innovation Input Sub-Index		25.2	138	○
Innovation Efficiency Ratio		0.7	97	●
Global Innovation Index 2014 (out of 143)		19.5	141	
1	**Institutions**	**34.9**	**136**	○
1.1	Political environment	7.5	140	○
1.1.1	Political stability*	6.1	140	○
1.1.2	Government effectiveness*	8.9	136	○
1.2	Regulatory environment	42.0	127	
1.2.1	Regulatory quality*	28.2	120	
1.2.2	Rule of law*	16.8	132	
1.2.3	Cost of redundancy dismissal, salary weeks	27.4	118	
1.3	Business environment	55.2	115	
1.3.1	Ease of starting a business*	74.4	113	
1.3.2	Ease of resolving insolvency*	27.5	129	
1.3.3	Ease of paying taxes*	63.6	103	●
2	**Human capital & research**	**14.5**	**127**	
2.1	Education	30.4	119	
2.1.1	Expenditure on education, % GDP◴	4.6	70	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	12.1	92	
2.1.3	School life expectancy, years◴	9.2	120	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary◴	16.1	70	●
2.2	Tertiary education	13.1	117	
2.2.1	Tertiary enrolment, % gross◴	10.3	110	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %◴	4.3	41	●
2.3	Research & development (R&D)	0.0	128	○
2.3.1	Researchers, FTE/mn pop.	n/a	n/a	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**19.4**	**134**	
3.1	Information & communication technologies (ICTs)	23.0	117	
3.1.1	ICT access*	26.6	123	
3.1.2	ICT use*	7.3	115	
3.1.3	Government's online service*	30.7	101	
3.1.4	E-participation*	27.5	108	
3.2	General infrastructure	0.8	141	○
3.2.1	Electricity output, kWh/cap	275.8	111	
3.2.2	Logistics performance*	1.2	130	○
3.2.3	Gross capital formation, % GDP	8.4	139	○
3.3	Ecological sustainability	34.5	84	●
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	12.3	10	●
3.3.2	Environmental performance*	30.2	127	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.0	137	○
4	**Market sophistication**	**35.3**	**133**	
4.1	Credit	0.3	141	○
4.1.1	Ease of getting credit*	0.0	140	○
4.1.2	Domestic credit to private sector, % GDP	6.3	138	○
4.1.3	Microfinance gross loans, % GDP	0.0	77	
4.2	Investment	39.2	52	
4.2.1	Ease of protecting investors*	39.2	129	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Total value of stocks traded, % GDP	n/a	n/a	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	66.3	109	
4.3.1	Applied tariff rate, weighted mean, %	6.2	92	●
4.3.2	Intensity of local competition†	54.5	119	
5	**Business sophistication**	**21.9**	**133**	
5.1	Knowledge workers	20.2	123	
5.1.1	Knowledge-intensive employment, %◴	17.0	85	●
5.1.2	Firms offering formal training, % firms◴	12.9	102	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	30.1	80	
5.2.1	University/industry research collaboration†	15.9	133	○
5.2.2	State of cluster development†	37.1	108	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	n/a	n/a	
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	15.5	140	○
5.3.1	Royalty & license fees payments, % total trade◴	0.0	112	
5.3.2	High-tech imports less re-imports, % total trade	3.2	120	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.3	113	
5.3.4	FDI net inflows, % GDP	-0.4	129	
6	**Knowledge & technology outputs**	**18.3**	**112**	
6.1	Knowledge creation	2.9	125	
6.1.1	Domestic resident patent app./bn PPP$ GDP	0.4	77	●
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	2.0	128	
6.1.5	Citable documents H index	42.0	125	
6.2	Knowledge impact	33.3	93	●
6.2.1	Growth rate of PPP$ GDP/worker, %	2.0	45	●
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.4	129	
6.2.5	High- & medium-high-tech manufactures, %◴	1.9	96	
6.3	Knowledge diffusion	18.7	115	
6.3.1	Royalty & license fees receipts, % total trade◴	0.4	25	●
6.3.2	High-tech exports less re-exports, % total trade	0.0	121	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**14.5**	**134**	
7.1	Intangible assets	23.2	134	○
7.1.1	Domestic res trademark app./bn PPP$ GDP	18.3	86	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	28.5	133	○
7.1.4	ICTs & organizational model creation†	32.1	128	
7.2	Creative goods & services	2.1	125	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %◴	0.4	94	
7.2.5	Creative goods exports, % total trade	0.0	122	
7.3	Online creativity	9.5	80	●
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.5	118	
7.3.2	Country-code TLDs/th pop. 15–69	0.0	131	
7.3.3	Wikipedia edits/pop. 15–69	117.5	112	
7.3.4	Video uploads on YouTube/pop. 15–69	36.5	70	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Zambia

Key indicators

Population (millions)	15.0
GDP (US$ billions)	26.8
GDP per capita, PPP$	1,849.7
Income group	Lower-middle income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**24.6**	**124**	
Innovation Output Sub-Index		20.0	115	
Innovation Input Sub-Index		29.3	130	
Innovation Efficiency Ratio		0.7	81	
Global Innovation Index 2014 (out of 143)		25.8	121	
1	**Institutions**	**48.8**	**107**	
1.1	Political environment	51.2	68	
1.1.1	Political stability*	73.8	49	●
1.1.2	Government effectiveness*	28.5	96	
1.2	Regulatory environment	26.6	136	○
1.2.1	Regulatory quality*	35.4	106	
1.2.2	Rule of law*	39.5	78	
1.2.3	Cost of redundancy dismissal, salary weeks	50.5	136	○
1.3	Business environment	68.7	72	
1.3.1	Ease of starting a business*	88.6	58	●
1.3.2	Ease of resolving insolvency*	43.0	89	
1.3.3	Ease of paying taxes*	74.5	61	●
2	**Human capital & research**	**6.3**	**141**	○
2.1	Education	9.9	141	○
2.1.1	Expenditure on education, % GDP◴	1.3	128	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	n/a	n/a	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	n/a	n/a	
2.2.1	Tertiary enrolment, % gross	n/a	n/a	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	2.8	97	
2.3.1	Researchers, FTE/mn pop.◴	43.0	93	
2.3.2	Gross expenditure on R&D, % GDP◴	0.3	75	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**23.6**	**121**	
3.1	Information & communication technologies (ICTs)	16.0	133	○
3.1.1	ICT access*	26.8	122	
3.1.2	ICT use*	5.4	121	
3.1.3	Government's online service*	14.2	130	○
3.1.4	E-participation*	17.6	124	
3.2	General infrastructure	30.6	69	
3.2.1	Electricity output, kWh/cap	841.6	95	
3.2.2	Logistics performance*	15.4	113	
3.2.3	Gross capital formation, % GDP	31.9	17	●
3.3	Ecological sustainability	24.2	122	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	4.1	107	
3.3.2	Environmental performance*	41.7	103	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	94	
4	**Market sophistication**	**45.0**	**83**	
4.1	Credit	24.7	89	
4.1.1	Ease of getting credit*	70.0	22	●
4.1.2	Domestic credit to private sector, % GDP	16.5	124	
4.1.3	Microfinance gross loans, % GDP	0.0	84	○
4.2	Investment	29.1	102	
4.2.1	Ease of protecting investors*	54.2	75	
4.2.2	Market capitalization, % GDP	12.0	84	
4.2.3	Total value of stocks traded, % GDP	0.8	71	
4.2.4	Venture capital deals/tr PPP$ GDP	n/a	n/a	
4.3	Trade & competition	81.1	47	●
4.3.1	Applied tariff rate, weighted mean, %	4.1	67	
4.3.2	Intensity of local competition†	76.6	23	●
5	**Business sophistication**	**22.6**	**129**	
5.1	Knowledge workers	15.4	130	○
5.1.1	Knowledge-intensive employment, %◴	7.3	105	
5.1.2	Firms offering formal training, % firms	28.2	69	
5.1.3	GERD performed by business, % of GDP◴	0.0	83	○
5.1.4	GERD financed by business, %◴	3.2	80	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	31.0	72	
5.2.1	University/industry research collaboration†	41.4	73	
5.2.2	State of cluster development†	51.9	43	●
5.2.3	GERD financed by abroad, %◴	1.6	83	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	22	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	n/a	n/a	
5.3	Knowledge absorption	21.3	133	○
5.3.1	Royalty & license fees payments, % total trade◴	0.0	121	○
5.3.2	High-tech imports less re-imports, % total trade	4.5	106	
5.3.3	Comm., computer & info. services imp., % total trade◴	0.2	117	○
5.3.4	FDI net inflows, % GDP	8.1	15	●
6	**Knowledge & technology outputs**	**21.6**	**98**	
6.1	Knowledge creation	4.7	107	
6.1.1	Domestic resident patent app./bn PPP$ GDP◴	0.1	94	
6.1.2	PCT resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	4.6	102	
6.1.5	Citable documents H index	75.0	92	
6.2	Knowledge impact	38.0	65	
6.2.1	Growth rate of PPP$ GDP/worker, %	2.9	32	●
6.2.2	New businesses/th pop. 15–64	1.4	58	
6.2.3	Computer software spending, % GDP	n/a	n/a	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.8	117	
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	22.1	104	
6.3.1	Royalty & license fees receipts, % total trade	n/a	n/a	
6.3.2	High-tech exports less re-exports, % total trade	0.6	73	
6.3.3	Comm., computer & info. services exp., % total trade◴	0.4	94	
6.3.4	FDI net outflows, % GDP	0.7	60	
7	**Creative outputs**	**18.4**	**123**	
7.1	Intangible assets	35.9	111	
7.1.1	Domestic res trademark app./bn PPP$ GDP	7.3	98	○
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	55.7	70	
7.1.4	ICTs & organizational model creation†	49.2	78	
7.2	Creative goods & services	1.9	126	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade◴	0.1	101	
7.3	Online creativity	0.1	130	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.1	130	
7.3.2	Country-code TLDs/th pop. 15–69	0.0	138	○
7.3.3	Wikipedia edits/pop. 15–69	44.3	124	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Zimbabwe

Key indicators

Population (millions)	14.6
GDP (US$ billions)	13.7
GDP per capita, PPP$	824.6
Income group	Low income
Region	Sub-Saharan Africa

		Score 0–100 or value (hard data)	Rank	
Global Innovation Index (out of 141)		**22.5**	**133**	
Innovation Output Sub-Index		18.4	120	
Innovation Input Sub-Index		26.6	134	
Innovation Efficiency Ratio		0.7	77	
Global Innovation Index 2014 (out of 143)		24.3	130	
1	**Institutions**	**25.9**	**140**	○
1.1	Political environment	28.9	122	
1.1.1	Political stability*	47.1	104	
1.1.2	Government effectiveness*	10.6	135	○
1.2	Regulatory environment	1.5	140	○
1.2.1	Regulatory quality*	0.0	141	○
1.2.2	Rule of law*	5.9	140	○
1.2.3	Cost of redundancy dismissal, salary weeks	82.3	138	○
1.3	Business environment	47.4	136	○
1.3.1	Ease of starting a business*	51.4	138	○
1.3.2	Ease of resolving insolvency*	29.3	125	
1.3.3	Ease of paying taxes*	61.4	109	
2	**Human capital & research**	**19.0**	**104**	
2.1	Education	31.9	110	
2.1.1	Expenditure on education, % GDP◴	2.0	126	○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	10.9	108	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	22.4	90	
2.2	Tertiary education	24.6	87	
2.2.1	Tertiary enrolment, % gross	5.8	122	
2.2.2	Graduates in science & engineering, %	23.3	33	●
2.2.3	Tertiary inbound mobility, %	0.4	99	
2.3	Research & development (R&D)	0.5	118	
2.3.1	Researchers, FTE/mn pop.◴	95.1	83	
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3	QS university ranking, average score top 3*	0.0	73	○
3	**Infrastructure**	**20.8**	**129**	
3.1	Information & communication technologies (ICTs)	31.6	101	
3.1.1	ICT access*	31.2	114	
3.1.2	ICT use*	19.2	91	
3.1.3	Government's online service*	30.7	101	
3.1.4	E-participation*	45.1	74	
3.2	General infrastructure	9.1	139	○
3.2.1	Electricity output, kWh/cap	662.4	102	
3.2.2	Logistics performance*	9.1	121	
3.2.3	Gross capital formation, % GDP	13.7	134	
3.3	Ecological sustainability	21.7	131	
3.3.1	GDP/unit of energy use, 2005 PPP$/kg oil eq	0.4	123	○
3.3.2	Environmental performance*	49.5	84	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.2	56	●
4	**Market sophistication**	**40.7**	**109**	
4.1	Credit	20.5	114	
4.1.1	Ease of getting credit*	40.0	93	
4.1.2	Domestic credit to private sector, % GDP	n/a	n/a	
4.1.3	Microfinance gross loans, % GDP	0.1	68	
4.2	Investment	36.0	64	●
4.2.1	Ease of protecting investors*	53.3	79	
4.2.2	Market capitalization, % GDP	94.7	16	●
4.2.3	Total value of stocks traded, % GDP	12.9	35	●
4.2.4	Venture capital deals/tr PPP$ GDP	0.0	41	
4.3	Trade & competition	65.6	114	
4.3.1	Applied tariff rate, weighted mean, %	n/a	n/a	
4.3.2	Intensity of local competition†	65.6	74	
5	**Business sophistication**	**26.7**	**115**	
5.1	Knowledge workers	23.4	112	
5.1.1	Knowledge-intensive employment, %◴	6.6	108	
5.1.2	Firms offering formal training, % firms◴	31.2	61	
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	
5.2	Innovation linkages	24.6	104	
5.2.1	University/industry research collaboration†	30.4	117	
5.2.2	State of cluster development†	32.4	125	
5.2.3	GERD financed by abroad, %	n/a	n/a	
5.2.4	JV–strategic alliance deals/tr PPP$ GDP	0.0	32	●
5.2.5	Patent families 3+ offices/bn PPP$ GDP	0.0	108	○
5.3	Knowledge absorption	32.0	76	
5.3.1	Royalty & license fees payments, % total trade◴	0.3	69	
5.3.2	High-tech imports less re-imports, % total trade	7.9	56	●
5.3.3	Comm., computer & info. services imp., % total trade	n/a	n/a	
5.3.4	FDI net inflows, % GDP	3.1	62	●
6	**Knowledge & technology outputs**	**12.3**	**130**	
6.1	Knowledge creation	9.5	74	
6.1.1	Domestic resident patent app./bn PPP$ GDP	n/a	n/a	
6.1.2	PCT resident patent app./bn PPP$ GDP◴	0.1	62	
6.1.3	Domestic res utility model app./bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	13.3	57	●
6.1.5	Citable documents H index	81.0	88	
6.2	Knowledge impact	23.9	121	
6.2.1	Growth rate of PPP$ GDP/worker, %	-3.4	115	○
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Computer software spending, % GDP	0.4	22	●
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	4.4	68	●
6.2.5	High- & medium-high-tech manufactures, %	n/a	n/a	
6.3	Knowledge diffusion	3.6	133	
6.3.1	Royalty & license fees receipts, % total trade◴	0.0	79	
6.3.2	High-tech exports less re-exports, % total trade	0.4	80	
6.3.3	Comm., computer & info. services exp., % total trade	n/a	n/a	
6.3.4	FDI net outflows, % GDP	n/a	n/a	
7	**Creative outputs**	**24.5**	**103**	
7.1	Intangible assets	44.0	76	
7.1.1	Domestic res trademark app./bn PPP$ GDP	n/a	n/a	
7.1.2	Madrid trademark app. holders/bn PPP$ GDP	n/a	n/a	
7.1.3	ICTs & business model creation†	47.1	102	
7.1.4	ICTs & organizational model creation†	40.9	113	
7.2	Creative goods & services	9.6	97	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	n/a	n/a	
7.2.3	Global ent. & media output/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing output manufactures, %	n/a	n/a	
7.2.5	Creative goods exports, % total trade◴	0.3	68	
7.3	Online creativity	0.4	120	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.5	117	
7.3.2	Country-code TLDs/th pop. 15–69	0.1	125	
7.3.3	Wikipedia edits/pop. 15–69	86.2	116	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.
◴ indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data.

Appendix II

Data Tables

Data Tables

This appendix provides tables for each of the 79 indicators that make up the Global Innovation Index 2015.

Structure

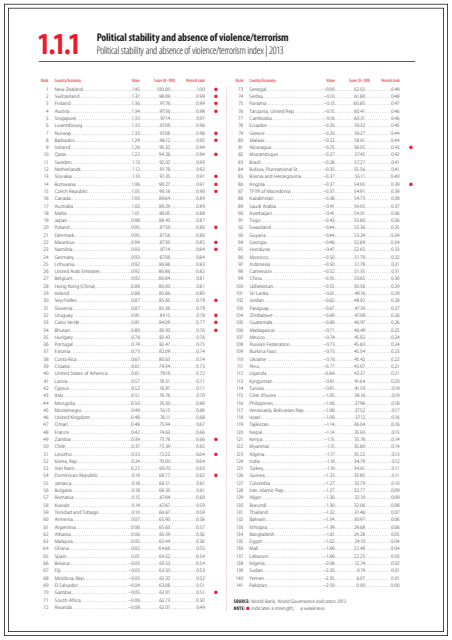
Each table is identified by indicator number, with the first digit representing the pillar, the second representing the sub-pillar, and the final digit representing the indicator within that particular sub-pillar. For example, Table 5.1.4 shows results for *indicator 5.1.4, GERD financed by business enterprise,* which is the fourth indicator of *sub-pillar 5.1, Knowledge workers,* within *pillar 5, Business sophistication*.

The sub-heading text provides a detailed description of each indicator and includes information on the units of each variable, the scaling factor (if any), the question asked (for survey questions), and the most frequent year for which data were available.

For each indicator for each economy, the most recent value within the period 2004–14 was used. In instances where this base year does not correspond to the most frequent year reported in the sub-heading, the year of the value appears in parentheses after the economy name. These instances are noted in the Country/Economy Profiles after the indicator name with a clock symbol.

A total of 55 variables are hard data. A total of 19 variables are composite indicators and 5 are survey questions from the World Economic Forum's Executive Opinion Survey.

The source of each indicator is indicated at the bottom of the page; details for each can be found in Appendix III, Sources and Definitions.



1.1.1 Political stability and absence of violence/terrorism

Political stability and absence of violence/terrorism index | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	New Zealand	1.45	100.00	1.00	●
2	Switzerland	1.37	98.09	0.99	●
3	Finland	1.36	97.76	0.98	●
4	Austria	1.34	97.26	0.98	●
5	Singapore	1.33	97.14	0.97	
6	Luxembourg	1.33	97.09	0.96	
7	Norway	1.33	97.08	0.96	●
8	Barbados	1.29	96.12	0.95	●
9	Iceland	1.26	95.32	0.94	
10	Qatar	1.22	94.26	0.94	●
11	Sweden	1.13	92.02	0.93	
12	Netherlands	1.12	91.78	0.92	
13	Slovakia	1.10	91.35	0.91	●
14	Botswana	1.06	90.27	0.91	●
15	Czech Republic	1.05	90.18	0.90	●
16	Canada	1.03	89.64	0.89	
17	Australia	1.02	89.29	0.89	
18	Malta	1.01	89.05	0.88	
19	Japan	0.98	88.43	0.87	
20	Poland	0.95	87.59	0.86	●
21	Denmark	0.95	87.56	0.86	
22	Mauritius	0.94	87.35	0.85	●
23	Namibia	0.93	87.14	0.84	●
24	Germany	0.93	87.08	0.84	
25	Lithuania	0.92	86.96	0.83	
26	United Arab Emirates	0.92	86.86	0.82	
27	Belgium	0.92	86.84	0.81	
28	Hong Kong (China)	0.88	86.00	0.81	
29	Ireland	0.88	85.86	0.80	
30	Seychelles	0.87	85.65	0.79	●
31	Slovenia	0.87	85.56	0.79	
32	Uruguay	0.81	84.15	0.78	●
33	Cabo Verde	0.81	84.09	0.77	●
34	Bhutan	0.80	83.93	0.76	●
35	Hungary	0.78	83.40	0.76	
36	Portugal	0.74	82.47	0.75	
37	Estonia	0.73	82.09	0.74	
38	Costa Rica	0.67	80.63	0.74	
39	Croatia	0.61	79.34	0.73	
40	United States of America	0.61	79.19	0.72	
41	Latvia	0.57	78.31	0.71	
42	Cyprus	0.52	76.97	0.71	
43	Italy	0.51	76.76	0.70	
44	Mongolia	0.50	76.50	0.69	
45	Montenegro	0.49	76.15	0.69	
46	United Kingdom	0.48	76.11	0.68	
47	Oman	0.48	75.94	0.67	
48	France	0.42	74.62	0.66	
49	Zambia	0.39	73.78	0.66	●
50	Chile	0.37	73.39	0.65	
51	Lesotho	0.33	72.22	0.64	●
52	Korea, Rep.	0.24	70.00	0.64	
53	Viet Nam	0.22	69.70	0.63	
54	Dominican Republic	0.19	68.77	0.62	●
55	Jamaica	0.18	68.51	0.61	
56	Bulgaria	0.18	68.50	0.61	
57	Romania	0.15	67.94	0.60	
58	Kuwait	0.14	67.67	0.59	
59	Trinidad and Tobago	0.10	66.67	0.59	
60	Armenia	0.07	65.90	0.58	
61	Argentina	0.06	65.63	0.57	
62	Albania	0.06	65.59	0.56	
63	Malaysia	0.05	65.44	0.56	
64	Ghana	0.02	64.66	0.55	
65	Spain	0.01	64.52	0.54	
66	Belarus	−0.03	63.33	0.54	
67	Fiji	−0.03	63.30	0.53	
68	Moldova, Rep.	−0.03	63.32	0.52	
69	El Salvador	−0.04	63.08	0.51	
70	Gambia	−0.05	63.05	0.51	●
71	South Africa	−0.06	62.73	0.50	
72	Rwanda	−0.08	62.07	0.49	
73	Senegal	−0.09	62.02	0.48	
74	Serbia	−0.10	61.80	0.48	
75	Panama	−0.13	60.85	0.47	
76	Tanzania, United Rep.	−0.15	60.41	0.46	
77	Cambodia	−0.16	60.31	0.46	
78	Ecuador	−0.20	59.52	0.45	
79	Greece	−0.20	59.27	0.44	
80	Malawi	−0.22	58.81	0.43	
81	Nicaragua	−0.25	58.05	0.43	●
82	Mozambique	−0.27	57.45	0.42	
83	Brazil	−0.28	57.27	0.41	
84	Bolivia, Plurinational St.	−0.35	55.56	0.41	
85	Bosnia and Herzegovina	−0.37	55.11	0.40	
86	Angola	−0.37	54.95	0.39	●
87	TFYR of Macedonia	−0.37	54.91	0.39	
88	Kazakhstan	−0.38	54.73	0.38	
89	Saudi Arabia	−0.41	54.05	0.37	
90	Azerbaijan	−0.41	54.00	0.36	
91	Togo	−0.43	53.60	0.36	
92	Swaziland	−0.44	53.36	0.35	
93	Guyana	−0.44	53.24	0.34	
94	Georgia	−0.46	52.69	0.34	
95	Honduras	−0.47	52.63	0.33	
96	Morocco	−0.50	51.79	0.32	
97	Indonesia	−0.50	51.78	0.31	
98	Cameroon	−0.52	51.35	0.31	
99	China	−0.55	50.65	0.30	
100	Uzbekistan	−0.55	50.58	0.29	
101	Sri Lanka	−0.60	49.36	0.29	
102	Jordan	−0.62	48.92	0.28	
103	Paraguay	−0.67	47.59	0.27	
104	Zimbabwe	−0.69	47.09	0.26	
105	Guatemala	−0.69	46.97	0.26	
106	Madagascar	−0.71	46.49	0.25	
107	Mexico	−0.74	45.92	0.24	
108	Russian Federation	−0.75	45.60	0.24	
109	Burkina Faso	−0.75	45.54	0.23	
110	Ukraine	−0.76	45.42	0.22	
111	Peru	−0.77	45.07	0.21	
112	Uganda	−0.84	43.37	0.21	
113	Kyrgyzstan	−0.91	41.64	0.20	
114	Tunisia	−0.91	41.59	0.19	
115	Côte d'Ivoire	−1.05	38.56	0.19	
116	Philippines	−1.06	37.96	0.18	
117	Venezuela, Bolivarian Rep.	−1.08	37.52	0.17	
118	Israel	−1.09	37.12	0.16	
119	Tajikistan	−1.14	36.04	0.16	
120	Nepal	−1.14	35.93	0.15	
121	Kenya	−1.15	35.76	0.14	
122	Myanmar	−1.15	35.60	0.14	
123	Algeria	−1.17	35.22	0.13	
124	India	−1.19	34.79	0.12	
125	Turkey	−1.19	34.61	0.11	
126	Guinea	−1.23	33.85	0.11	
127	Colombia	−1.27	32.79	0.10	
128	Iran, Islamic Rep.	−1.27	32.77	0.09	
129	Niger	−1.30	32.10	0.09	
130	Burundi	−1.30	32.06	0.08	
131	Thailand	−1.32	31.46	0.07	
132	Bahrain	−1.34	30.97	0.06	
133	Ethiopia	−1.39	29.68	0.06	
134	Bangladesh	−1.41	29.28	0.05	
135	Egypt	−1.62	24.10	0.04	
136	Mali	−1.66	22.48	0.04	
137	Lebanon	−1.69	22.25	0.03	
138	Nigeria	−2.08	12.74	0.02	
139	Sudan	−2.20	9.74	0.01	
140	Yemen	−2.35	6.01	0.01	
141	Pakistan	−2.59	0.00	0.00	

SOURCE: World Bank, World Governance Indicators 2013

NOTE: ● indicates a strength; ○ a weakness

Explanation of scores

The tables list the economies by their rank order, with the best performers at the top. After the rank comes the country/economy name, the original value of the specific indicator for that country (in the units specified in the sub-heading), the normalized score in the 0–100 range, and the percentage of economies with scores that fall below the normalized score (i.e., percent ranks). To the far right of each column, a solid circle indicates that an indicator is a strength for the country/economy in question, and a hollow circle indicates that it is a weakness (refer to Appendix I, Country/Economy Profiles, for details).

- Strengths (●) are all ranks of 1, as well as all scores with percent ranks greater than the 10th highest percent rank among the 79 indicators in a specific economy.
- Weaknesses (○) are all scores with percent ranks lower than the 10th smallest percent rank among the 79 indicators in a specific economy.

For three hard data series (7.3.1, 7.3.2, and 7.3.4), the raw data were provided under the condition that only the normalized scores be published and therefore the original value equals the normalized score. For indicators 1.3.1, 1.3.2, 1.3.3, 2.3.3, 3.3.2, 4.1.1, and 4.2.1, the range for both measures is the same—(0–100)—and therefore both measures are also identical.

Details on the computation methodology can be found in Appendix IV, Technical Notes.

Index of Data Tables

5 Business sophistication

5.1 Knowledge workers

5.2 Innovation linkages

5.3 Knowledge absorption

6 Knowledge & technology outputs

6.1 Knowledge creation

6.2 Knowledge impact

6.3 Knowledge diffusion

7 Creative outputs

7.1 Intangible assets

7.2 Creative goods & services

7.3 Online creativity

1.1.1 Political stability and absence of violence/terrorism

Political stability and absence of violence/terrorism index | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	New Zealand	1.45	100.00	1.00	●
2	Switzerland	1.37	98.09	0.99	●
3	Finland	1.36	97.76	0.99	●
4	Austria	1.34	97.36	0.98	●
5	Singapore	1.33	97.14	0.97	
6	Luxembourg	1.33	97.09	0.96	
7	Norway	1.33	97.08	0.96	●
8	Barbados	1.29	96.12	0.95	●
9	Iceland	1.26	95.32	0.94	
10	Qatar	1.22	94.26	0.94	●
11	Sweden	1.13	92.02	0.93	
12	Netherlands	1.12	91.78	0.92	
13	Slovakia	1.10	91.35	0.91	●
14	Botswana	1.06	90.27	0.91	●
15	Czech Republic	1.05	90.18	0.90	●
16	Canada	1.03	89.64	0.89	
17	Australia	1.02	89.29	0.89	
18	Malta	1.01	89.05	0.88	
19	Japan	0.98	88.43	0.87	
20	Poland	0.95	87.59	0.86	●
21	Denmark	0.95	87.56	0.86	
22	Mauritius	0.94	87.30	0.85	●
23	Namibia	0.93	87.14	0.84	●
24	Germany	0.93	87.08	0.84	
25	Lithuania	0.92	86.96	0.83	
26	United Arab Emirates	0.92	86.86	0.82	
27	Belgium	0.92	86.84	0.81	
28	Hong Kong (China)	0.88	86.00	0.81	
29	Ireland	0.88	85.86	0.80	
30	Seychelles	0.87	85.65	0.79	●
31	Slovenia	0.87	85.56	0.79	
32	Uruguay	0.81	84.15	0.78	●
33	Cabo Verde	0.81	84.09	0.77	●
34	Bhutan	0.80	83.93	0.76	●
35	Hungary	0.78	83.43	0.76	
36	Portugal	0.74	82.47	0.75	
37	Estonia	0.73	82.09	0.74	
38	Costa Rica	0.67	80.63	0.74	
39	Croatia	0.61	79.34	0.73	
40	United States of America	0.61	79.19	0.72	
41	Latvia	0.57	78.31	0.71	
42	Cyprus	0.52	76.97	0.71	
43	Italy	0.51	76.76	0.70	
44	Mongolia	0.50	76.50	0.69	
45	Montenegro	0.49	76.15	0.69	
46	United Kingdom	0.48	76.11	0.68	○
47	Oman	0.48	75.94	0.67	
48	France	0.42	74.63	0.66	
49	Zambia	0.39	73.78	0.66	●
50	Chile	0.37	73.39	0.65	
51	Lesotho	0.33	72.22	0.64	●
52	Korea, Rep.	0.24	70.00	0.64	
53	Viet Nam	0.22	69.70	0.63	
54	Dominican Republic	0.19	68.77	0.62	●
55	Jamaica	0.18	68.51	0.61	
56	Bulgaria	0.18	68.50	0.61	
57	Romania	0.15	67.94	0.60	
58	Kuwait	0.14	67.67	0.59	
59	Trinidad and Tobago	0.10	66.67	0.59	
60	Armenia	0.07	65.90	0.58	
61	Argentina	0.06	65.63	0.57	
62	Albania	0.06	65.59	0.56	
63	Malaysia	0.05	65.44	0.56	
64	Ghana	0.02	64.66	0.55	
65	Spain	0.01	64.52	0.54	○
66	Belarus	−0.03	63.53	0.54	
67	Fiji	−0.03	63.50	0.53	
68	Moldova, Rep.	−0.03	63.32	0.52	
69	El Salvador	−0.04	63.08	0.51	
70	Gambia	−0.05	63.01	0.51	●
71	South Africa	−0.06	62.73	0.50	
72	Rwanda	−0.08	62.07	0.49	
73	Senegal	−0.09	62.02	0.49	
74	Serbia	−0.10	61.80	0.48	
75	Panama	−0.13	60.85	0.47	
76	Tanzania, United Rep.	−0.15	60.41	0.46	
77	Cambodia	−0.16	60.31	0.46	
78	Ecuador	−0.20	59.32	0.45	
79	Greece	−0.20	59.27	0.44	
80	Malawi	−0.22	58.61	0.44	
81	Nicaragua	−0.25	58.05	0.43	●
82	Mozambique	−0.27	57.45	0.42	
83	Brazil	−0.28	57.27	0.41	
84	Bolivia, Plurinational St.	−0.35	55.56	0.41	
85	Bosnia and Herzegovina	−0.37	55.11	0.40	
86	Angola	−0.37	54.95	0.39	●
87	TFYR of Macedonia	−0.37	54.91	0.39	
88	Kazakhstan	−0.38	54.73	0.38	
89	Saudi Arabia	−0.41	54.05	0.37	
90	Azerbaijan	−0.41	54.01	0.36	
91	Togo	−0.43	53.60	0.36	
92	Swaziland	−0.44	53.36	0.35	
93	Guyana	−0.44	53.24	0.34	
94	Georgia	−0.46	52.69	0.34	
95	Honduras	−0.47	52.63	0.33	
96	Morocco	−0.50	51.79	0.32	
97	Indonesia	−0.50	51.78	0.31	
98	Cameroon	−0.52	51.35	0.31	
99	China	−0.55	50.65	0.30	
100	Uzbekistan	−0.55	50.58	0.29	
101	Sri Lanka	−0.61	49.16	0.29	
102	Jordan	−0.62	48.92	0.28	
103	Paraguay	−0.67	47.59	0.27	
104	Zimbabwe	−0.69	47.09	0.26	
105	Guatemala	−0.69	46.97	0.26	
106	Madagascar	−0.71	46.49	0.25	
107	Mexico	−0.74	45.92	0.24	○
108	Russian Federation	−0.75	45.60	0.24	○
109	Burkina Faso	−0.75	45.54	0.23	
110	Ukraine	−0.76	45.42	0.22	
111	Peru	−0.77	45.07	0.21	
112	Uganda	−0.84	43.37	0.21	
113	Kyrgyzstan	−0.91	41.64	0.20	
114	Tunisia	−0.91	41.59	0.19	○
115	Côte d'Ivoire	−1.05	38.16	0.19	
116	Philippines	−1.06	37.96	0.18	
117	Venezuela, Bolivarian Rep.	−1.08	37.52	0.17	
118	Israel	−1.09	37.12	0.16	○
119	Tajikistan	−1.14	36.04	0.16	
120	Nepal	−1.14	35.93	0.15	
121	Kenya	−1.15	35.76	0.14	
122	Myanmar	−1.15	35.60	0.14	
123	Algeria	−1.17	35.22	0.13	
124	India	−1.19	34.79	0.12	○
125	Turkey	−1.19	34.61	0.11	○
126	Guinea	−1.23	33.85	0.11	
127	Colombia	−1.27	32.79	0.10	○
128	Iran, Islamic Rep.	−1.27	32.77	0.09	
129	Niger	−1.30	32.10	0.09	
130	Burundi	−1.30	32.06	0.08	
131	Thailand	−1.32	31.46	0.07	○
132	Bahrain	−1.34	30.97	0.06	○
133	Ethiopia	−1.39	29.68	0.06	
134	Bangladesh	−1.61	24.28	0.05	○
135	Egypt	−1.62	24.10	0.04	○
136	Mali	−1.69	22.48	0.04	○
137	Lebanon	−1.69	22.25	0.03	○
138	Nigeria	−2.08	12.74	0.02	○
139	Sudan	−2.20	9.74	0.01	○
140	Yemen	−2.35	6.07	0.01	○
141	Pakistan	−2.59	0.00	0.00	○

SOURCE: World Bank, *World Governance Indicators 2013*

NOTE: ● indicates a strength; ○ a weakness

1.1.2 Government effectiveness

Government effectiveness index | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Finland	2.17	100.00	1.00	●
2	Singapore	2.07	97.46	0.99	●
3	Denmark	1.97	94.68	0.99	●
4	Sweden	1.89	92.49	0.98	●
5	Norway	1.86	91.80	0.97	●
6	Switzerland	1.81	90.21	0.96	
7	Canada	1.77	89.28	0.96	
8	Netherlands	1.77	89.17	0.95	
9	New Zealand	1.75	88.59	0.94	
10	Hong Kong (China)	1.73	88.25	0.94	
11	Australia	1.62	85.31	0.93	
12	Luxembourg	1.62	85.07	0.92	
13	Japan	1.59	84.51	0.91	
14	Belgium	1.59	84.38	0.91	●
15	Austria	1.57	83.74	0.90	
16	Germany	1.52	82.44	0.89	
17	United States of America	1.50	81.98	0.89	
18	Iceland	1.48	81.49	0.88	
19	United Kingdom	1.47	81.16	0.87	
20	France	1.47	81.12	0.86	
21	Ireland	1.46	80.99	0.86	
22	Cyprus	1.35	77.92	0.85	
23	Barbados	1.35	77.75	0.84	●
24	Malta	1.25	75.14	0.84	
25	Chile	1.25	75.05	0.83	
26	Portugal	1.23	74.57	0.82	
27	Israel	1.22	74.30	0.81	
28	United Arab Emirates	1.17	72.95	0.81	
29	Spain	1.15	72.38	0.80	
30	Korea, Rep.	1.12	71.72	0.79	
31	Malaysia	1.10	71.14	0.79	
32	Qatar	1.07	70.34	0.78	
33	Slovenia	1.00	68.44	0.77	
34	Estonia	0.98	67.99	0.76	
35	Latvia	0.88	65.24	0.76	
36	Mauritius	0.88	65.11	0.75	
37	Czech Republic	0.88	65.08	0.74	
38	Lithuania	0.82	63.68	0.74	
39	Slovakia	0.78	62.40	0.73	
40	Poland	0.71	60.54	0.72	
41	Croatia	0.69	60.02	0.71	
42	Hungary	0.64	58.81	0.71	
43	Bahrain	0.58	57.18	0.70	
44	Georgia	0.53	55.79	0.69	
45	Costa Rica	0.47	54.10	0.69	
46	Italy	0.45	53.60	0.68	
47	Greece	0.45	53.53	0.67	
48	South Africa	0.43	53.13	0.66	
49	Uruguay	0.41	52.35	0.66	
50	Turkey	0.37	51.32	0.65	
51	Bhutan	0.36	51.09	0.64	●
52	Trinidad and Tobago	0.35	50.83	0.64	●
53	Panama	0.32	50.08	0.63	
54	Mexico	0.31	49.70	0.62	
55	Seychelles	0.28	49.02	0.61	
56	Botswana	0.28	48.90	0.61	
57	Thailand	0.21	47.14	0.60	
58	Oman	0.21	47.11	0.59	
59	Namibia	0.19	46.62	0.59	
60	Montenegro	0.16	45.64	0.58	
61	Bulgaria	0.15	45.53	0.57	
62	Cabo Verde	0.12	44.76	0.56	●
63	Armenia	0.07	43.16	0.56	
64	Saudi Arabia	0.06	43.03	0.55	
65	Philippines	0.06	43.00	0.54	
66	Colombia	0.04	42.55	0.54	
67	Rwanda	0.00	41.39	0.53	
68	Tunisia	0.00	41.39	0.52	
69	Jamaica	−0.02	40.96	0.51	
70	China	−0.03	40.60	0.51	
71	TFYR of Macedonia	−0.06	39.73	0.50	
72	Romania	−0.07	39.42	0.49	
73	Kuwait	−0.07	39.42	0.49	
74	Morocco	−0.07	39.41	0.48	
75	Brazil	−0.08	39.26	0.47	
76	Ghana	−0.09	39.07	0.46	
77	Serbia	−0.10	38.63	0.46	
78	Jordan	−0.11	38.36	0.45	
79	El Salvador	−0.13	37.86	0.44	
80	Peru	−0.14	37.55	0.44	
81	Guyana	−0.16	36.98	0.43	
82	India	−0.19	36.26	0.42	
83	Sri Lanka	−0.23	35.11	0.41	
84	Indonesia	−0.24	34.96	0.41	
85	Argentina	−0.29	33.55	0.40	
86	Viet Nam	−0.30	33.30	0.39	
87	Albania	−0.33	32.38	0.39	
88	Russian Federation	−0.36	31.63	0.38	
89	Lesotho	−0.38	31.07	0.37	
90	Lebanon	−0.39	30.82	0.36	
91	Bolivia, Plurinational St.	−0.40	30.64	0.36	
92	Moldova, Rep.	−0.40	30.61	0.35	
93	Swaziland	−0.44	29.38	0.34	
94	Bosnia and Herzegovina	−0.45	29.16	0.34	
95	Azerbaijan	−0.46	29.09	0.33	
96	Zambia	−0.48	28.54	0.32	
97	Senegal	−0.48	28.46	0.31	
98	Ecuador	−0.49	28.25	0.31	
99	Kenya	−0.49	28.25	0.30	
100	Dominican Republic	−0.49	28.10	0.29	
101	Ethiopia	−0.52	27.35	0.29	
102	Kazakhstan	−0.54	26.88	0.28	
103	Mongolia	−0.54	26.77	0.27	
104	Malawi	−0.56	26.24	0.26	
105	Uganda	−0.58	25.71	0.26	
106	Algeria	−0.60	25.14	0.25	
107	Burkina Faso	−0.62	24.71	0.24	
108	Mozambique	−0.65	23.86	0.24	
109	Ukraine	−0.65	23.82	0.23	
110	Tanzania, United Rep.	−0.67	23.23	0.22	
111	Kyrgyzstan	−0.69	22.66	0.21	
112	Iran, Islamic Rep.	−0.70	22.57	0.21	
113	Niger	−0.71	22.28	0.20	
114	Guatemala	−0.71	22.14	0.19	
115	Gambia	−0.72	21.98	0.19	
116	Honduras	−0.74	21.29	0.18	
117	Pakistan	−0.80	19.76	0.17	
118	Nicaragua	−0.82	19.32	0.16	
119	Bangladesh	−0.82	19.23	0.16	
120	Mali	−0.84	18.72	0.15	
121	Cameroon	−0.86	18.02	0.14	
122	Paraguay	−0.88	17.59	0.14	
123	Egypt	−0.89	17.25	0.13	
124	Cambodia	−0.92	16.46	0.12	
125	Nepal	−0.93	16.33	0.11	
126	Uzbekistan	−0.94	16.09	0.11	
127	Belarus	−0.94	15.90	0.10	○
128	Fiji	−0.96	15.51	0.09	○
129	Nigeria	−1.01	14.11	0.09	
130	Côte d'Ivoire	−1.04	13.39	0.08	○
131	Burundi	−1.07	12.34	0.07	
132	Tajikistan	−1.08	12.31	0.06	
133	Madagascar	−1.12	11.02	0.06	
134	Venezuela, Bolivarian Rep.	−1.14	10.68	0.05	
135	Zimbabwe	−1.14	10.62	0.04	○
136	Yemen	−1.20	8.85	0.04	○
137	Angola	−1.26	7.46	0.03	
138	Guinea	−1.32	5.71	0.02	
139	Togo	−1.37	4.34	0.01	○
140	Myanmar	−1.51	0.59	0.01	○
141	Sudan	−1.53	0.00	0.00	○

SOURCE: World Bank, *World Governance Indicators 2013*

NOTE: ● indicates a strength; ○ a weakness

1.2.1 Regulatory quality

Regulatory quality index | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Singapore	1.96	100.00	1.00	●
2	Hong Kong (China)	1.93	99.08	0.99	●
3	Sweden	1.89	98.13	0.99	●
4	Finland	1.85	97.03	0.98	
5	New Zealand	1.81	96.11	0.97	●
6	Denmark	1.80	95.79	0.96	●
7	Australia	1.79	95.45	0.96	●
8	Netherlands	1.77	94.83	0.95	
9	United Kingdom	1.77	94.82	0.94	
10	Luxembourg	1.76	94.73	0.94	
11	Canada	1.71	93.47	0.93	
12	Norway	1.65	91.86	0.92	
13	Switzerland	1.63	91.31	0.91	
14	Ireland	1.58	89.86	0.91	
15	Germany	1.55	89.10	0.90	
16	Chile	1.48	87.23	0.89	●
17	Austria	1.48	87.17	0.89	
18	Estonia	1.43	85.86	0.88	
19	Belgium	1.29	82.19	0.87	
20	Malta	1.29	82.08	0.86	
21	United States of America	1.26	81.30	0.86	
22	Israel	1.16	78.56	0.85	
23	France	1.15	78.38	0.84	
24	Lithuania	1.13	77.93	0.84	
25	Japan	1.10	77.15	0.83	
26	Iceland	1.09	76.87	0.82	
27	Czech Republic	1.09	76.76	0.81	
28	Poland	1.05	75.72	0.81	
29	Latvia	1.03	75.14	0.80	
30	Korea, Rep.	0.98	73.94	0.79	
31	Mauritius	0.94	72.81	0.79	
32	Spain	0.93	72.59	0.78	
33	Slovakia	0.91	72.16	0.77	
34	Cyprus	0.91	72.07	0.76	
35	Hungary	0.89	71.44	0.76	
36	Portugal	0.79	68.76	0.75	
37	United Arab Emirates	0.78	68.53	0.74	
38	Italy	0.77	68.29	0.74	
39	Qatar	0.74	67.53	0.73	
40	Georgia	0.74	67.39	0.72	
41	Botswana	0.66	65.27	0.71	●
42	Greece	0.62	64.24	0.71	
43	Malaysia	0.62	64.23	0.70	
44	Slovenia	0.61	63.98	0.69	
45	Bahrain	0.60	63.81	0.69	
46	Romania	0.59	63.49	0.68	
47	Costa Rica	0.58	63.16	0.67	
48	Uruguay	0.52	61.72	0.66	
49	Bulgaria	0.52	61.64	0.66	
50	Oman	0.47	60.36	0.65	
51	Mexico	0.46	60.01	0.64	
52	Peru	0.45	59.85	0.64	
53	Croatia	0.44	59.53	0.63	
54	Barbados	0.43	59.18	0.62	
55	Turkey	0.42	59.13	0.61	
56	South Africa	0.41	58.66	0.61	
57	Colombia	0.39	58.14	0.60	
58	Panama	0.37	57.67	0.59	
59	TFYR of Macedonia	0.32	56.43	0.59	
60	El Salvador	0.31	55.97	0.58	
61	Trinidad and Tobago	0.25	54.34	0.57	
62	Armenia	0.23	53.90	0.56	
63	Jamaica	0.23	53.83	0.56	
64	Thailand	0.21	53.49	0.55	
65	Albania	0.18	52.48	0.54	
66	Jordan	0.11	50.86	0.54	
67	Ghana	0.08	49.89	0.53	
68	Saudi Arabia	0.08	49.87	0.52	
69	Brazil	0.07	49.56	0.51	
70	Namibia	0.05	49.20	0.51	
71	Montenegro	0.05	49.12	0.50	
72	Rwanda	0.03	48.69	0.49	
73	Senegal	–0.05	46.53	0.49	
74	Philippines	–0.07	45.91	0.48	
75	Serbia	–0.07	45.82	0.47	
76	Bosnia and Herzegovina	–0.08	45.61	0.46	
77	Kuwait	–0.09	45.53	0.46	
78	Lebanon	–0.09	45.52	0.45	
79	Moldova, Rep.	–0.09	45.50	0.44	
80	Dominican Republic	–0.11	44.97	0.44	
81	Cabo Verde	–0.12	44.64	0.43	
82	Sri Lanka	–0.16	43.51	0.42	
83	Burkina Faso	–0.17	43.36	0.41	
84	Morocco	–0.17	43.31	0.41	
85	Indonesia	–0.20	42.57	0.40	
86	Honduras	–0.20	42.51	0.39	
87	Guatemala	–0.21	42.17	0.39	
88	Uganda	–0.24	41.51	0.38	
89	Mongolia	–0.29	40.20	0.37	
90	Seychelles	–0.29	40.01	0.36	
91	Nicaragua	–0.30	39.70	0.36	
92	China	–0.31	39.64	0.35	
93	Paraguay	–0.32	39.30	0.34	
94	Kyrgyzstan	–0.33	39.05	0.34	
95	Tanzania, United Rep.	–0.34	38.72	0.33	
96	Tunisia	–0.35	38.60	0.32	
97	Lesotho	–0.35	38.46	0.31	
98	Cambodia	–0.35	38.45	0.31	
99	Kenya	–0.35	38.40	0.30	
100	Swaziland	–0.36	38.17	0.29	
101	Gambia	–0.37	38.04	0.29	
102	Russian Federation	–0.37	37.98	0.28	○
103	Kazakhstan	–0.38	37.62	0.27	
104	Mozambique	–0.41	36.84	0.26	
105	Azerbaijan	–0.43	36.46	0.26	
106	Zambia	–0.47	35.36	0.25	
107	India	–0.47	35.21	0.24	
108	Mali	–0.50	34.45	0.24	
109	Fiji	–0.57	32.58	0.23	
110	Niger	–0.61	31.60	0.22	
111	Guyana	–0.62	31.44	0.21	
112	Ukraine	–0.64	30.82	0.21	
113	Viet Nam	–0.65	30.38	0.20	
114	Madagascar	–0.67	29.99	0.19	
115	Malawi	–0.68	29.71	0.19	
116	Egypt	–0.70	29.29	0.18	
117	Nigeria	–0.71	29.02	0.17	
118	Pakistan	–0.71	28.83	0.16	
119	Côte d'Ivoire	–0.73	28.35	0.16	
120	Yemen	–0.74	28.24	0.15	
121	Bolivia, Plurinational St.	–0.79	26.84	0.14	○
122	Nepal	–0.87	24.77	0.14	
123	Burundi	–0.87	24.62	0.13	
124	Bangladesh	–0.93	23.12	0.12	
125	Cameroon	–0.93	23.07	0.11	
126	Ecuador	–0.94	22.72	0.11	○
127	Togo	–0.95	22.50	0.10	
128	Argentina	–0.99	21.48	0.09	○
129	Guinea	–1.01	20.98	0.09	
130	Angola	–1.05	19.81	0.08	
131	Tajikistan	–1.07	19.37	0.07	
132	Belarus	–1.09	18.72	0.06	○
133	Bhutan	–1.10	18.60	0.06	○
134	Ethiopia	–1.13	17.62	0.05	
135	Algeria	–1.19	16.24	0.04	
136	Sudan	–1.44	9.38	0.04	
137	Iran, Islamic Rep.	–1.50	7.91	0.03	○
138	Myanmar	–1.51	7.63	0.02	
139	Uzbekistan	–1.63	4.37	0.01	○
140	Venezuela, Bolivarian Rep.	–1.64	4.08	0.01	○
141	Zimbabwe	–1.80	0.00	0.00	○

SOURCE: World Bank, *World Governance Indicators 2013*

NOTE: ● indicates a strength; ○ a weakness

1.2.2 Rule of law

Rule of law index | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Norway	1.97	100.00	1.00	●
2	Sweden	1.95	99.63	0.99	●
3	Finland	1.93	98.87	0.99	●
4	Denmark	1.87	97.48	0.98	●
5	New Zealand	1.86	97.13	0.97	●
6	Austria	1.83	96.30	0.96	●
7	Netherlands	1.81	95.77	0.96	
8	Switzerland	1.79	95.28	0.95	
9	Luxembourg	1.79	95.20	0.94	
10	Australia	1.75	94.30	0.94	
11	Singapore	1.74	94.02	0.93	
12	Canada	1.74	93.93	0.92	
13	Ireland	1.72	93.42	0.91	
14	United Kingdom	1.67	92.16	0.91	
15	Iceland	1.65	91.41	0.90	
16	Germany	1.62	90.62	0.89	
17	Hong Kong (China)	1.54	88.70	0.89	
18	United States of America	1.54	88.50	0.88	
19	Japan	1.41	85.14	0.87	
20	Belgium	1.40	84.97	0.86	
21	France	1.40	84.84	0.86	
22	Chile	1.34	83.25	0.85	
23	Malta	1.32	82.81	0.84	
24	Estonia	1.16	78.63	0.84	
25	Qatar	1.04	75.40	0.83	
26	Portugal	1.03	75.12	0.82	
27	Czech Republic	1.00	74.30	0.81	
28	Barbados	1.00	74.22	0.81	
29	Cyprus	1.00	74.20	0.80	
30	Spain	1.00	74.15	0.79	
31	Slovenia	0.97	73.41	0.79	
32	Israel	0.95	72.98	0.78	
33	Korea, Rep.	0.94	72.58	0.77	
34	Mauritius	0.90	71.63	0.76	
35	Lithuania	0.79	68.68	0.76	
36	Poland	0.79	68.53	0.75	
37	Latvia	0.75	67.48	0.74	
38	United Arab Emirates	0.64	64.75	0.74	
39	Botswana	0.59	63.42	0.73	●
40	Hungary	0.56	62.63	0.72	
41	Oman	0.56	62.44	0.71	●
42	Uruguay	0.50	61.03	0.71	
43	Costa Rica	0.50	60.82	0.70	
44	Cabo Verde	0.48	60.45	0.69	●
45	Malaysia	0.48	60.30	0.69	
46	Slovakia	0.45	59.51	0.68	
47	Greece	0.44	59.29	0.67	
48	Kuwait	0.39	57.95	0.66	
49	Jordan	0.39	57.94	0.66	
50	Italy	0.36	57.13	0.65	
51	Bahrain	0.35	56.99	0.64	
52	Saudi Arabia	0.26	54.68	0.64	
53	Croatia	0.26	54.68	0.63	
54	Namibia	0.25	54.27	0.62	
55	Bhutan	0.24	54.11	0.61	●
56	South Africa	0.13	51.01	0.61	
57	Ghana	0.11	50.52	0.60	●
58	Romania	0.11	50.47	0.59	
59	Turkey	0.08	49.76	0.59	
60	Seychelles	0.04	48.77	0.58	
61	Montenegro	0.02	48.17	0.57	
62	Georgia	–0.02	46.97	0.56	
63	India	–0.10	45.00	0.56	
64	Brazil	–0.12	44.46	0.55	
65	Thailand	–0.13	44.09	0.54	
66	Bulgaria	–0.14	43.98	0.54	
67	Rwanda	–0.15	43.71	0.53	
68	Bosnia and Herzegovina	–0.17	43.23	0.52	
69	Malawi	–0.19	42.57	0.51	
70	TFYR of Macedonia	–0.20	42.29	0.51	
71	Tunisia	–0.20	42.27	0.50	
72	Trinidad and Tobago	–0.22	41.70	0.49	
73	Panama	–0.24	41.26	0.49	
74	Morocco	–0.25	41.05	0.48	
75	Lesotho	–0.26	40.71	0.47	●
76	Sri Lanka	–0.27	40.41	0.46	
77	Senegal	–0.27	40.37	0.46	
78	Zambia	–0.31	39.48	0.45	
79	Armenia	–0.31	39.26	0.44	
80	Serbia	–0.34	38.51	0.44	
81	Uganda	–0.36	38.13	0.43	
82	Mongolia	–0.37	37.80	0.42	
83	Jamaica	–0.39	37.34	0.41	
84	Moldova, Rep.	–0.41	36.72	0.41	
85	Swaziland	–0.42	36.38	0.40	
86	Philippines	–0.43	36.27	0.39	
87	Colombia	–0.45	35.70	0.39	
88	China	–0.46	35.50	0.38	
89	Viet Nam	–0.49	34.67	0.37	
90	Tanzania, United Rep.	–0.50	34.22	0.36	
91	Guyana	–0.52	33.67	0.36	
92	Burkina Faso	–0.53	33.62	0.35	
93	Dominican Republic	–0.53	33.47	0.34	
94	Indonesia	–0.55	32.88	0.34	
95	Albania	–0.57	32.36	0.33	
96	Mexico	–0.58	32.26	0.32	
97	Gambia	–0.59	32.02	0.31	
98	Egypt	–0.60	31.62	0.31	
99	Peru	–0.61	31.42	0.30	
100	Ethiopia	–0.62	31.09	0.29	
101	Nicaragua	–0.65	30.43	0.29	
102	Kazakhstan	–0.67	29.89	0.28	
103	Azerbaijan	–0.67	29.71	0.27	
104	El Salvador	–0.68	29.67	0.26	
105	Algeria	–0.68	29.53	0.26	
106	Argentina	–0.73	28.17	0.25	
107	Kenya	–0.74	27.84	0.24	
108	Niger	–0.75	27.81	0.24	
109	Mali	–0.75	27.69	0.23	
110	Nepal	–0.76	27.53	0.22	
111	Lebanon	–0.78	26.98	0.21	
112	Russian Federation	–0.78	26.79	0.21	○
113	Paraguay	–0.82	25.74	0.20	
114	Ukraine	–0.83	25.68	0.19	○
115	Bangladesh	–0.83	25.51	0.19	
116	Fiji	–0.84	25.25	0.18	
117	Mozambique	–0.85	25.11	0.17	
118	Pakistan	–0.88	24.24	0.16	
119	Belarus	–0.89	23.99	0.16	○
120	Madagascar	–0.90	23.76	0.15	
121	Côte d'Ivoire	–0.93	22.84	0.14	
122	Ecuador	–0.95	22.35	0.14	
123	Iran, Islamic Rep.	–0.98	21.49	0.13	
124	Cambodia	–0.99	21.30	0.12	
125	Togo	–1.01	20.79	0.11	
126	Cameroon	–1.05	19.81	0.11	
127	Burundi	–1.06	19.38	0.10	
128	Bolivia, Plurinational St.	–1.07	19.14	0.09	○
129	Guatemala	–1.11	18.06	0.09	
130	Kyrgyzstan	–1.14	17.34	0.08	
131	Nigeria	–1.16	16.83	0.07	
132	Yemen	–1.16	16.81	0.06	
133	Uzbekistan	–1.20	15.60	0.06	○
134	Myanmar	–1.22	15.17	0.05	
135	Honduras	–1.23	14.95	0.04	○
136	Tajikistan	–1.24	14.67	0.04	○
137	Sudan	–1.25	14.31	0.03	○
138	Angola	–1.28	13.59	0.02	
139	Guinea	–1.42	9.81	0.01	○
140	Zimbabwe	–1.57	5.92	0.01	○
141	Venezuela, Bolivarian Rep.	–1.79	0.00	0.00	○

SOURCE: World Bank, *World Governance Indicators 2013*

NOTE: ● indicates a strength; ○ a weakness

1.2.3 Cost of redundancy dismissal

Sum of notice period and severance pay for redundancy dismissal (in salary weeks, averages for workers with 1, 5 and 10 years of tenure, with a minimum threshold of 8 weeks) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Austria	8.00	100.00	0.88	●
1	Bahrain	8.00	100.00	0.88	●
1	Cyprus	8.00	100.00	0.88	●
1	Denmark	8.00	100.00	0.88	●
1	Guinea	8.00	100.00	0.88	●
1	Hong Kong (China)	8.00	100.00	0.88	●
1	Italy	8.00	100.00	0.88	●
1	Japan	8.00	100.00	0.88	●
1	Jordan	8.00	100.00	0.88	●
1	Kenya	8.00	100.00	0.88	●
1	Malta	8.00	100.00	0.88	●
1	New Zealand	8.00	100.00	0.88	●
1	Oman	8.00	100.00	0.88	●
1	Romania	8.00	100.00	0.88	●
1	Serbia	8.00	100.00	0.88	●
1	Singapore	8.00	100.00	0.88	●
1	United Arab Emirates	8.00	100.00	0.88	●
1	United States of America	8.00	100.00	0.88	●
19	Bhutan	8.30	99.41	0.87	●
20	Bulgaria	8.60	98.81	0.84	●
20	Georgia	8.60	98.81	0.84	●
20	Kazakhstan	8.60	98.81	0.84	●
20	Mongolia	8.60	98.81	0.84	●
24	Lebanon	8.67	98.68	0.81	●
24	Netherlands	8.67	98.68	0.81	
24	Norway	8.67	98.68	0.81	
24	Uganda	8.67	98.68	0.81	●
28	Bosnia and Herzegovina	9.20	97.62	0.81	●
29	South Africa	9.33	97.36	0.79	
29	Tanzania, United Rep.	9.33	97.36	0.79	●
29	United Kingdom	9.33	97.36	0.79	
32	Fiji	9.63	96.76	0.77	●
32	Namibia	9.63	96.76	0.77	●
34	Canada	10.00	96.04	0.76	
35	Finland	10.10	95.84	0.75	
35	Iceland	10.10	95.84	0.75	
37	Switzerland	10.13	95.77	0.74	
38	Burkina Faso	10.43	95.18	0.74	●
39	Mauritius	10.63	94.78	0.73	
40	Slovenia	10.67	94.72	0.72	
41	Armenia	11.00	94.06	0.71	
42	Montenegro	11.23	93.59	0.71	
43	Peru	11.43	93.20	0.70	
44	Australia	11.67	92.73	0.69	
45	France	11.87	92.34	0.69	
46	Seychelles	11.90	92.27	0.68	●
47	Tunisia	12.07	91.94	0.67	
48	Madagascar	12.23	91.61	0.66	●
49	Estonia	12.90	90.29	0.66	
50	Latvia	12.97	90.16	0.64	
50	Rwanda	12.97	90.16	0.64	
50	TFYR of Macedonia	12.97	90.16	0.64	
53	Ukraine	13.00	90.09	0.63	
54	Côte d'Ivoire	13.07	89.96	0.62	●
55	Togo	13.10	89.89	0.61	●
56	Hungary	13.43	89.23	0.61	
57	Mali	13.63	88.84	0.60	●
58	Jamaica	14.00	88.11	0.59	
58	Niger	14.00	88.11	0.59	●
60	Ireland	14.33	87.45	0.58	○
61	Sweden	14.43	87.25	0.57	○
62	Swaziland	14.57	86.99	0.56	●
63	Senegal	14.80	86.53	0.56	●
64	Nicaragua	14.93	86.26	0.55	●
65	Lesotho	14.97	86.20	0.54	●
66	Croatia	15.10	85.93	0.54	
67	Nigeria	15.40	85.34	0.53	●
68	Brazil	15.43	85.27	0.52	
69	Tajikistan	15.53	85.07	0.51	
70	India	15.70	84.74	0.51	
71	Burundi	15.90	84.35	0.49	●
71	Greece	15.90	84.35	0.49	
73	Barbados	16.00	84.15	0.49	
74	Guyana	16.63	82.89	0.47	
74	Malawi	16.63	82.89	0.47	
76	Colombia	16.67	82.83	0.46	
77	Portugal	17.00	82.17	0.46	
78	Algeria	17.30	81.57	0.44	●
78	Kyrgyzstan	17.30	81.57	0.44	
80	Spain	17.37	81.44	0.44	○
81	Russian Federation	17.40	81.37	0.42	
81	Uzbekistan	17.40	81.37	0.42	
83	Panama	18.13	79.92	0.41	
84	Costa Rica	18.67	78.86	0.41	
85	Poland	18.77	78.67	0.40	
86	Slovakia	18.80	78.60	0.39	
87	Ethiopia	19.13	77.94	0.39	
88	Cambodia	19.33	77.54	0.38	
89	Saudi Arabia	19.47	77.28	0.37	
90	Belgium	19.67	76.88	0.36	○
91	Cameroon	19.87	76.49	0.36	
92	Myanmar	20.20	75.83	0.35	●
93	Czech Republic	20.27	75.69	0.34	○
94	Trinidad and Tobago	20.50	75.23	0.34	
95	Morocco	20.70	74.83	0.33	
96	Albania	20.80	74.64	0.31	
96	Uruguay	20.80	74.64	0.31	
98	Germany	21.57	73.12	0.31	○
99	Luxembourg	21.67	72.92	0.30	○
100	Botswana	21.67	72.92	0.29	
101	Azerbaijan	21.70	72.85	0.28	
101	Belarus	21.70	72.85	0.28	○
103	Mexico	22.00	72.26	0.27	
104	Moldova, Rep.	22.63	71.00	0.26	
105	El Salvador	22.87	70.54	0.26	
106	Iran, Islamic Rep.	23.10	70.08	0.25	
107	Qatar	23.23	69.82	0.24	
108	Malaysia	23.90	68.49	0.24	○
109	Viet Nam	24.57	67.17	0.23	
110	Lithuania	24.60	67.11	0.22	○
111	Sudan	25.97	64.40	0.21	
112	Gambia	26.00	64.33	0.21	
113	Paraguay	26.07	64.20	0.20	
114	Dominican Republic	26.17	64.00	0.19	
115	Guatemala	27.00	62.35	0.19	
116	Nepal	27.17	62.02	0.17	
116	Pakistan	27.17	62.02	0.17	
118	Chile	27.40	61.56	0.13	○
118	China	27.40	61.56	0.13	○
118	Israel	27.40	61.56	0.13	○
118	Korea, Rep.	27.40	61.56	0.13	○
118	Philippines	27.40	61.56	0.13	
118	Yemen	27.40	61.56	0.13	
124	Kuwait	28.10	60.17	0.12	○
125	Cabo Verde	29.50	57.40	0.11	
126	Turkey	29.77	56.87	0.11	○
127	Argentina	30.33	55.75	0.09	○
127	Honduras	30.33	55.75	0.09	○
129	Bangladesh	30.97	54.49	0.09	
130	Angola	31.03	54.36	0.08	
131	Ecuador	31.80	52.84	0.07	○
132	Thailand	35.97	44.58	0.06	○
133	Egypt	36.87	42.80	0.06	○
134	Mozambique	37.53	41.48	0.05	○
135	Ghana	49.77	17.24	0.04	○
136	Zambia	50.53	15.72	0.04	○
137	Indonesia	57.77	1.39	0.03	○
138	Bolivia, Plurinational St. (2013)	82.33	0.00	0.00	○
138	Sri Lanka	58.47	0.00	0.00	○
138	Venezuela, Bolivarian Rep. (2013)	82.33	0.00	0.00	○
138	Zimbabwe	82.33	0.00	0.00	○

SOURCE: World Bank. *Doing Business 2015: Going Beyond Efficiency*

NOTE: ● indicates a strength; ○ a weakness

1.3.1 Ease of starting a business

Ease of starting a business (distance to frontier) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	New Zealand	99.96	99.96	1.00	●
2	Canada	98.82	98.82	0.99	●
3	TFYR of Macedonia	98.08	98.08	0.99	●
4	Armenia	97.77	97.77	0.98	●
5	Georgia	97.73	97.73	0.97	●
6	Singapore	96.48	96.48	0.96	
7	Australia	96.47	96.47	0.96	●
8	Hong Kong (China)	96.38	96.38	0.95	
9	Kyrgyzstan	96.35	96.35	0.94	●
10	Portugal	96.27	96.27	0.94	●
11	Lithuania	96.22	96.22	0.93	●
12	Azerbaijan	95.54	95.54	0.92	●
13	Malaysia	94.90	94.90	0.91	
14	Belgium	94.42	94.42	0.91	●
15	Slovenia	94.39	94.39	0.90	
16	Korea, Rep.	94.36	94.36	0.89	
17	Burundi	94.25	94.25	0.89	●
18	Ireland	94.17	94.17	0.88	
19	Jamaica	94.13	94.13	0.87	●
20	Netherlands	94.08	94.08	0.86	
21	Norway	94.03	94.03	0.86	
22	Denmark	93.40	93.40	0.85	
23	Estonia	93.25	93.25	0.84	
24	Finland	93.10	93.10	0.84	
25	France	93.00	93.00	0.83	
26	Mauritius	92.47	92.47	0.82	
27	Iceland	92.35	92.35	0.81	
28	Sweden	92.30	92.30	0.81	
29	Russian Federation	92.17	92.17	0.80	
30	Moldova, Rep.	92.16	92.16	0.79	
31	Latvia	92.12	92.12	0.79	
32	Madagascar	92.02	92.02	0.78	●
33	Panama	91.93	91.93	0.76	
33	Romania	91.93	91.93	0.76	●
35	Belarus	91.88	91.88	0.76	
36	Albania	91.86	91.86	0.75	●
37	Mongolia	91.33	91.33	0.74	
38	Côte d'Ivoire	91.24	91.24	0.74	●
39	United Kingdom	91.23	91.23	0.73	
40	Italy	91.22	91.22	0.71	
40	United States of America	91.22	91.22	0.71	
42	Bulgaria	91.09	91.09	0.71	
43	Greece	90.71	90.71	0.70	
44	Israel	90.54	90.54	0.69	
45	Morocco	90.33	90.33	0.69	
46	Kazakhstan	90.19	90.19	0.68	
47	Montenegro	90.05	90.05	0.67	
48	Hungary	90.04	90.04	0.66	
49	United Arab Emirates	89.97	89.97	0.66	
50	Chile	89.83	89.83	0.65	
51	Uruguay	89.68	89.68	0.64	
52	South Africa	89.43	89.43	0.64	
53	Iran, Islamic Rep.	89.37	89.37	0.63	●
54	Cyprus	89.18	89.18	0.62	
55	Uzbekistan	89.00	89.00	0.61	●
56	Serbia	88.91	88.91	0.61	
57	Mexico	88.85	88.85	0.60	
58	Zambia	88.63	88.63	0.59	●
59	Switzerland	88.42	88.42	0.59	○
60	Trinidad and Tobago	88.33	88.33	0.58	
61	Egypt	88.14	88.14	0.57	
62	Spain	88.08	88.08	0.56	
63	Thailand	87.98	87.98	0.56	
64	Ukraine	87.35	87.35	0.55	
65	Slovakia	87.02	87.02	0.54	
66	Cabo Verde	87.00	87.00	0.54	●
67	Turkey	86.86	86.86	0.53	
68	Luxembourg	86.47	86.47	0.52	
69	Japan	86.21	86.21	0.51	
70	Colombia	86.13	86.13	0.51	
71	Poland	85.79	85.79	0.50	
72	Jordan	85.61	85.61	0.49	
73	Croatia	85.43	85.43	0.49	
74	Peru	85.10	85.10	0.48	
75	Senegal	85.04	85.04	0.47	
76	Bhutan	85.01	85.01	0.46	
77	Barbados	84.36	84.36	0.46	
78	Ghana	83.73	83.73	0.45	
79	Guatemala	83.72	83.72	0.44	
80	Guyana	83.62	83.62	0.44	
81	Tunisia	83.60	83.60	0.43	
82	Austria	83.42	83.42	0.42	○
83	Qatar	83.14	83.14	0.41	
84	Nepal	83.01	83.01	0.40	
84	Sri Lanka	83.01	83.01	0.40	
86	Tajikistan	83.00	83.00	0.39	
87	Mozambique	82.96	82.96	0.39	
88	Lesotho	82.84	82.84	0.38	
89	Saudi Arabia	82.71	82.71	0.37	
90	Czech Republic	82.58	82.58	0.36	○
91	Rwanda	81.66	81.66	0.36	
92	Dominican Republic	81.60	81.60	0.35	
93	Germany	81.38	81.38	0.34	○
94	Bangladesh	81.36	81.36	0.34	
95	Pakistan	80.92	80.92	0.33	
96	Costa Rica	80.90	80.90	0.32	
97	Lebanon	80.80	80.80	0.31	
98	Nicaragua	80.27	80.27	0.31	
99	El Salvador	79.87	79.87	0.30	
100	Oman	79.29	79.29	0.29	
101	Tanzania, United Rep.	78.85	78.85	0.29	
102	Viet Nam	77.68	77.68	0.28	
103	Paraguay	77.52	77.52	0.27	
104	Seychelles	77.48	77.48	0.26	
105	China	77.43	77.43	0.26	
106	Nigeria	77.13	77.13	0.25	
107	Bahrain	76.92	76.92	0.24	
108	Cameroon	76.41	76.41	0.24	
109	Togo	76.06	76.06	0.23	
110	Malta	75.29	75.29	0.22	○
111	Honduras	74.84	74.84	0.21	
112	Sudan	74.71	74.71	0.21	
113	Yemen	74.43	74.43	0.20	
114	Algeria	74.07	74.07	0.19	
115	Kenya	74.02	74.02	0.19	
116	Swaziland	73.47	73.47	0.18	
117	Argentina	72.58	72.58	0.17	
118	Bosnia and Herzegovina	72.51	72.51	0.16	○
119	Botswana	71.68	71.68	0.16	
120	Kuwait	71.30	71.30	0.15	
121	Burkina Faso	69.06	69.06	0.14	
122	Indonesia	68.84	68.84	0.14	
123	Namibia	68.67	68.67	0.13	○
124	Malawi	68.53	68.53	0.12	
125	India	68.42	68.42	0.11	○
126	Gambia	68.37	68.37	0.11	
127	Fiji	67.79	67.79	0.10	○
128	Philippines	67.23	67.23	0.09	○
129	Ecuador	65.31	65.31	0.09	○
130	Uganda	63.44	63.44	0.08	
131	Brazil	63.37	63.37	0.07	○
132	Ethiopia	63.15	63.15	0.06	
133	Mali	62.92	62.92	0.06	
134	Bolivia, Plurinational St.	59.07	59.07	0.05	○
135	Angola	56.56	56.56	0.04	
136	Guinea	55.44	55.44	0.04	
137	Niger	54.41	54.41	0.03	○
138	Zimbabwe	51.42	51.42	0.02	○
139	Venezuela, Bolivarian Rep.	45.23	45.23	0.01	○
140	Cambodia	41.23	41.23	0.01	○
141	Myanmar	22.85	22.85	0.00	○

SOURCE: World Bank. *Doing Business 2015: Going Beyond Efficiency*

NOTE: ● indicates a strength; ○ a weakness

1.3.2 Ease of resolving insolvency

Ease of resolving insolvency (distance to frontier) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Finland	93.85	93.85	1.00	●
2	Japan	93.74	93.74	0.99	●
3	Germany	91.78	91.78	0.99	●
4	United States of America	90.12	90.12	0.98	●
5	Korea, Rep.	90.06	90.06	0.97	●
6	Canada	89.17	89.17	0.96	●
7	Norway	85.62	85.62	0.96	●
8	Denmark	84.59	84.59	0.95	
9	Portugal	84.19	84.19	0.94	●
10	Belgium	83.87	83.87	0.94	●
11	Netherlands	83.77	83.77	0.93	
12	United Kingdom	82.04	82.04	0.92	
13	Australia	81.60	81.60	0.91	
14	Iceland	81.47	81.47	0.91	
15	Austria	78.84	78.84	0.90	
16	Sweden	78.43	78.43	0.89	
17	Singapore	77.94	77.94	0.89	
18	Czech Republic	77.50	77.50	0.88	
19	Ireland	76.90	76.90	0.87	
20	France	75.94	75.94	0.86	
21	Spain	75.89	75.89	0.86	
22	Israel	75.21	75.21	0.85	
23	Hong Kong (China)	75.06	75.06	0.84	
24	Barbados	74.09	74.09	0.84	●
25	Mexico	72.59	72.59	0.83	●
26	New Zealand	71.56	71.56	0.82	
27	Italy	71.29	71.29	0.81	
28	Colombia	70.00	70.00	0.81	
29	Slovakia	69.93	69.93	0.80	
30	Poland	69.73	69.73	0.79	
31	Montenegro	68.22	68.22	0.79	●
32	Bosnia and Herzegovina	66.21	66.21	0.78	●
33	TFYR of Macedonia	65.93	65.93	0.77	●
34	Malaysia	65.61	65.61	0.76	
35	Estonia	64.92	64.92	0.76	
36	Bulgaria	64.75	64.75	0.75	
37	South Africa	64.51	64.51	0.74	
38	Latvia	63.42	63.42	0.74	
39	Switzerland	63.10	63.10	0.73	
40	Slovenia	62.91	62.91	0.72	
41	Mauritius	62.81	62.81	0.71	
42	Albania	61.37	61.37	0.71	●
43	Thailand	58.73	58.73	0.70	
44	Romania	58.70	58.70	0.69	
45	Qatar	58.27	58.27	0.69	
46	Serbia	57.90	57.90	0.68	
47	Botswana	57.17	57.17	0.67	●
48	Philippines	56.74	56.74	0.66	●
49	Cyprus	56.68	56.68	0.66	
50	Greece	55.98	55.98	0.65	
51	China	55.31	55.31	0.64	
52	Tunisia	54.71	54.71	0.64	
53	Brazil	54.52	54.52	0.63	
54	Croatia	53.92	53.92	0.62	
55	Uruguay	53.47	53.47	0.61	
56	Moldova, Rep.	53.32	53.32	0.61	
57	Jamaica	53.29	53.29	0.60	
58	Seychelles	52.17	52.17	0.59	
59	Luxembourg	51.83	51.83	0.59	
60	Kazakhstan	51.45	51.45	0.58	
61	Hungary	49.78	49.78	0.57	
62	Russian Federation	49.69	49.69	0.56	
63	Trinidad and Tobago	48.97	48.97	0.56	
64	Lithuania	48.47	48.47	0.55	
65	Belarus	48.18	48.18	0.54	
66	Armenia	48.14	48.14	0.54	
67	Sri Lanka	47.81	47.81	0.53	
68	Chile	47.38	47.38	0.52	
69	Ethiopia	47.20	47.20	0.51	●
70	Indonesia	46.75	46.75	0.51	
71	Peru	46.57	46.57	0.50	
72	Uzbekistan	46.45	46.45	0.49	●
73	Pakistan	46.18	46.18	0.49	
74	El Salvador	46.02	46.02	0.48	
75	Swaziland	45.80	45.80	0.47	
76	Namibia	45.53	45.53	0.46	
77	Nepal	45.41	45.41	0.46	●
78	Argentina	45.10	45.10	0.45	
79	Cambodia	45.02	45.02	0.44	
80	Côte d'Ivoire	44.97	44.97	0.44	●
81	Malta	44.78	44.78	0.43	
82	Bahrain	44.24	44.24	0.42	
83	Costa Rica	43.95	43.95	0.41	
84	Mongolia	43.93	43.93	0.41	
85	Fiji	43.62	43.62	0.40	
86	United Arab Emirates	43.51	43.51	0.39	
87	Togo	43.12	43.12	0.39	●
88	Azerbaijan	43.02	43.02	0.38	
89	Zambia	43.01	43.01	0.37	
90	Bolivia, Plurinational St.	42.82	42.82	0.36	
91	Algeria	42.74	42.74	0.36	
92	Uganda	42.27	42.27	0.35	
93	Senegal	41.86	41.86	0.34	
94	Rwanda	41.77	41.77	0.34	
95	Gambia	41.51	41.51	0.33	
96	Viet Nam	41.27	41.27	0.32	
97	Tanzania, United Rep.	41.12	41.12	0.31	
98	Paraguay	40.87	40.87	0.31	
99	Mozambique	40.75	40.75	0.30	
100	Mali	40.35	40.35	0.29	
101	Turkey	40.00	40.00	0.29	
102	Nicaragua	39.64	39.64	0.28	
103	Oman	39.02	39.02	0.27	
104	Morocco	38.47	38.47	0.26	
105	Burkina Faso	38.08	38.08	0.26	
106	Guinea	37.62	37.62	0.25	●
107	Lesotho	37.51	37.51	0.24	
108	Georgia	36.48	36.48	0.24	
109	Cameroon	36.42	36.42	0.23	
110	Egypt	36.17	36.17	0.22	
111	Kuwait	36.02	36.02	0.21	
112	Niger	36.01	36.01	0.21	
113	Madagascar	34.43	34.43	0.20	
114	Nigeria	33.76	33.76	0.19	
115	Panama	33.66	33.66	0.19	
116	Kenya	33.31	33.31	0.18	
117	Lebanon	33.03	33.03	0.17	○
118	India	32.60	32.60	0.16	
119	Iran, Islamic Rep.	32.38	32.38	0.16	
120	Honduras	31.83	31.83	0.15	○
121	Ukraine	31.17	31.17	0.14	○
122	Burundi	30.55	30.55	0.14	
123	Jordan	30.17	30.17	0.13	○
124	Bangladesh	29.49	29.49	0.12	
125	Zimbabwe	29.28	29.28	0.11	
126	Tajikistan	29.26	29.26	0.11	
127	Guyana	28.50	28.50	0.10	○
128	Ecuador	28.36	28.36	0.09	○
129	Yemen	27.46	27.46	0.09	
130	Guatemala	27.37	27.37	0.08	○
131	Sudan	26.54	26.54	0.07	
132	Kyrgyzstan	24.38	24.38	0.06	○
133	Dominican Republic	23.75	23.75	0.06	○
134	Myanmar	23.51	23.51	0.05	
135	Ghana	22.45	22.45	0.04	○
136	Saudi Arabia	21.67	21.67	0.04	○
137	Venezuela, Bolivarian Rep.	19.20	19.20	0.03	
138	Malawi	18.99	18.99	0.02	○
139	Angola	0.00	0.00	0.00	○
139	Bhutan	0.00	0.00	0.00	○
139	Cabo Verde	0.00	0.00	0.00	○

SOURCE: World Bank. *Doing Business 2015: Going Beyond Efficiency*

NOTE: ● indicates a strength; ○ a weakness

1.3.3 Ease of paying taxes

Ease of paying taxes (distance to frontier) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Qatar	99.44	99.44	0.99	●
1	United Arab Emirates	99.44	99.44	0.99	●
3	Saudi Arabia	99.23	99.23	0.99	●
4	Hong Kong (China)	98.51	98.51	0.98	
5	Singapore	97.19	97.19	0.97	
6	Ireland	95.07	95.07	0.96	●
7	TFYR of Macedonia	94.17	94.17	0.96	●
8	Bahrain	93.88	93.88	0.95	●
9	Canada	93.00	93.00	0.94	
10	Oman	92.91	92.91	0.94	●
11	Kuwait	92.48	92.48	0.93	●
12	Denmark	91.94	91.94	0.92	
13	Mauritius	91.92	91.92	0.91	●
14	Norway	90.80	90.80	0.91	
15	United Kingdom	90.52	90.52	0.90	
16	Kazakhstan	90.04	90.04	0.89	●
17	Switzerland	89.05	89.05	0.89	
18	South Africa	88.73	88.73	0.88	●
19	Luxembourg	88.58	88.58	0.87	
20	Finland	88.36	88.36	0.86	
21	New Zealand	88.04	88.04	0.86	
22	Netherlands	86.76	86.76	0.85	
23	Latvia	86.19	86.19	0.84	
24	Korea, Rep.	86.09	86.09	0.84	
25	Malta	85.81	85.81	0.83	
26	Rwanda	85.79	85.79	0.82	●
27	Estonia	84.93	84.93	0.81	
28	Chile	84.50	84.50	0.81	
29	Malaysia	83.95	83.95	0.80	
30	Azerbaijan	83.77	83.77	0.79	●
31	Sweden	83.30	83.30	0.79	
32	Croatia	82.92	82.92	0.78	●
33	Georgia	82.76	82.76	0.77	
34	Australia	82.48	82.48	0.76	
35	Lebanon	82.44	82.44	0.76	
36	Armenia	82.10	82.10	0.75	
37	Slovenia	81.94	81.94	0.74	
38	Seychelles	81.50	81.50	0.74	●
39	Lithuania	81.24	81.24	0.73	
40	Jordan	81.19	81.19	0.72	●
41	Iceland	80.86	80.86	0.71	
42	United States of America	80.84	80.84	0.71	
43	Russian Federation	80.63	80.63	0.70	
44	Cyprus	80.53	80.53	0.69	
45	Romania	80.09	80.09	0.69	
46	Guatemala	80.04	80.04	0.68	●
47	Turkey	79.80	79.80	0.67	
48	Peru	79.43	79.43	0.66	
49	Greece	78.30	78.30	0.66	
50	Belarus	78.29	78.29	0.65	
51	Thailand	77.99	77.99	0.64	
52	Portugal	77.84	77.84	0.64	
53	Madagascar	77.78	77.78	0.63	●
54	Morocco	77.69	77.69	0.62	
55	Botswana	77.47	77.47	0.61	
56	Germany	77.02	77.02	0.61	
57	Moldova, Rep.	76.57	76.57	0.60	
58	Austria	76.36	76.36	0.59	○
59	Swaziland	75.76	75.76	0.59	●
60	Spain	75.25	75.25	0.58	
61	Zambia	74.52	74.52	0.57	●
62	Dominican Republic	74.24	74.24	0.56	
63	Belgium	74.18	74.18	0.56	
64	Tunisia	74.11	74.11	0.55	
65	Bangladesh	73.98	73.98	0.54	●
66	Mongolia	73.79	73.79	0.54	
67	Namibia	73.57	73.57	0.53	
68	Bhutan	73.55	73.55	0.52	●
69	Poland	73.51	73.51	0.51	
70	Hungary	73.27	73.27	0.51	
71	Bulgaria	73.18	73.18	0.50	
72	Cambodia	73.06	73.06	0.49	●
73	Cabo Verde	73.05	73.05	0.49	
74	Barbados	72.99	72.99	0.48	
75	France	72.12	72.12	0.47	○
76	Israel	71.88	71.88	0.46	○
77	Montenegro	71.59	71.59	0.46	
78	Slovakia	71.57	71.57	0.45	
79	Ghana	71.53	71.53	0.44	
80	Kenya	71.49	71.49	0.44	
81	Malawi	71.37	71.37	0.43	
82	Uganda	71.32	71.32	0.42	
83	Mexico	71.17	71.17	0.41	
84	Fiji	70.73	70.73	0.41	
85	Ukraine	70.33	70.33	0.40	
86	Lesotho	69.72	69.72	0.39	
87	Paraguay	69.45	69.45	0.39	
88	Ethiopia	69.11	69.11	0.38	
89	Trinidad and Tobago	68.98	68.98	0.37	
90	Guyana	68.69	68.69	0.36	
91	Myanmar	68.64	68.64	0.36	●
92	Uzbekistan	68.30	68.30	0.35	
93	Czech Republic	67.66	67.66	0.34	○
94	China	67.44	67.44	0.34	
95	Costa Rica	67.27	67.27	0.33	
96	Japan	67.19	67.19	0.32	○
97	Mozambique	66.85	66.85	0.31	
98	Burundi	66.78	66.78	0.30	
98	Iran, Islamic Rep.	66.78	66.78	0.30	
100	Nepal	66.52	66.52	0.29	
101	Philippines	66.46	66.46	0.29	
102	Albania	64.75	64.75	0.28	
103	Yemen	63.62	63.62	0.27	●
104	Kyrgyzstan	63.15	63.15	0.26	
105	Ecuador	62.84	62.84	0.26	
106	Sudan	62.34	62.34	0.25	●
107	Uruguay	62.32	62.32	0.24	
108	Italy	62.13	62.13	0.24	○
109	Zimbabwe	61.39	61.39	0.23	
110	Angola	60.40	60.40	0.22	
111	Mali	60.16	60.16	0.21	
112	Colombia	59.71	59.71	0.21	○
113	Jamaica	59.01	59.01	0.20	○
114	Tanzania, United Rep.	58.95	58.95	0.19	
115	Egypt	58.84	58.84	0.19	
116	Bosnia and Herzegovina	58.22	58.22	0.18	○
117	Burkina Faso	58.08	58.08	0.17	
118	Honduras	57.92	57.92	0.16	
119	Niger	57.07	57.07	0.16	
120	India	55.53	55.53	0.15	
121	Sri Lanka	55.00	55.00	0.14	○
122	Indonesia	53.66	53.66	0.14	
123	El Salvador	52.31	52.31	0.13	
124	Togo	50.81	50.81	0.12	
125	Nicaragua	49.51	49.51	0.11	
126	Serbia	48.90	48.90	0.11	○
127	Panama	48.60	48.60	0.10	○
128	Tajikistan	46.06	46.06	0.09	
129	Argentina	44.99	44.99	0.09	○
130	Pakistan	44.46	44.46	0.08	○
131	Viet Nam	43.61	43.61	0.07	○
132	Côte d'Ivoire	42.73	42.73	0.06	○
133	Algeria	41.63	41.63	0.06	
134	Brazil	41.31	41.31	0.05	○
135	Nigeria	39.15	39.15	0.04	
136	Gambia	38.36	38.36	0.04	○
137	Cameroon	36.34	36.34	0.03	○
138	Senegal	30.94	30.94	0.02	○
139	Guinea	28.27	28.27	0.01	○
140	Venezuela, Bolivarian Rep.	13.37	13.37	0.01	○
141	Bolivia, Plurinational St.	12.18	12.18	0.00	○

SOURCE: World Bank. *Doing Business 2015: Going Beyond Efficiency*

NOTE: ● indicates a strength; ○ a weakness

2.1.1 Expenditure on education

Government expenditure on education (% of GDP) | 2011

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Lesotho (2008)	12.98	100.00	1.00	●
2	Botswana (2009)	9.49	72.95	0.99	●
3	Denmark	8.75	67.21	0.98	●
4	Namibia (2010)	8.50	65.28	0.98	●
5	Moldova, Rep. (2012)	8.35	64.14	0.97	●
6	Ghana	8.14	62.53	0.96	●
7	Malta	7.96	61.16	0.95	●
8	Swaziland	7.83	60.12	0.95	●
9	Thailand (2012)	7.57	58.11	0.94	●
10	Iceland	7.36	56.49	0.93	
11	New Zealand (2012)	7.35	56.45	0.92	
12	Cyprus	7.24	55.58	0.91	●
13	Venezuela, Bolivarian Rep. (2009)	6.87	52.73	0.91	●
14	Costa Rica (2013)	6.87	52.67	0.90	●
15	Sweden	6.82	52.31	0.89	
16	Kyrgyzstan	6.79	52.08	0.88	●
17	Finland	6.76	51.86	0.88	
18	Ukraine (2012)	6.66	51.08	0.87	●
19	Kenya (2010)	6.64	50.91	0.86	●
20	Morocco (2013)	6.59	50.54	0.85	●
21	Norway	6.55	50.24	0.84	
22	Belgium	6.55	50.21	0.84	
23	Bolivia, Plurinational St. (2012)	6.44	49.35	0.83	●
24	Viet Nam (2012)	6.30	48.31	0.82	●
25	Jamaica (2013)	6.26	47.95	0.81	●
26	South Africa (2013)	6.23	47.77	0.81	●
27	Tunisia (2012)	6.22	47.70	0.80	●
28	Tanzania, United Rep. (2010)	6.18	47.37	0.79	●
29	Ireland	6.15	47.16	0.78	
30	United Kingdom	6.03	46.22	0.78	
31	Malaysia	5.94	45.51	0.77	
32	Netherlands	5.93	45.43	0.76	
33	Brazil (2010)	5.82	44.59	0.75	
34	Burundi (2012)	5.82	44.58	0.74	●
35	Austria	5.80	44.39	0.74	
36	Slovenia	5.68	43.49	0.73	
37	France	5.68	43.45	0.72	
38	Israel	5.64	43.16	0.71	
39	Barbados (2012)	5.61	42.95	0.71	
40	Senegal (2010)	5.60	42.87	0.70	●
41	Bhutan (2013)	5.48	41.92	0.69	●
42	Mongolia	5.48	41.91	0.68	
43	Malawi	5.35	40.96	0.67	●
44	Switzerland	5.28	40.37	0.67	
45	Canada	5.27	40.34	0.66	
46	Portugal	5.27	40.33	0.65	
47	United States of America	5.23	39.98	0.64	
48	Lithuania	5.17	39.56	0.64	
49	Estonia	5.16	39.44	0.63	
50	Mexico	5.15	39.36	0.62	
51	Saudi Arabia (2008)	5.14	39.29	0.61	
52	Argentina (2012)	5.14	39.29	0.60	
53	Belarus (2012)	5.12	39.16	0.60	
54	Australia	5.11	39.08	0.59	
55	Rwanda (2013)	5.09	38.91	0.58	
56	Cabo Verde	5.04	38.56	0.57	●
57	Mozambique (2006)	5.01	38.28	0.57	●
58	Germany	4.98	38.07	0.56	
59	Spain	4.98	38.06	0.55	
60	Paraguay	4.97	37.97	0.54	●
61	Poland	4.94	37.78	0.53	
62	Latvia	4.93	37.72	0.53	
63	Colombia (2013)	4.93	37.68	0.52	
64	Korea, Rep.	4.86	37.18	0.51	
65	Mali	4.81	36.75	0.50	
66	Ethiopia (2010)	4.74	36.20	0.50	●
67	Nepal (2010)	4.72	36.04	0.49	●
68	Hungary	4.71	36.00	0.48	
69	Côte d'Ivoire (2008)	4.60	35.15	0.47	●
70	Yemen (2008)	4.56	34.83	0.47	●
71	Chile (2012)	4.55	34.77	0.46	
72	Czech Republic	4.51	34.41	0.45	
73	Niger (2012)	4.44	33.86	0.44	
74	Uruguay	4.42	33.76	0.43	
75	Nicaragua (2010)	4.39	33.54	0.43	
76	Ecuador (2012)	4.36	33.26	0.42	
77	Algeria (2008)	4.34	33.10	0.41	
78	Italy	4.29	32.77	0.40	○
79	Croatia	4.21	32.09	0.40	○
80	Oman (2009)	4.20	32.04	0.39	
81	Fiji	4.20	32.01	0.38	
82	Russian Federation (2008)	4.10	31.28	0.37	
83	Greece (2005)	4.09	31.19	0.36	
84	Gambia (2012)	4.08	31.13	0.36	
85	Slovakia	4.06	30.93	0.35	
86	Tajikistan (2012)	4.02	30.63	0.34	
87	Togo (2012)	4.01	30.59	0.33	
88	Japan (2012)	3.85	29.32	0.33	○
89	Bulgaria	3.82	29.10	0.32	○
90	India (2012)	3.79	28.88	0.31	
91	Dominican Republic (2013)	3.78	28.76	0.30	
92	Egypt (2008)	3.76	28.64	0.29	
93	Hong Kong (China) (2013)	3.76	28.63	0.29	○
94	Kuwait (2006)	3.76	28.63	0.28	
95	Iran, Islamic Rep. (2013)	3.68	28.01	0.27	
96	Mauritius (2013)	3.67	27.96	0.26	
97	Seychelles	3.63	27.61	0.26	
98	Indonesia (2012)	3.57	27.14	0.25	
99	Angola (2010)	3.48	26.44	0.24	●
100	Burkina Faso	3.43	26.05	0.23	
101	El Salvador	3.42	25.98	0.22	
102	Panama	3.29	25.02	0.22	
103	Uganda (2012)	3.28	24.91	0.21	
104	Peru (2013)	3.28	24.90	0.20	
105	Albania (2007)	3.27	24.83	0.19	
106	Guyana (2012)	3.19	24.25	0.19	
107	Romania	3.07	23.32	0.18	○
108	Kazakhstan (2009)	3.06	23.22	0.17	
109	Cameroon (2012)	2.97	22.48	0.16	
110	Singapore (2013)	2.94	22.25	0.16	○
111	Turkey (2006)	2.86	21.68	0.15	○
112	Guatemala (2013)	2.85	21.55	0.14	
113	Madagascar (2012)	2.74	20.76	0.13	
114	Bahrain (2012)	2.68	20.26	0.12	○
115	Philippines (2009)	2.65	20.06	0.12	○
116	Cambodia (2010)	2.60	19.68	0.11	○
117	Lebanon (2013)	2.57	19.44	0.10	○
118	Pakistan (2013)	2.49	18.79	0.09	
119	Guinea (2012)	2.47	18.66	0.09	
120	Qatar (2008)	2.45	18.48	0.08	○
121	Azerbaijan	2.44	18.38	0.07	○
122	Armenia (2013)	2.25	16.95	0.06	○
123	Bangladesh (2009)	2.23	16.82	0.05	
124	Sudan (2009)	2.23	16.80	0.05	
125	Georgia (2012)	1.98	14.88	0.04	○
126	Zimbabwe (2010)	1.97	14.75	0.03	○
127	Sri Lanka (2012)	1.72	12.87	0.02	○
128	Zambia (2008)	1.35	9.94	0.02	○
129	Myanmar	0.79	5.61	0.01	○
130	Serbia (2012)	0.06	0.00	0.00	○
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	China	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Luxembourg	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	TFYR of Macedonia	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

2.1.2 Government expenditure on education per pupil, secondary

Government expenditure on education per pupil, secondary (% of GDP per capita) | 2011

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Mozambique (2006)	85.98	100.00	1.00	●
2	Malta	66.43	75.83	0.99	●
3	Lesotho (2008)	51.21	57.01	0.98	●
4	Niger (2012)	46.66	51.39	0.97	●
5	Rwanda (2013)	41.79	45.36	0.96	●
6	Cyprus	41.74	45.30	0.95	●
7	Swaziland	38.69	41.53	0.95	●
8	Belgium	38.58	41.39	0.94	●
9	Moldova, Rep. (2012)	37.77	40.40	0.93	●
10	Thailand (2012)	37.41	39.95	0.92	●
11	Morocco (2012)	36.49	38.81	0.91	●
12	Finland	36.20	38.45	0.90	
13	Bhutan (2013)	33.55	35.17	0.89	●
14	Portugal	33.52	35.14	0.88	●
15	Malawi	33.18	34.72	0.87	●
16	Burundi (2012)	33.05	34.55	0.86	●
17	Botswana (2009)	33.00	34.50	0.86	●
18	Sweden	32.66	34.07	0.85	
19	United Kingdom	31.48	32.62	0.84	
20	Slovenia	31.43	32.56	0.83	
21	Mali	31.18	32.24	0.82	●
22	Austria	30.55	31.46	0.81	
23	Ukraine (2012)	30.14	30.96	0.80	
24	Denmark	30.13	30.94	0.79	
25	Jamaica (2013)	29.41	30.05	0.78	●
26	Senegal (2010)	28.95	29.49	0.77	●
27	Ireland	28.94	29.48	0.77	
28	France	27.95	28.25	0.76	
29	Switzerland	27.49	27.68	0.75	
30	Estonia	27.49	27.68	0.74	
31	Spain	26.49	26.44	0.73	
32	Norway	26.17	26.05	0.72	
33	Netherlands	25.89	25.70	0.71	
34	Latvia	25.82	25.62	0.70	
35	Japan (2012)	25.75	25.53	0.69	
36	Ghana	25.73	25.50	0.68	●
37	New Zealand (2012)	25.17	24.81	0.68	
38	Czech Republic	25.15	24.79	0.67	
39	Barbados (2010)	24.97	24.56	0.66	
40	Costa Rica (2013)	24.82	24.38	0.65	
41	Tunisia (2008)	24.36	23.80	0.64	
42	Poland	24.20	23.61	0.63	
43	Germany	24.11	23.50	0.62	
44	United States of America	23.95	23.30	0.61	
45	Uganda (2012)	23.42	22.65	0.60	●
46	Italy	23.39	22.61	0.59	
47	Korea, Rep.	23.04	22.18	0.59	
48	Bulgaria	22.22	21.16	0.58	
49	Brazil (2010)	21.57	20.36	0.57	
50	South Africa (2012)	21.56	20.34	0.56	
51	Greece (2005)	21.53	20.31	0.55	
52	Kenya (2006)	21.17	19.86	0.54	
53	Iceland	21.17	19.86	0.53	
54	Hungary	20.95	19.59	0.52	
55	Kuwait	20.94	19.58	0.51	
56	Bolivia, Plurinational St. (2012)	20.33	18.82	0.50	●
57	Malaysia	19.87	18.25	0.50	
58	Cameroon (2012)	19.74	18.09	0.49	●
59	Argentina (2012)	19.64	17.97	0.48	
60	Lithuania	19.47	17.76	0.47	
61	Mauritius (2012)	19.03	17.22	0.46	
62	Ecuador (2013)	18.99	17.17	0.45	
63	Hong Kong (China) (2013)	18.96	17.13	0.44	
64	Slovakia	18.41	16.46	0.43	
65	Canada	18.32	16.34	0.42	○
66	Luxembourg	18.32	16.34	0.41	
67	Saudi Arabia (2007)	18.11	16.09	0.41	
68	Chile (2012)	18.06	16.03	0.40	
69	Australia	17.94	15.87	0.39	○
70	Mongolia (2010)	17.82	15.72	0.38	
71	Armenia (2012)	17.74	15.62	0.37	
72	Paraguay	17.59	15.44	0.36	
73	Colombia (2013)	17.04	14.75	0.35	
74	Singapore (2010)	16.68	14.32	0.34	○
75	Burkina Faso (2012)	16.63	14.26	0.33	
76	Venezuela, Bolivarian Rep. (2009)	16.61	14.22	0.32	
77	Tanzania, United Rep. (2010)	16.25	13.78	0.32	
78	Mexico	15.91	13.36	0.31	
79	Oman	15.89	13.34	0.30	
80	Iran, Islamic Rep. (2012)	15.86	13.30	0.29	
81	Namibia (2008)	15.76	13.18	0.28	
82	India	15.53	12.89	0.27	
83	Georgia (2008)	15.49	12.85	0.26	
84	Israel	15.48	12.82	0.25	○
85	Togo	15.42	12.76	0.24	
86	Jordan	15.06	12.31	0.23	○
87	Cabo Verde	14.78	11.97	0.23	
88	Bangladesh	13.93	10.92	0.22	
89	Serbia (2012)	13.93	10.91	0.21	○
90	Gambia (2010)	13.14	9.94	0.20	
91	Nepal (2009)	12.17	8.73	0.19	
92	Yemen	12.13	8.69	0.18	
93	Romania	11.90	8.40	0.17	○
94	El Salvador (2010)	11.31	7.67	0.16	
95	Indonesia (2012)	10.69	6.91	0.15	
96	Uruguay (2006)	10.69	6.90	0.14	○
97	Ethiopia (2010)	10.40	6.55	0.14	
98	Peru (2013)	10.38	6.53	0.13	○
99	Pakistan (2013)	10.38	6.52	0.12	
100	Qatar (2009)	10.27	6.39	0.11	○
101	Guinea (2012)	9.89	5.92	0.10	
102	Guyana (2012)	9.83	5.84	0.09	○
103	Panama	9.66	5.64	0.08	○
104	Philippines (2008)	9.14	4.99	0.07	○
105	Dominican Republic (2012)	8.46	4.15	0.06	○
106	Madagascar (2012)	8.42	4.10	0.05	
107	Nicaragua (2010)	7.28	2.69	0.05	○
108	Sri Lanka (2012)	6.87	2.18	0.04	○
109	Seychelles	6.79	2.08	0.03	○
110	Fiji	5.75	0.80	0.02	○
111	Guatemala (2012)	5.12	0.01	0.01	○
112	Lebanon (2013)	5.10	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Algeria	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Azerbaijan	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Belarus	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	China	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Croatia	n/a	n/a	n/a	
n/a	Egypt	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Kazakhstan	n/a	n/a	n/a	
n/a	Kyrgyzstan	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Russian Federation	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	TFYR of Macedonia	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Turkey	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Viet Nam	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

2.1.3 School life expectancy

School life expectancy, primary to tertiary education (years) | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Australia	20.22	100.00	1.00	●
2	New Zealand	19.16	92.81	0.99	●
3	Iceland	18.98	91.59	0.98	●
4	Denmark	18.69	89.65	0.98	●
5	Ireland	18.57	88.84	0.97	●
6	Argentina	17.95	84.64	0.96	●
7	Netherlands	17.92	84.47	0.95	
8	Greece	17.63	82.48	0.95	●
9	Norway	17.49	81.56	0.94	
10	Spain	17.35	80.57	0.93	●
11	Finland	17.07	78.70	0.92	
12	Korea, Rep.	16.87	77.39	0.92	
13	Slovenia	16.81	76.92	0.91	
14	Estonia	16.48	74.75	0.90	
15	Germany	16.46	74.56	0.89	
16	United States of America	16.44	74.42	0.89	
17	Lithuania	16.39	74.10	0.88	●
18	Belgium	16.33	73.72	0.87	
19	Czech Republic	16.33	73.69	0.86	
20	Portugal	16.31	73.60	0.85	
21	Saudi Arabia (2013)	16.27	73.33	0.85	●
22	United Kingdom	16.18	72.71	0.84	
23	Italy	16.04	71.76	0.83	
24	France	16.00	71.49	0.82	
25	Israel	15.95	71.16	0.82	
26	Sweden	15.82	70.23	0.81	
27	Switzerland	15.79	70.06	0.80	
28	Austria	15.75	69.76	0.79	
29	Belarus (2013)	15.66	69.18	0.79	●
30	Hong Kong (China) (2013)	15.60	68.75	0.78	
31	Mauritius	15.58	68.61	0.77	
32	Uruguay (2010)	15.50	68.11	0.76	●
33	Poland	15.47	67.86	0.76	
34	Barbados (2011)	15.42	67.56	0.75	
35	Hungary	15.39	67.34	0.74	
36	Japan	15.33	66.92	0.73	
37	Chile	15.25	66.38	0.73	
38	Latvia	15.24	66.36	0.72	
39	Montenegro (2010)	15.18	65.93	0.71	
40	Ukraine (2013)	15.14	65.67	0.70	
41	Iran, Islamic Rep.	15.09	65.36	0.69	●
42	Slovakia	15.06	65.15	0.69	
43	Kazakhstan	15.02	64.88	0.68	
44	Croatia	14.81	63.42	0.67	
45	Russian Federation	14.69	62.61	0.66	
46	Kuwait (2004)	14.64	62.26	0.66	
47	Tunisia (2011)	14.62	62.18	0.65	
48	Mongolia (2010)	14.59	61.98	0.64	
49	Turkey	14.54	61.64	0.63	
50	Malta	14.41	60.71	0.63	
51	Serbia (2013)	14.39	60.58	0.62	
52	Bulgaria	14.35	60.36	0.61	
53	Venezuela, Bolivarian Rep. (2009)	14.22	59.43	0.60	●
54	Romania (2011)	14.21	59.39	0.60	
55	Brazil (2005)	14.19	59.22	0.59	
56	Ecuador	14.17	59.12	0.58	
57	Cyprus	13.97	57.73	0.57	
58	Algeria (2011)	13.97	57.73	0.56	●
59	Fiji (2004)	13.88	57.17	0.56	
60	Costa Rica (2013)	13.86	57.03	0.55	
61	Luxembourg	13.85	56.94	0.54	
62	Georgia (2013)	13.80	56.59	0.53	
63	Qatar (2005)	13.79	56.52	0.53	
64	Lebanon (2013)	13.75	56.30	0.52	
65	Sri Lanka	13.71	56.02	0.51	
66	Oman (2011)	13.64	55.51	0.50	
67	South Africa	13.56	54.97	0.50	
68	Colombia (2010)	13.55	54.89	0.49	
69	Egypt	13.53	54.77	0.48	
70	Jordan	13.51	54.64	0.47	
71	Thailand	13.47	54.39	0.47	
72	Cabo Verde (2013)	13.47	54.35	0.46	
73	Seychelles	13.37	53.73	0.45	
74	TFYR of Macedonia	13.35	53.60	0.44	
75	Panama	13.28	53.09	0.44	
76	Bolivia, Plurinational St. (2007)	13.15	52.24	0.43	
77	Dominican Republic	13.08	51.77	0.42	
78	China	13.07	51.70	0.41	
79	Peru (2010)	13.07	51.65	0.40	
80	Mexico	13.06	51.61	0.40	
81	Indonesia	12.99	51.12	0.39	
82	Malaysia (2005)	12.73	49.39	0.38	
83	Bhutan (2013)	12.62	48.64	0.37	
84	Kyrgyzstan (2011)	12.51	47.91	0.37	
85	Botswana (2008)	12.49	47.78	0.36	
86	Jamaica (2013)	12.36	46.85	0.35	
87	Nepal (2011)	12.35	46.83	0.34	
88	Armenia (2009)	12.32	46.59	0.34	
89	Trinidad and Tobago (2004)	12.27	46.26	0.33	
90	El Salvador	12.26	46.17	0.32	
91	Togo (2011)	12.23	46.03	0.31	
92	Azerbaijan	11.94	44.04	0.31	
93	Paraguay (2010)	11.91	43.85	0.30	
94	Moldova, Rep. (2013)	11.87	43.56	0.29	
95	India (2011)	11.70	42.40	0.28	
96	Morocco (2011)	11.56	41.49	0.27	
97	Uzbekistan (2011)	11.51	41.15	0.27	
98	Ghana	11.50	41.09	0.26	
99	Namibia (2006)	11.34	40.01	0.25	
100	Swaziland (2011)	11.33	39.93	0.24	
101	Angola (2011)	11.32	39.83	0.24	
102	Philippines (2009)	11.28	39.56	0.23	
103	Tajikistan	11.24	39.34	0.22	
104	Lesotho	11.14	38.64	0.21	
105	Honduras (2013)	11.10	38.37	0.21	
106	Kenya (2009)	10.98	37.58	0.20	
107	Cambodia (2008)	10.90	37.05	0.19	
108	Zimbabwe	10.85	36.68	0.18	
109	Malawi (2011)	10.75	36.02	0.18	
110	Guatemala (2007)	10.62	35.14	0.17	
111	Cameroon (2011)	10.40	33.62	0.16	
112	Madagascar	10.35	33.27	0.15	
113	Guyana	10.29	32.90	0.15	
114	Rwanda (2013)	10.27	32.78	0.14	
115	Burundi (2010)	10.11	31.64	0.13	
116	Bangladesh (2011)	9.98	30.76	0.12	
117	Uganda (2011)	9.77	29.37	0.11	
118	Mozambique (2013)	9.28	26.07	0.11	
119	Tanzania, United Rep.	9.17	25.33	0.10	
120	Yemen (2011)	9.15	25.22	0.09	
121	Nigeria (2005)	8.99	24.10	0.08	
122	Côte d'Ivoire (2013)	8.94	23.75	0.08	○
123	Gambia (2010)	8.77	22.62	0.07	○
124	Guinea	8.70	22.15	0.06	
125	Myanmar (2007)	8.63	21.65	0.05	
126	Mali (2011)	8.43	20.29	0.05	
127	Senegal (2010)	7.95	17.05	0.04	○
128	Pakistan (2013)	7.79	15.99	0.03	○
129	Burkina Faso (2013)	7.77	15.86	0.02	○
130	Sudan	7.00	10.63	0.02	○
131	Ethiopia (2005)	6.60	7.99	0.01	○
132	Niger	5.42	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Canada	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Singapore	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Viet Nam	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

2.1.4 Assessment in reading, mathematics, and science

PISA average scales in reading, mathematics, and science | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	China	587.46	100.00	1.00	●
2	Singapore	555.73	87.38	0.98	●
3	Hong Kong (China)	553.59	86.53	0.97	
4	Korea, Rep.	542.45	82.10	0.95	
5	Japan	540.40	81.28	0.93	
6	Finland	529.40	76.91	0.92	
7	Estonia	526.08	75.59	0.90	
8	Canada	522.21	74.05	0.89	
9	Poland	520.50	73.37	0.87	●
10	Netherlands	518.75	72.68	0.85	
11	Switzerland	518.42	72.55	0.84	
12	Ireland	515.56	71.41	0.82	
13	Germany	515.11	71.23	0.80	
14	Australia	512.48	70.18	0.79	
15	Belgium	509.77	69.10	0.77	
16	New Zealand	509.19	68.87	0.75	
17	United Kingdom	502.46	66.20	0.74	
18	Austria	500.31	65.34	0.72	
19	Czech Republic	500.05	65.24	0.70	
20	France	499.81	65.14	0.69	
21	Slovenia	498.86	64.77	0.67	
22	Denmark	498.21	64.51	0.66	
23	Norway	495.94	63.61	0.64	
24	Latvia	493.82	62.76	0.62	
25	United States of America	492.12	62.09	0.61	
26	Luxembourg	489.62	61.09	0.59	
27	Spain	489.57	61.07	0.57	
28	Italy	489.54	61.06	0.56	
29	Portugal	488.03	60.46	0.54	
30	Hungary	486.60	59.89	0.52	
31	Iceland	484.49	59.05	0.51	
32	Lithuania	483.94	58.83	0.49	
33	Croatia	482.35	58.20	0.48	
34	Sweden	482.13	58.11	0.46	○
35	Russian Federation	481.20	57.74	0.44	
36	Israel	474.12	54.93	0.43	○
37	Slovakia	471.87	54.03	0.41	
38	United Arab Emirates	468.74	52.79	0.39	
39	Greece	465.63	51.55	0.38	
40	Turkey	462.30	50.23	0.36	
41	Serbia	446.60	43.98	0.34	
42	Bulgaria	440.44	41.54	0.33	
43	Romania	440.31	41.48	0.31	
44	Thailand	437.32	40.29	0.30	
45	Chile	436.32	39.90	0.28	○
46	Costa Rica	425.63	35.64	0.26	○
47	Mexico	417.25	32.31	0.25	○
48	Kazakhstan	416.41	31.98	0.23	
49	Montenegro	413.95	31.00	0.21	○
50	Venezuela, Bolivarian Rep. (2010)	413.44	30.80	0.20	
51	Malaysia	412.74	30.52	0.18	○
52	Uruguay	412.16	30.29	0.16	○
53	Brazil	402.10	26.29	0.15	○
54	Jordan	398.00	24.66	0.13	○
55	Argentina	396.68	24.13	0.11	
56	Tunisia	396.65	24.12	0.10	○
57	Albania	395.22	23.55	0.08	○
58	Colombia	392.86	22.61	0.07	○
59	Indonesia	384.38	19.24	0.05	○
60	Qatar	382.53	18.50	0.03	○
61	Peru	375.12	15.56	0.02	○
62	India (2010)	336.00	0.00	0.00	○
n/a	Algeria	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Armenia	n/a	n/a	n/a	
n/a	Azerbaijan	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Belarus	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	

Rank	Country/Economy	Value	Score (0–100)	Percent rank
n/a	Bosnia and Herzegovina	n/a	n/a	n/a
n/a	Botswana	n/a	n/a	n/a
n/a	Burkina Faso	n/a	n/a	n/a
n/a	Burundi	n/a	n/a	n/a
n/a	Cabo Verde	n/a	n/a	n/a
n/a	Cambodia	n/a	n/a	n/a
n/a	Cameroon	n/a	n/a	n/a
n/a	Côte d'Ivoire	n/a	n/a	n/a
n/a	Cyprus	n/a	n/a	n/a
n/a	Dominican Republic	n/a	n/a	n/a
n/a	Ecuador	n/a	n/a	n/a
n/a	Egypt	n/a	n/a	n/a
n/a	El Salvador	n/a	n/a	n/a
n/a	Ethiopia	n/a	n/a	n/a
n/a	Fiji	n/a	n/a	n/a
n/a	Gambia	n/a	n/a	n/a
n/a	Georgia	n/a	n/a	n/a
n/a	Ghana	n/a	n/a	n/a
n/a	Guatemala	n/a	n/a	n/a
n/a	Guinea	n/a	n/a	n/a
n/a	Guyana	n/a	n/a	n/a
n/a	Honduras	n/a	n/a	n/a
n/a	Iran, Islamic Rep.	n/a	n/a	n/a
n/a	Jamaica	n/a	n/a	n/a
n/a	Kenya	n/a	n/a	n/a
n/a	Kuwait	n/a	n/a	n/a
n/a	Kyrgyzstan	n/a	n/a	n/a
n/a	Lebanon	n/a	n/a	n/a
n/a	Lesotho	n/a	n/a	n/a
n/a	Madagascar	n/a	n/a	n/a
n/a	Malawi	n/a	n/a	n/a
n/a	Mali	n/a	n/a	n/a
n/a	Malta	n/a	n/a	n/a
n/a	Mauritius	n/a	n/a	n/a
n/a	Moldova, Rep.	n/a	n/a	n/a
n/a	Mongolia	n/a	n/a	n/a
n/a	Morocco	n/a	n/a	n/a
n/a	Mozambique	n/a	n/a	n/a
n/a	Myanmar	n/a	n/a	n/a
n/a	Namibia	n/a	n/a	n/a
n/a	Nepal	n/a	n/a	n/a
n/a	Nicaragua	n/a	n/a	n/a
n/a	Niger	n/a	n/a	n/a
n/a	Nigeria	n/a	n/a	n/a
n/a	Oman	n/a	n/a	n/a
n/a	Pakistan	n/a	n/a	n/a
n/a	Panama	n/a	n/a	n/a
n/a	Paraguay	n/a	n/a	n/a
n/a	Philippines	n/a	n/a	n/a
n/a	Rwanda	n/a	n/a	n/a
n/a	Saudi Arabia	n/a	n/a	n/a
n/a	Senegal	n/a	n/a	n/a
n/a	Seychelles	n/a	n/a	n/a
n/a	South Africa	n/a	n/a	n/a
n/a	Sri Lanka	n/a	n/a	n/a
n/a	Sudan	n/a	n/a	n/a
n/a	Swaziland	n/a	n/a	n/a
n/a	Tajikistan	n/a	n/a	n/a
n/a	Tanzania, United Rep.	n/a	n/a	n/a
n/a	TFYR of Macedonia	n/a	n/a	n/a
n/a	Togo	n/a	n/a	n/a
n/a	Trinidad and Tobago	n/a	n/a	n/a
n/a	Uganda	n/a	n/a	n/a
n/a	Ukraine	n/a	n/a	n/a
n/a	Uzbekistan	n/a	n/a	n/a
n/a	Viet Nam	n/a	n/a	n/a
n/a	Yemen	n/a	n/a	n/a
n/a	Zambia	n/a	n/a	n/a
n/a	Zimbabwe	n/a	n/a	n/a

SOURCE: OECD Programme for International Student Assessment (PISA) (2010–12)
NOTE: ● indicates a strength; ○ a weakness

2.1.5 Pupil-teacher ratio, secondary

Pupil-teacher ratio, secondary | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Georgia (2009)	7.57	100.00	1.00	●
2	Belarus (2013)	7.76	99.44	0.99	●
3	Croatia	7.81	99.30	0.98	●
4	Luxembourg	7.88	99.08	0.97	●
5	Greece (2007)	7.88	99.07	0.97	●
6	Latvia	7.90	99.03	0.96	●
7	Portugal	8.16	98.25	0.95	●
8	Kuwait (2009)	8.17	98.22	0.94	●
9	Lebanon (2013)	8.21	98.12	0.93	●
10	Lithuania	8.32	97.81	0.92	●
11	Estonia	8.38	97.63	0.92	●
12	Malta	8.52	97.20	0.91	
13	Kazakhstan	8.60	96.97	0.90	●
14	Poland	8.66	96.79	0.89	●
15	Russian Federation	8.76	96.49	0.88	●
16	Paraguay (2011)	8.87	96.18	0.87	●
17	Slovenia (2011)	8.96	95.91	0.87	
18	Serbia (2013)	9.00	95.79	0.86	●
19	Finland	9.27	95.02	0.85	
20	Ukraine (2013)	9.32	94.87	0.84	●
21	Switzerland	9.33	94.84	0.83	
22	Sweden	9.52	94.27	0.82	
23	Austria	9.54	94.22	0.82	
24	Moldova, Rep. (2013)	9.59	94.08	0.81	●
25	Cyprus	9.67	93.85	0.80	
26	Qatar (2013)	9.67	93.83	0.79	
27	Israel (2009)	9.76	93.56	0.78	
28	Bahrain	9.82	93.40	0.77	
29	Hungary	10.04	92.75	0.76	
30	Italy (2007)	10.10	92.57	0.76	
31	TFYR of Macedonia	10.49	91.43	0.75	
32	Argentina (2008)	10.90	90.23	0.74	
33	Bosnia and Herzegovina (2013)	11.13	89.56	0.73	●
34	Czech Republic	11.19	89.38	0.72	
35	Uruguay (2010)	11.32	89.00	0.71	
36	Saudi Arabia (2009)	11.32	89.00	0.71	
37	Slovakia	11.35	88.93	0.70	
38	Spain	11.35	88.91	0.69	
39	United Arab Emirates (2013)	11.50	88.46	0.68	
40	Japan	11.68	87.96	0.67	
41	Egypt (2009)	12.13	86.61	0.66	●
42	Seychelles	12.19	86.44	0.66	
43	Bulgaria	12.32	86.06	0.65	
44	Germany	12.74	84.82	0.64	
45	Romania	12.75	84.80	0.63	
46	France	12.83	84.56	0.62	
47	Uzbekistan (2011)	13.28	83.26	0.61	●
48	Tunisia (2011)	13.62	82.24	0.61	
49	Guatemala	13.66	82.14	0.60	
50	Costa Rica (2013)	13.79	81.77	0.59	
51	Netherlands	13.86	81.56	0.58	○
52	Botswana (2007)	13.88	81.50	0.57	
53	Malaysia	13.92	81.37	0.56	
54	Ecuador (2013)	14.06	80.98	0.55	
55	Panama	14.18	80.60	0.55	
56	United Kingdom (2008)	14.27	80.35	0.54	○
57	New Zealand	14.36	80.09	0.53	○
58	Mongolia (2010)	14.49	79.70	0.52	
59	China	14.50	79.67	0.51	
60	Barbados (2006)	14.58	79.43	0.50	
61	United States of America	14.66	79.20	0.50	
62	Mauritius	14.71	79.07	0.49	
63	Albania (2013)	14.76	78.92	0.48	
64	Singapore (2009)	14.91	78.48	0.47	○
65	Kyrgyzstan (2010)	15.21	77.60	0.46	
66	Tajikistan (2011)	15.44	76.93	0.45	
67	Peru (2013)	15.46	76.85	0.45	
68	Korea, Rep.	15.94	75.47	0.44	
69	Brazil	15.97	75.36	0.43	
70	Yemen (2011)	16.09	75.03	0.42	●
71	Jamaica (2013)	16.18	74.76	0.41	
72	Swaziland	16.35	74.27	0.40	
73	Indonesia	16.62	73.47	0.39	
74	Cabo Verde (2013)	16.66	73.34	0.39	
75	Sri Lanka	17.28	71.52	0.38	
76	Ghana (2013)	17.53	70.80	0.37	
77	Mexico	17.74	70.18	0.36	
78	Turkey	17.95	69.58	0.35	
79	Bolivia, Plurinational St. (2007)	18.17	68.93	0.34	
80	Morocco (2004)	18.73	67.29	0.34	
81	Mali (2013)	19.28	65.68	0.33	
82	Fiji	19.29	65.63	0.32	
83	Bhutan	19.89	63.88	0.31	
84	Thailand (2011)	19.91	63.83	0.30	
85	Chile	20.04	63.43	0.29	○
86	Guyana	20.29	62.70	0.29	
87	Pakistan	21.04	60.50	0.28	
88	Uganda (2013)	21.32	59.69	0.27	
89	Cameroon	21.43	59.35	0.26	
90	Zimbabwe	22.43	56.43	0.25	
91	Côte d'Ivoire (2013)	22.68	55.69	0.24	
92	Rwanda (2013)	22.79	55.37	0.24	
93	Namibia (2007)	24.62	50.00	0.23	
94	Lesotho	24.69	49.80	0.22	
95	South Africa (2009)	25.05	48.76	0.21	○
96	Colombia (2013)	25.19	48.34	0.20	○
97	India (2011)	25.92	46.20	0.19	
98	Togo (2011)	26.25	45.25	0.18	
99	Tanzania, United Rep.	26.39	44.81	0.18	
100	Burkina Faso (2013)	26.91	43.30	0.17	
101	Senegal (2011)	27.35	42.01	0.16	
102	Angola (2011)	27.42	41.81	0.15	
103	Madagascar	27.64	41.17	0.14	
104	Cambodia (2007)	28.92	37.40	0.13	
105	Dominican Republic	29.18	36.66	0.13	
106	Nepal (2013)	29.18	36.66	0.12	
107	Nicaragua (2010)	30.83	31.81	0.11	
108	Sudan	31.09	31.06	0.10	
109	Mozambique (2013)	31.18	30.79	0.09	
110	Burundi (2013)	31.66	29.38	0.08	
111	Bangladesh	32.24	27.68	0.08	
112	Nigeria (2010)	33.08	25.21	0.07	
113	Guinea (2011)	33.14	25.05	0.06	
114	Myanmar (2010)	34.08	22.29	0.05	
115	Niger (2011)	34.68	20.52	0.04	
116	Philippines (2009)	34.81	20.13	0.03	○
117	El Salvador (2013)	37.99	10.81	0.03	○
118	Ethiopia	38.78	8.52	0.02	○
119	Kenya	41.13	1.60	0.01	○
120	Malawi (2013)	41.68	0.00	0.00	○
n/a	Algeria	n/a	n/a	n/a	
n/a	Armenia	n/a	n/a	n/a	
n/a	Australia	n/a	n/a	n/a	
n/a	Azerbaijan	n/a	n/a	n/a	
n/a	Belgium	n/a	n/a	n/a	
n/a	Canada	n/a	n/a	n/a	
n/a	Denmark	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Hong Kong (China)	n/a	n/a	n/a	
n/a	Iceland	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Ireland	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Norway	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Viet Nam	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

2.2.1 Tertiary enrolment

School enrolment, tertiary (% gross) | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Greece	116.62	100.00	1.00	●
2	Korea, Rep.	98.38	84.25	0.99	●
3	United States of America	94.28	80.71	0.98	●
4	Finland	93.72	80.23	0.98	
5	Belarus (2013)	92.89	79.51	0.97	●
6	Australia	86.33	73.85	0.96	●
7	Slovenia	86.02	73.58	0.95	●
8	Spain	84.57	72.32	0.95	●
9	Iceland	81.36	69.55	0.94	
10	Argentina	80.31	68.64	0.93	●
11	New Zealand	79.78	68.18	0.92	
12	Denmark	79.60	68.03	0.92	
13	Ukraine (2013)	79.00	67.51	0.91	●
14	Venezuela, Bolivarian Rep. (2009)	77.91	66.57	0.90	●
15	Netherlands	77.34	66.08	0.89	
16	Estonia	76.68	65.51	0.89	
17	Russian Federation	76.14	65.05	0.88	●
18	Chile	74.39	63.53	0.87	●
19	Norway	74.10	63.28	0.86	
20	Lithuania	73.95	63.15	0.86	●
21	Poland	73.19	62.50	0.85	●
22	Austria	72.44	61.85	0.84	
23	Ireland	71.24	60.81	0.83	
24	Belgium	70.83	60.46	0.83	
25	Sweden	70.03	59.76	0.82	
26	Turkey	69.39	59.21	0.81	●
27	Portugal	68.86	58.76	0.80	
28	Israel	67.89	57.92	0.80	
29	Hong Kong (China) (2013)	66.84	57.01	0.79	
30	Latvia	65.13	55.54	0.78	
31	Czech Republic	64.17	54.71	0.77	
32	Uruguay (2010)	63.15	53.83	0.77	●
33	Bulgaria	62.70	53.44	0.76	
34	Italy	62.47	53.24	0.75	
35	Mongolia (2013)	62.27	53.07	0.74	
36	United Kingdom	61.88	52.73	0.74	
37	Germany	61.65	52.53	0.73	
38	Croatia	61.63	52.52	0.72	
39	Japan	61.46	52.37	0.71	
40	Barbados (2011)	60.84	51.83	0.71	
41	Hungary	59.63	50.79	0.70	
42	France	58.30	49.64	0.69	
43	Saudi Arabia (2013)	57.52	48.96	0.68	
44	Serbia (2013)	56.38	47.98	0.68	
45	Switzerland	55.56	47.27	0.67	
46	Montenegro (2010)	55.53	47.25	0.66	
47	Albania	55.50	47.22	0.65	
48	Iran, Islamic Rep.	55.16	46.93	0.65	●
49	Slovakia	55.11	46.88	0.64	
50	Romania (2011)	51.60	43.85	0.63	
51	Thailand (2013)	51.23	43.54	0.62	
52	Colombia (2013)	48.33	41.03	0.62	
53	Lebanon (2013)	47.93	40.68	0.61	
54	Kyrgyzstan (2013)	47.64	40.43	0.60	
55	Costa Rica (2013)	47.60	40.40	0.59	
56	Jordan	46.61	39.54	0.59	
57	Dominican Republic	46.38	39.34	0.58	●
58	Armenia (2013)	46.11	39.11	0.57	
59	Cyprus	45.86	38.90	0.56	
60	Kazakhstan	44.53	37.75	0.56	
61	Panama	43.46	36.82	0.55	
62	Moldova, Rep. (2013)	41.28	34.94	0.54	
63	Malta	41.21	34.88	0.53	
64	Mauritius (2013)	41.21	34.88	0.53	
65	Peru (2010)	40.65	34.40	0.52	
66	Ecuador	40.51	34.28	0.51	
67	TFYR of Macedonia	38.46	32.51	0.50	
68	Bolivia, Plurinational St. (2007)	37.69	31.84	0.50	
69	Malaysia	37.20	31.42	0.49	
70	Tunisia	35.20	29.69	0.48	
71	Paraguay (2010)	34.51	29.10	0.47	
72	Bahrain	33.46	28.19	0.47	
73	Georgia (2013)	33.05	27.84	0.46	
74	Indonesia	31.51	26.51	0.45	
75	Algeria	31.46	26.47	0.44	●
76	Egypt	30.06	25.25	0.44	
77	Mexico	28.99	24.33	0.43	
78	Jamaica (2013)	28.74	24.11	0.42	
79	Kuwait (2013)	28.45	23.86	0.41	
80	Philippines (2009)	28.20	23.65	0.41	
81	Oman (2011)	28.14	23.59	0.40	
82	China	26.70	22.35	0.39	
83	Brazil (2005)	25.53	21.34	0.38	
84	El Salvador	25.45	21.28	0.38	
85	India	24.80	20.72	0.37	
86	Viet Nam (2013)	24.58	20.52	0.36	
87	Cabo Verde (2013)	22.85	19.02	0.35	
88	Tajikistan	22.47	18.70	0.35	
89	Honduras (2013)	21.14	17.55	0.34	
90	Azerbaijan	20.44	16.94	0.33	
91	Luxembourg	19.74	16.35	0.32	
92	South Africa	19.70	16.31	0.32	
93	Guatemala (2013)	18.74	15.48	0.31	
94	Botswana (2011)	17.91	14.76	0.30	
95	Sudan (2013)	17.15	14.11	0.29	●
96	Sri Lanka	16.97	13.95	0.29	
97	Morocco (2011)	16.16	13.25	0.28	
98	Fiji (2005)	16.15	13.24	0.27	
99	Cambodia (2011)	15.83	12.97	0.26	
100	Nepal (2011)	14.49	11.81	0.26	
101	Qatar (2013)	14.26	11.61	0.25	
102	Myanmar	13.38	10.85	0.24	●
103	Bangladesh	13.23	10.72	0.23	
104	Guyana	12.91	10.45	0.23	
105	Ghana	12.20	9.83	0.22	
106	Trinidad and Tobago (2004)	11.95	9.62	0.21	
107	Cameroon (2011)	11.91	9.58	0.20	
108	Lesotho	10.83	8.64	0.20	
109	Nigeria (2005)	10.41	8.28	0.19	
110	Yemen (2011)	10.29	8.18	0.18	
111	Togo (2013)	10.04	7.97	0.17	
112	Guinea	9.93	7.87	0.17	
113	Pakistan (2013)	9.82	7.78	0.16	
114	Bhutan	9.43	7.44	0.15	
115	Namibia (2008)	9.33	7.35	0.14	
116	Côte d'Ivoire (2013)	9.10	7.16	0.14	
117	Uzbekistan (2011)	8.87	6.96	0.13	
118	Senegal (2010)	7.63	5.89	0.12	
119	Angola (2011)	7.50	5.77	0.11	
120	Mali	7.47	5.75	0.11	
121	Rwanda	6.90	5.26	0.10	○
122	Zimbabwe (2013)	5.83	4.33	0.09	
123	Swaziland (2013)	5.33	3.90	0.08	○
124	Mozambique (2013)	5.19	3.78	0.08	○
125	Burkina Faso (2013)	4.78	3.42	0.07	○
126	Uganda (2011)	4.38	3.08	0.06	○
127	Madagascar	4.09	2.83	0.05	
128	Kenya (2009)	4.05	2.79	0.05	○
129	Tanzania, United Rep.	3.92	2.68	0.04	○
130	Burundi (2010)	3.17	2.03	0.03	
131	Ethiopia (2005)	2.79	1.70	0.02	○
132	Niger	1.75	0.81	0.02	○
133	Seychelles	1.33	0.45	0.01	○
134	Malawi (2011)	0.81	0.00	0.00	○
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Canada	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Singapore	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

2.2.2 Graduates in science and engineering

Tertiary graduates in science, engineering, manufacturing, and construction (% of total tertiary graduates) | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Iran, Islamic Rep.	47.22	100.00	1.00	●
2	Myanmar	47.14	99.82	0.99	●
3	Tunisia	42.38	89.14	0.98	●
4	Oman (2010)	38.94	81.42	0.97	●
5	Morocco (2010)	34.91	72.37	0.96	●
6	Hong Kong (China) (2006)	34.67	71.84	0.95	
7	Qatar	33.57	69.38	0.94	●
8	Korea, Rep.	31.06	63.75	0.93	
9	Malaysia	30.90	63.40	0.92	●
10	Trinidad and Tobago (2004)	30.38	62.23	0.91	●
11	Saudi Arabia	28.95	59.02	0.90	●
12	Greece	28.66	58.37	0.89	●
13	Russian Federation (2009)	28.11	57.13	0.88	●
14	Finland	27.56	55.89	0.87	
15	Germany	27.21	55.11	0.86	
16	Sweden	27.19	55.06	0.85	
17	Belarus	27.17	55.03	0.84	●
18	Mexico	26.88	54.38	0.83	●
19	United Arab Emirates	26.02	52.43	0.82	
20	Ukraine	25.57	51.42	0.81	
21	Tajikistan	25.50	51.28	0.80	●
22	Austria	25.45	51.16	0.79	
23	France	25.36	50.95	0.78	
24	Portugal	25.01	50.18	0.77	
25	Seychelles (2011)	25.00	50.15	0.76	●
26	Algeria (2011)	24.95	50.04	0.75	●
27	Serbia	24.80	49.69	0.74	
28	Slovenia	24.74	49.56	0.73	
29	Viet Nam	24.05	48.02	0.72	
30	Croatia	23.85	47.57	0.71	
31	Ireland	23.76	47.38	0.70	
32	Lebanon (2011)	23.35	46.45	0.69	
33	Zimbabwe	23.28	46.29	0.68	●
34	Rwanda	22.45	44.43	0.67	●
35	Spain	22.21	43.90	0.66	
36	Lithuania	22.12	43.69	0.65	
37	Estonia	22.12	43.69	0.64	
38	Panama (2011)	22.03	43.50	0.63	
39	United Kingdom	21.85	43.09	0.62	○
40	Indonesia (2009)	21.68	42.71	0.61	
41	Czech Republic	21.61	42.55	0.60	
42	El Salvador	21.54	42.38	0.59	
43	Bulgaria	21.48	42.25	0.58	
44	Cyprus	21.46	42.22	0.57	
45	Colombia	21.45	42.19	0.56	
46	Denmark	21.24	41.72	0.55	○
47	Uzbekistan (2011)	21.14	41.48	0.54	●
48	Cameroon (2010)	21.02	41.22	0.53	●
49	Turkey	20.89	40.92	0.52	
50	Switzerland (2011)	20.85	40.84	0.51	○
51	Georgia	20.74	40.60	0.50	
52	Slovakia	20.61	40.30	0.49	
53	Madagascar	20.47	39.99	0.48	
54	Japan	20.26	39.51	0.47	
55	Romania (2011)	20.18	39.34	0.46	
56	Italy	20.18	39.33	0.45	
57	Burkina Faso	19.94	38.81	0.44	
58	Chile	19.18	37.09	0.43	
59	Malta	19.12	36.95	0.42	
60	TFYR of Macedonia	19.07	36.86	0.41	
61	New Zealand	18.79	36.22	0.40	○
62	Latvia	18.76	36.15	0.39	○
63	Iceland	17.96	34.35	0.38	○
64	Bahrain (2006)	17.91	34.25	0.37	
65	Mongolia (2011)	17.59	33.52	0.36	
66	Norway	16.96	32.13	0.35	○
67	Hungary	16.84	31.84	0.34	
68	Poland	16.81	31.78	0.33	
69	Guatemala (2007)	16.76	31.67	0.32	
70	Swaziland (2013)	16.75	31.65	0.31	
71	Sri Lanka	16.70	31.54	0.30	
72	Belgium	16.44	30.96	0.29	○
73	Azerbaijan	16.21	30.43	0.28	
74	Jordan (2011)	16.12	30.24	0.27	
75	United States of America	16.05	30.06	0.26	○
76	Sudan	16.02	30.01	0.25	●
77	Australia (2011)	15.93	29.80	0.24	○
78	Armenia (2010)	15.92	29.77	0.23	
79	Kyrgyzstan	15.64	29.15	0.22	
80	Bangladesh	15.62	29.11	0.21	
81	Uruguay (2010)	15.60	29.07	0.20	○
82	Ethiopia (2010)	15.23	28.24	0.19	
83	Barbados (2011)	14.99	27.69	0.18	○
84	Luxembourg	14.74	27.14	0.17	○
85	Netherlands	14.42	26.41	0.16	○
86	Ghana	14.18	25.87	0.15	
87	Honduras	14.13	25.77	0.14	○
88	Albania (2011)	13.79	25.00	0.13	
89	Argentina (2011)	13.48	24.31	0.12	
90	Guyana	13.44	24.22	0.11	○
91	Ecuador (2008)	12.81	22.80	0.10	○
92	Lesotho	12.55	22.23	0.09	
93	Cambodia (2008)	12.49	22.09	0.08	○
94	Brazil	11.96	20.90	0.07	○
95	Costa Rica (2011)	11.90	20.76	0.06	○
96	Nepal (2011)	11.78	20.49	0.05	○
97	Burundi (2010)	9.58	15.57	0.04	
98	Uganda (2004)	9.53	15.45	0.03	○
99	Mozambique (2011)	8.90	14.03	0.02	○
100	Niger (2008)	4.28	3.66	0.01	○
101	Namibia (2008)	2.64	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Canada	n/a	n/a	n/a	
n/a	China	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Egypt	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	India	n/a	n/a	n/a	
n/a	Israel	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Kazakhstan	n/a	n/a	n/a	
n/a	Kenya	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Mauritius	n/a	n/a	n/a	
n/a	Moldova, Rep.	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Pakistan	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Peru	n/a	n/a	n/a	
n/a	Philippines	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Singapore	n/a	n/a	n/a	
n/a	South Africa	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	Thailand	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

2.2.3 Tertiary inbound mobility

Tertiary inbound mobility ratio (%) | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Cyprus	23.46	100.00	0.97	●
1	Fiji (2004)	32.94	100.00	0.97	●
1	Luxembourg	40.56	100.00	0.97	●
1	Qatar (2013)	40.71	100.00	0.97	●
1	United Arab Emirates (2013)	44.63	100.00	0.97	●
6	Singapore (2013)	19.17	81.68	0.96	
7	Australia	18.30	77.97	0.95	
8	United Kingdom	17.14	73.02	0.94	
9	Switzerland	16.50	70.29	0.93	
10	New Zealand	15.79	67.29	0.92	
11	Austria	15.42	65.70	0.91	●
12	Barbados (2011)	13.80	58.79	0.90	●
13	Lebanon	12.82	54.60	0.90	●
14	France	11.82	50.34	0.89	
15	Uganda (2011)	10.73	45.71	0.88	●
16	Namibia (2008)	10.17	43.31	0.87	●
17	Jordan	9.11	38.79	0.86	●
18	Belgium	8.98	38.25	0.85	
19	Czech Republic	8.96	38.16	0.84	
20	Hong Kong (China) (2013)	8.90	37.89	0.83	
21	Bahrain	8.48	36.11	0.83	
22	Denmark	8.13	34.61	0.82	
23	Norway	7.75	32.97	0.81	
24	Netherlands	7.25	30.84	0.80	
25	Germany	7.04	29.97	0.79	
26	Bosnia and Herzegovina (2013)	6.48	27.58	0.78	●
27	Sweden	6.32	26.87	0.77	
28	Iceland	6.21	26.42	0.77	
29	Burundi (2010)	6.19	26.35	0.76	●
30	Trinidad and Tobago (2004)	5.78	24.61	0.75	●
31	Ireland	5.76	24.51	0.74	
32	Finland	5.71	24.28	0.73	
33	Niger	5.43	23.08	0.72	●
34	Malaysia	5.22	22.20	0.71	
35	Malta	4.84	20.59	0.70	
36	Portugal	4.75	20.18	0.70	
37	Hungary	4.60	19.56	0.69	
38	Saudi Arabia (2013)	4.58	19.46	0.68	
39	Côte d'Ivoire (2013)	4.40	18.69	0.67	●
40	Greece	4.37	18.58	0.66	
41	Yemen (2011)	4.26	18.10	0.65	●
42	South Africa	4.19	17.82	0.64	
43	Slovakia	4.09	17.40	0.63	
44	Italy	4.04	17.15	0.63	
45	Kyrgyzstan (2013)	3.96	16.81	0.62	
46	Bulgaria	3.93	16.72	0.61	
47	Japan	3.88	16.47	0.60	
48	Serbia (2013)	3.74	15.87	0.59	
49	United States of America	3.53	14.98	0.58	
50	Dominican Republic	3.48	14.79	0.57	●
51	Ghana	3.09	13.12	0.57	
52	Georgia (2013)	3.03	12.87	0.56	
53	Armenia (2013)	3.02	12.80	0.55	
54	Burkina Faso (2013)	2.90	12.30	0.54	●
55	Mauritius (2013)	2.87	12.17	0.53	
56	Spain	2.84	12.03	0.52	○
57	Latvia	2.80	11.87	0.51	
58	Oman (2013)	2.63	11.17	0.50	
59	Azerbaijan	2.50	10.61	0.50	
60	Belarus (2013)	2.41	10.21	0.49	
61	Estonia	2.33	9.86	0.48	○
62	Slovenia	2.27	9.60	0.47	
63	Ukraine (2013)	2.25	9.54	0.46	
64	Russian Federation	2.17	9.21	0.45	
65	TFYR of Macedonia	2.17	9.17	0.44	
66	Morocco (2010)	1.93	8.16	0.43	
67	Moldova, Rep. (2013)	1.88	7.96	0.43	
68	Egypt (2010)	1.85	7.83	0.42	
69	Romania (2011)	1.84	7.80	0.41	
70	Lithuania	1.79	7.58	0.40	
71	Korea, Rep.	1.77	7.49	0.39	○
72	Madagascar	1.74	7.34	0.38	
73	Tajikistan	1.60	6.76	0.37	
74	Costa Rica (2004)	1.43	6.05	0.37	
75	Togo (2007)	1.41	5.96	0.36	
76	Cameroon (2011)	1.39	5.84	0.35	
77	Kazakhstan	1.38	5.81	0.34	
78	Albania	1.30	5.48	0.33	
79	Israel	1.19	5.00	0.32	○
80	Poland	1.17	4.93	0.31	○
81	Malawi (2010)	1.14	4.78	0.30	
82	Cabo Verde (2013)	0.96	4.05	0.30	
83	Guinea	0.92	3.85	0.29	●
84	Honduras (2013)	0.89	3.73	0.28	
85	Turkey	0.89	3.71	0.27	
86	Thailand	0.84	3.50	0.26	
87	Rwanda	0.76	3.19	0.25	
88	Tanzania, United Rep. (2004)	0.64	2.66	0.24	
89	Mongolia (2013)	0.62	2.58	0.23	
90	Ecuador	0.59	2.45	0.23	
91	Algeria (2011)	0.55	2.28	0.22	
92	Croatia	0.54	2.22	0.21	○
93	Tunisia	0.53	2.20	0.20	○
94	Mali (2011)	0.53	2.18	0.19	
95	Swaziland (2013)	0.51	2.10	0.18	
96	Lesotho	0.50	2.06	0.17	
97	El Salvador	0.41	1.66	0.17	
98	Guyana	0.38	1.57	0.16	
99	Zimbabwe	0.37	1.53	0.15	
100	Botswana (2011)	0.35	1.44	0.14	
101	Chile	0.31	1.25	0.13	○
102	Mozambique (2013)	0.30	1.23	0.12	
103	China	0.27	1.10	0.11	○
104	Brazil	0.21	0.83	0.10	○
105	Viet Nam (2013)	0.16	0.62	0.10	○
106	Sri Lanka	0.14	0.52	0.09	○
107	Uzbekistan (2011)	0.14	0.51	0.08	○
108	Indonesia	0.12	0.43	0.07	○
109	Iran, Islamic Rep.	0.10	0.37	0.06	○
110	Philippines (2008)	0.10	0.36	0.05	○
111	Bangladesh (2009)	0.10	0.36	0.04	○
112	India	0.10	0.36	0.03	○
113	Venezuela, Bolivarian Rep. (2008)	0.09	0.32	0.03	
114	Cambodia (2006)	0.07	0.24	0.02	○
115	Nepal (2011)	0.03	0.05	0.01	○
116	Myanmar	0.02	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Argentina	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Canada	n/a	n/a	n/a	
n/a	Colombia	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Kenya	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Mexico	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Pakistan	n/a	n/a	n/a	
n/a	Panama	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Peru	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Uruguay	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

2.3.1 Researchers

Researchers, FTE (per million population) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Israel (2012)	8,337.13	100.00	1.00	●
2	Denmark	7,271.28	87.21	0.99	●
3	Finland	7,223.34	86.63	0.98	●
4	Iceland (2011)	7,012.22	84.10	0.97	●
5	Korea, Rep.	6,533.18	78.35	0.96	
6	Sweden	6,508.55	78.05	0.95	
7	Singapore (2012)	6,437.73	77.20	0.94	
8	Norway (2012)	5,575.03	66.85	0.93	
9	Japan	5,194.83	62.28	0.92	
10	Luxembourg	4,930.80	59.11	0.91	
11	Austria	4,699.46	56.34	0.90	●
12	Switzerland (2012)	4,495.21	53.89	0.89	
13	Canada (2012)	4,493.66	53.87	0.88	
14	Germany	4,362.56	52.29	0.88	
15	Netherlands	4,315.51	51.73	0.87	
16	Australia (2008)	4,280.36	51.31	0.86	
17	Slovenia	4,202.23	50.37	0.85	
18	France	4,124.62	49.44	0.84	
19	United Kingdom	4,107.73	49.23	0.83	
20	Portugal	4,083.76	48.95	0.82	
21	Belgium	4,020.82	48.19	0.81	
22	United States of America (2011)	3,978.73	47.69	0.80	
23	New Zealand (2011)	3,692.86	44.25	0.79	
24	Ireland (2012)	3,438.02	41.20	0.78	
25	Estonia	3,423.57	41.02	0.77	
26	Czech Republic	3,202.25	38.37	0.76	
27	Russian Federation	3,084.57	36.95	0.75	
28	Hong Kong (China) (2012)	2,970.70	35.59	0.74	
29	Lithuania	2,836.32	33.97	0.73	
30	Slovakia	2,702.16	32.36	0.72	
31	Spain	2,633.51	31.54	0.71	
32	Hungary	2,515.13	30.12	0.70	
33	Greece	2,486.30	29.77	0.69	
34	Malta	2,039.61	24.41	0.68	
35	Italy	1,934.30	23.15	0.67	
36	Poland	1,870.19	22.38	0.66	
37	Malaysia (2012)	1,777.17	21.26	0.65	
38	Latvia	1,768.02	21.15	0.64	
39	Bulgaria	1,699.31	20.33	0.63	
40	Croatia	1,522.01	18.20	0.63	
41	Tunisia (2012)	1,393.94	16.66	0.62	
42	Costa Rica (2011)	1,289.03	15.40	0.61	
43	Argentina (2012)	1,255.82	15.00	0.60	
44	Serbia (2012)	1,235.48	14.76	0.59	
45	Turkey	1,188.73	14.20	0.58	
46	Ukraine	1,163.29	13.89	0.57	
47	China	1,071.07	12.79	0.56	
48	Morocco (2011)	864.46	10.31	0.55	
49	Romania	861.99	10.28	0.54	
50	Cyprus	775.52	9.24	0.53	
51	Kazakhstan	763.48	9.09	0.52	
52	Montenegro (2011)	762.92	9.09	0.51	
53	Moldova, Rep.	752.18	8.96	0.50	
54	Iran, Islamic Rep. (2010)	736.12	8.77	0.49	
55	Brazil (2010)	710.28	8.46	0.48	
56	Qatar (2012)	586.90	6.97	0.47	
57	Thailand (2011)	546.14	6.48	0.46	
58	Uzbekistan (2011)	533.86	6.34	0.45	
59	Uruguay	529.19	6.28	0.44	
60	Egypt	465.97	5.52	0.43	
61	South Africa (2012)	408.17	4.83	0.42	
62	Chile (2012)	389.24	4.60	0.41	
63	Mexico (2011)	386.43	4.57	0.40	
64	Senegal (2010)	361.30	4.27	0.39	
65	TFYR of Macedonia (2011)	331.05	3.90	0.38	
66	Venezuela, Bolivarian Rep. (2012)	289.97	3.41	0.38	
67	Kenya (2010)	227.45	2.66	0.37	
68	Mauritius (2012)	183.86	2.14	0.36	
69	Ecuador (2011)	179.48	2.08	0.35	
70	Pakistan	166.05	1.92	0.34	
71	Algeria (2005)	164.69	1.91	0.33	
72	Bolivia, Plurinational St. (2010)	162.06	1.87	0.32	
73	Paraguay (2012)	161.65	1.87	0.31	
74	Colombia (2012)	161.45	1.87	0.30	
75	India (2010)	159.93	1.85	0.29	
76	Oman (2011)	159.89	1.85	0.28	
77	Bosnia and Herzegovina (2012)	150.58	1.74	0.27	
78	Seychelles (2005)	149.26	1.72	0.26	
79	Albania (2008)	147.94	1.71	0.25	
80	Kuwait (2012)	135.06	1.55	0.24	
81	Panama (2011)	117.10	1.34	0.23	
82	Sri Lanka (2010)	103.09	1.17	0.22	
83	Zimbabwe (2012)	95.10	1.07	0.21	
84	Indonesia (2009)	89.90	1.01	0.20	
85	Philippines (2007)	78.28	0.87	0.19	
86	Côte d'Ivoire (2005)	72.96	0.81	0.18	
87	Angola (2011)	56.99	0.61	0.17	
88	Madagascar (2011)	51.02	0.54	0.16	
89	Cabo Verde (2011)	50.96	0.54	0.15	
90	Malawi (2010)	48.76	0.51	0.14	
91	Burkina Faso (2010)	47.78	0.50	0.13	
92	Ethiopia	46.06	0.48	0.13	
93	Zambia (2008)	43.03	0.45	0.12	
94	Ghana (2010)	38.77	0.39	0.11	
95	Nigeria (2007)	38.57	0.39	0.10	
96	Mozambique (2010)	38.07	0.39	0.09	
97	Uganda (2010)	37.15	0.38	0.08	
98	Togo (2012)	36.48	0.37	0.07	
99	Tanzania, United Rep. (2010)	35.57	0.36	0.06	○
100	Gambia (2011)	33.78	0.34	0.05	○
101	Mali (2010)	31.64	0.31	0.04	
102	Guatemala (2012)	27.25	0.26	0.03	○
103	Rwanda (2009)	11.70	0.07	0.02	○
104	Niger (2005)	7.66	0.02	0.01	○
105	Lesotho (2011)	5.86	0.00	0.00	○
n/a	Armenia	n/a	n/a	n/a	
n/a	Azerbaijan	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Belarus	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Georgia	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Kyrgyzstan	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Mongolia	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Peru	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Viet Nam	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

2.3.2 Gross expenditure on R&D (GERD)

GERD: Gross expenditure on R&D (% of GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Israel	4.20	100.00	1.00	●
2	Korea, Rep.	4.15	98.81	0.99	●
3	Japan	3.49	82.94	0.98	●
4	Finland	3.46	82.18	0.97	
5	Sweden	3.42	81.41	0.97	●
6	Switzerland (2012)	3.13	74.36	0.96	
7	Denmark	3.10	73.82	0.95	
8	Germany	3.01	71.62	0.94	
9	Austria	2.90	68.89	0.93	●
10	United States of America (2012)	2.79	66.35	0.92	
11	Slovenia	2.65	62.97	0.91	●
12	Iceland (2011)	2.61	61.89	0.91	
13	Belgium	2.36	55.93	0.90	
14	France	2.29	54.35	0.89	
15	Australia (2011)	2.25	53.43	0.88	
16	Netherlands	2.11	50.17	0.87	
17	China	2.08	49.41	0.86	
18	Singapore (2012)	2.02	47.93	0.85	
19	Czech Republic	2.00	47.55	0.85	
20	Estonia	1.77	41.90	0.84	
21	United Kingdom	1.73	40.90	0.83	
22	Norway	1.69	40.10	0.82	
23	Ireland (2012)	1.66	39.35	0.81	
24	Canada	1.63	38.71	0.80	
25	Hungary	1.44	34.18	0.79	
26	Portugal	1.40	33.14	0.79	
27	Italy	1.30	30.61	0.78	
28	Spain	1.28	30.15	0.77	
29	New Zealand (2011)	1.27	29.91	0.76	
30	Brazil (2012)	1.24	29.18	0.75	●
31	Luxembourg	1.15	27.15	0.74	
32	Malaysia (2012)	1.13	26.61	0.74	
33	Russian Federation	1.12	26.50	0.73	
34	Serbia (2012)	0.97	22.86	0.72	
35	Kenya (2010)	0.97	22.82	0.71	
36	Lithuania	0.96	22.61	0.70	
37	Turkey	0.95	22.33	0.69	
38	Malta	0.88	20.77	0.68	
39	Poland	0.88	20.74	0.68	
40	Slovakia	0.85	19.91	0.67	
41	Croatia	0.82	19.24	0.66	
42	India (2011)	0.81	18.93	0.65	
43	Greece	0.78	18.40	0.64	
44	Ukraine	0.77	18.00	0.63	
45	South Africa (2012)	0.76	17.84	0.62	
46	Iran, Islamic Rep. (2008)	0.75	17.57	0.62	
47	Morocco (2010)	0.73	17.21	0.61	
48	Hong Kong (China) (2012)	0.73	17.05	0.60	
49	Belarus	0.69	16.08	0.59	
50	Tunisia (2012)	0.68	15.91	0.58	
51	Egypt	0.68	15.88	0.57	
52	Bulgaria	0.67	15.62	0.56	
53	Mali (2010)	0.66	15.48	0.56	
54	Ethiopia	0.61	14.37	0.55	●
55	Latvia	0.60	13.95	0.54	
56	Argentina (2012)	0.58	13.63	0.53	
57	Uganda (2010)	0.56	13.01	0.52	
58	Senegal (2010)	0.54	12.60	0.51	
59	Botswana (2005)	0.53	12.41	0.50	
60	Cyprus	0.52	12.14	0.50	
61	Tanzania, United Rep. (2010)	0.52	12.01	0.49	
62	Mexico	0.50	11.59	0.48	
63	United Arab Emirates (2011)	0.49	11.37	0.47	
64	Costa Rica (2011)	0.47	11.01	0.46	
65	Qatar (2012)	0.47	10.93	0.45	
66	Mozambique (2010)	0.46	10.73	0.44	
67	Jordan (2008)	0.43	10.07	0.44	
68	Montenegro (2011)	0.41	9.45	0.43	
69	Romania	0.39	9.01	0.42	
70	Thailand (2011)	0.39	8.95	0.41	
71	Ghana (2010)	0.38	8.68	0.40	
72	Chile (2012)	0.36	8.36	0.39	
73	Moldova, Rep.	0.36	8.20	0.38	
74	Ecuador (2011)	0.35	8.07	0.38	
75	Zambia (2008)	0.34	7.81	0.37	
76	Nepal (2010)	0.30	6.90	0.36	
77	Seychelles (2005)	0.30	6.90	0.35	
78	Sudan (2005)	0.30	6.81	0.34	●
79	Pakistan	0.29	6.52	0.33	
80	Bosnia and Herzegovina (2012)	0.27	6.16	0.32	
81	Mongolia	0.25	5.75	0.32	
82	Uruguay (2012)	0.24	5.44	0.31	
83	Armenia	0.24	5.34	0.30	
84	Colombia	0.23	5.12	0.29	
85	TFYR of Macedonia (2011)	0.22	5.06	0.28	○
86	Togo (2012)	0.22	4.96	0.27	
87	Nigeria (2007)	0.22	4.92	0.26	
88	Azerbaijan	0.21	4.74	0.26	
89	Burkina Faso (2009)	0.20	4.48	0.25	
90	Viet Nam (2011)	0.19	4.24	0.24	
91	Mauritius (2012)	0.18	4.02	0.23	○
92	Kazakhstan	0.18	4.00	0.22	
93	Panama (2011)	0.18	4.00	0.21	
94	Georgia (2005)	0.18	3.90	0.21	
95	Peru (2004)	0.16	3.47	0.20	○
96	Bolivia, Plurinational St. (2009)	0.16	3.44	0.19	
97	Sri Lanka (2010)	0.16	3.43	0.18	○
98	Kyrgyzstan (2011)	0.16	3.42	0.17	
99	Albania (2008)	0.15	3.37	0.16	
100	Namibia (2010)	0.14	3.11	0.15	
101	Gambia (2011)	0.13	2.87	0.15	
102	Oman (2011)	0.13	2.85	0.14	○
103	Burundi (2011)	0.12	2.58	0.13	
104	Tajikistan	0.12	2.50	0.12	
105	Philippines (2007)	0.11	2.31	0.11	○
106	Madagascar (2011)	0.11	2.23	0.10	
107	Kuwait (2012)	0.09	1.89	0.09	○
108	Paraguay (2012)	0.09	1.79	0.09	○
109	Indonesia (2009)	0.08	1.68	0.08	○
110	Saudi Arabia (2009)	0.07	1.44	0.07	○
111	Cabo Verde (2011)	0.07	1.42	0.06	○
112	Algeria (2005)	0.07	1.27	0.05	
113	Trinidad and Tobago (2012)	0.05	0.85	0.04	○
114	Guatemala (2012)	0.04	0.76	0.03	○
115	Bahrain	0.04	0.69	0.03	○
116	Honduras (2004)	0.04	0.68	0.02	○
117	El Salvador (2012)	0.03	0.42	0.01	○
118	Lesotho (2011)	0.01	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

2.3.3 QS university ranking average score top 3 universities

Average score of the top 3 universities at the QS world university ranking | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	United Kingdom	99.33	99.33	1.00	●
2	United States of America	99.20	99.20	0.99	●
3	Switzerland	88.97	88.97	0.99	●
4	Canada	88.77	88.77	0.98	●
5	Australia	86.83	86.83	0.97	●
6	Hong Kong (China)	84.67	84.67	0.96	
7	Japan	83.67	83.67	0.96	
8	France	80.47	80.47	0.95	●
9	Germany	80.20	80.20	0.94	
10	Korea, Rep.	79.83	79.83	0.94	
11	China	78.47	78.47	0.93	
12	Netherlands	76.73	76.73	0.92	
13	Sweden	73.47	73.47	0.91	
14	Denmark	72.70	72.70	0.91	
15	Belgium	66.33	66.33	0.90	
16	Ireland	62.47	62.47	0.89	
17	Finland	61.77	61.77	0.89	
18	New Zealand	59.70	59.70	0.88	
19	Norway	58.93	58.93	0.87	
20	Singapore	58.37	58.37	0.86	
21	Spain	57.57	57.57	0.86	
22	Israel	57.53	57.53	0.85	
23	Brazil	53.97	53.97	0.84	●
24	Italy	53.17	53.17	0.84	
25	Russian Federation	52.07	52.07	0.83	
26	Austria	49.77	49.77	0.82	
27	Malaysia	49.43	49.43	0.81	
28	India	46.97	46.97	0.81	●
29	Chile	46.83	46.83	0.80	
30	South Africa	45.97	45.97	0.79	
31	Saudi Arabia	45.43	45.43	0.79	
32	Argentina	43.80	43.80	0.78	●
33	Mexico	43.20	43.20	0.77	●
34	Colombia	41.43	41.43	0.76	
35	Portugal	40.37	40.37	0.76	
36	Thailand	40.17	40.17	0.75	
37	Czech Republic	35.47	35.47	0.74	
38	Kazakhstan	35.10	35.10	0.74	
39	Turkey	34.53	34.53	0.73	
40	United Arab Emirates	34.47	34.47	0.72	
41	Indonesia	32.90	32.90	0.71	●
42	Poland	32.83	32.83	0.71	
43	Lebanon	31.47	31.47	0.70	
44	Greece	31.43	31.43	0.69	
45	Philippines	29.93	29.93	0.69	●
46	Ukraine	29.40	29.40	0.68	
47	Egypt	27.90	27.90	0.67	●
48	Venezuela, Bolivarian Rep.	26.63	26.63	0.66	●
49	Hungary	25.33	25.33	0.66	
50	Peru	24.10	24.10	0.65	
51	Pakistan	22.10	22.10	0.64	●
52	Estonia	21.47	21.47	0.64	
53	Lithuania	19.90	19.90	0.63	
54	Azerbaijan	19.77	19.77	0.62	
55	Romania	17.07	17.07	0.61	
56	Iran, Islamic Rep.	15.63	15.63	0.61	
57	Belarus	15.50	15.50	0.60	
58	Jordan	14.70	14.70	0.59	
59	Bahrain	14.30	14.30	0.59	
60	Uruguay	13.97	13.97	0.58	
61	Slovenia	9.20	9.20	0.57	
62	Qatar	8.60	8.60	0.56	
63	Oman	8.30	8.30	0.56	
64	Croatia	7.93	7.93	0.55	
65	Bulgaria	7.33	7.33	0.54	
66	Sri Lanka	5.93	5.93	0.54	
67	Bangladesh	5.60	5.60	0.53	
68	Kuwait	5.03	5.03	0.52	
69	Kenya	4.93	4.93	0.51	
70	Serbia	4.47	4.47	0.51	
71	Tanzania, United Rep.	2.80	2.80	0.50	●
72	Ghana	2.27	2.27	0.49	
73	Albania	0.00	0.00	0.00	○
73	Algeria	0.00	0.00	0.00	○
73	Angola	0.00	0.00	0.00	○
73	Armenia	0.00	0.00	0.00	○
73	Barbados	0.00	0.00	0.00	○
73	Bhutan	0.00	0.00	0.00	○
73	Bolivia, Plurinational St.	0.00	0.00	0.00	○
73	Bosnia and Herzegovina	0.00	0.00	0.00	○
73	Botswana	0.00	0.00	0.00	○
73	Burkina Faso	0.00	0.00	0.00	○
73	Burundi	0.00	0.00	0.00	○
73	Cabo Verde	0.00	0.00	0.00	○
73	Cambodia	0.00	0.00	0.00	○
73	Cameroon	0.00	0.00	0.00	○
73	Costa Rica	0.00	0.00	0.00	○
73	Côte d'Ivoire	0.00	0.00	0.00	○
73	Cyprus	0.00	0.00	0.00	○
73	Dominican Republic	0.00	0.00	0.00	○
73	Ecuador	0.00	0.00	0.00	○
73	El Salvador	0.00	0.00	0.00	○
73	Ethiopia	0.00	0.00	0.00	○
73	Fiji	0.00	0.00	0.00	○
73	Gambia	0.00	0.00	0.00	○
73	Georgia	0.00	0.00	0.00	○
73	Guatemala	0.00	0.00	0.00	○
73	Guinea	0.00	0.00	0.00	○
73	Guyana	0.00	0.00	0.00	○
73	Honduras	0.00	0.00	0.00	○
73	Iceland	0.00	0.00	0.00	○
73	Jamaica	0.00	0.00	0.00	○
73	Kyrgyzstan	0.00	0.00	0.00	○
73	Latvia	0.00	0.00	0.00	○
73	Lesotho	0.00	0.00	0.00	○
73	Luxembourg	0.00	0.00	0.00	○
73	Madagascar	0.00	0.00	0.00	○
73	Malawi	0.00	0.00	0.00	○
73	Mali	0.00	0.00	0.00	○
73	Malta	0.00	0.00	0.00	○
73	Mauritius	0.00	0.00	0.00	○
73	Moldova, Rep.	0.00	0.00	0.00	○
73	Mongolia	0.00	0.00	0.00	○
73	Montenegro	0.00	0.00	0.00	○
73	Morocco	0.00	0.00	0.00	○
73	Mozambique	0.00	0.00	0.00	○
73	Myanmar	0.00	0.00	0.00	○
73	Namibia	0.00	0.00	0.00	○
73	Nepal	0.00	0.00	0.00	○
73	Nicaragua	0.00	0.00	0.00	○
73	Niger	0.00	0.00	0.00	○
73	Nigeria	0.00	0.00	0.00	○
73	Panama	0.00	0.00	0.00	○
73	Paraguay	0.00	0.00	0.00	○
73	Rwanda	0.00	0.00	0.00	○
73	Senegal	0.00	0.00	0.00	○
73	Seychelles	0.00	0.00	0.00	○
73	Slovakia	0.00	0.00	0.00	○
73	Sudan	0.00	0.00	0.00	○
73	Swaziland	0.00	0.00	0.00	○
73	Tajikistan	0.00	0.00	0.00	○
73	TFYR of Macedonia	0.00	0.00	0.00	○
73	Togo	0.00	0.00	0.00	○
73	Trinidad and Tobago	0.00	0.00	0.00	○
73	Tunisia	0.00	0.00	0.00	○
73	Uganda	0.00	0.00	0.00	○
73	Uzbekistan	0.00	0.00	0.00	○
73	Viet Nam	0.00	0.00	0.00	○
73	Yemen	0.00	0.00	0.00	○
73	Zambia	0.00	0.00	0.00	○
73	Zimbabwe	0.00	0.00	0.00	○

SOURCE: QS Quacquarelli Symonds Ltd, QS World University Ranking 2014/2015, Top Universities

NOTE: ● indicates a strength; ○ a weakness

3.1.1 ICT access

ICT access index | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Luxembourg	9.46	94.60	1.00	●
2	Switzerland	9.36	93.60	0.99	●
3	Iceland	9.28	92.80	0.99	●
4	Hong Kong (China)	9.24	92.40	0.98	
5	Germany	9.19	91.90	0.97	●
6	United Kingdom	9.18	91.80	0.96	
7	Malta	8.98	89.80	0.96	●
8	Korea, Rep.	8.94	89.40	0.95	
9	Netherlands	8.93	89.30	0.93	
9	Sweden	8.93	89.30	0.93	
11	Denmark	8.80	88.00	0.93	
12	France	8.65	86.50	0.92	●
13	Singapore	8.61	86.10	0.91	
14	Japan	8.40	84.00	0.90	
15	Norway	8.36	83.60	0.90	
16	Israel	8.31	83.10	0.89	
17	Austria	8.28	82.80	0.88	
18	Belgium	8.26	82.60	0.88	
19	Ireland	8.24	82.40	0.87	
20	Australia	8.23	82.30	0.86	
21	Qatar	8.09	80.90	0.85	
22	Canada	8.01	80.10	0.85	
23	Slovenia	7.91	79.10	0.84	
24	Barbados	7.86	78.60	0.83	
25	Estonia	7.82	78.20	0.82	
26	Finland	7.80	78.00	0.82	
27	New Zealand	7.79	77.90	0.81	
28	United States of America	7.78	77.80	0.80	
29	Bahrain	7.72	77.20	0.79	
30	Spain	7.70	77.00	0.79	
31	Portugal	7.67	76.70	0.77	
31	United Arab Emirates	7.67	76.70	0.77	
33	Italy	7.62	76.20	0.76	
34	Greece	7.53	75.30	0.76	
35	Belarus	7.39	73.90	0.75	
36	Hungary	7.32	73.20	0.74	
37	Croatia	7.31	73.10	0.74	
38	Latvia	7.29	72.90	0.73	
39	Czech Republic	7.26	72.60	0.72	
40	Russian Federation	7.25	72.50	0.71	
41	Serbia	7.22	72.20	0.71	
42	Oman	7.12	71.20	0.70	●
43	Uruguay	7.05	70.50	0.69	
44	Poland	7.04	70.40	0.68	
44	Saudi Arabia	7.04	70.40	0.68	
46	Slovakia	7.03	70.30	0.67	
47	Lithuania	7.00	70.00	0.66	
48	Cyprus	6.93	69.30	0.65	
49	Kazakhstan	6.84	68.40	0.65	
50	Bulgaria	6.77	67.70	0.64	
51	Montenegro	6.74	67.40	0.63	
52	Argentina	6.62	66.20	0.62	
52	Romania	6.62	66.20	0.62	
54	Malaysia	6.58	65.80	0.61	
55	Moldova, Rep.	6.56	65.60	0.60	
56	TFYR of Macedonia	6.55	65.50	0.60	
57	Seychelles	6.46	64.60	0.59	
58	Lebanon	6.45	64.50	0.58	
59	Trinidad and Tobago	6.36	63.60	0.57	
60	Chile	6.35	63.50	0.57	
61	Mauritius	6.32	63.20	0.56	
62	Costa Rica	6.27	62.70	0.55	
63	Ukraine	6.16	61.60	0.54	
64	Brazil	6.14	61.40	0.54	
65	Azerbaijan	6.07	60.70	0.53	
66	Georgia	5.99	59.90	0.52	
67	Turkey	5.83	58.30	0.51	
68	Armenia	5.64	56.40	0.51	
69	Bosnia and Herzegovina	5.63	56.30	0.49	
69	Morocco	5.63	56.30	0.49	
71	Iran, Islamic Rep.	5.53	55.30	0.48	
71	Panama	5.53	55.30	0.48	
73	Jordan	5.47	54.70	0.47	
74	Colombia	5.44	54.40	0.46	
75	Venezuela, Bolivarian Rep.	5.36	53.60	0.46	
76	Ecuador	5.16	51.60	0.45	
77	China	5.10	51.00	0.44	
78	Egypt	5.09	50.90	0.43	
79	Thailand	4.88	48.80	0.43	
80	South Africa	4.82	48.20	0.42	
81	Mexico	4.80	48.00	0.41	
82	Mongolia	4.79	47.90	0.40	
83	El Salvador	4.76	47.60	0.40	
84	Albania	4.62	46.20	0.39	
85	Fiji	4.60	46.00	0.38	
86	Jamaica	4.58	45.80	0.38	
87	Tunisia	4.56	45.60	0.37	
88	Cabo Verde	4.55	45.50	0.36	
89	Peru	4.54	45.40	0.35	
90	Paraguay	4.49	44.90	0.35	
91	Viet Nam	4.48	44.80	0.34	
92	Ghana	4.47	44.70	0.33	
93	Algeria	4.46	44.60	0.32	
94	Guatemala	4.35	43.50	0.32	
95	Indonesia	4.32	43.20	0.31	
96	Philippines	4.30	43.00	0.30	
97	Dominican Republic	4.15	41.50	0.29	
98	Bolivia, Plurinational St.	4.11	41.10	0.29	
99	Botswana	4.06	40.60	0.28	
100	Kyrgyzstan	4.05	40.50	0.27	
101	Guyana	4.04	40.40	0.26	
102	Nicaragua	3.98	39.80	0.26	
103	Honduras	3.94	39.40	0.25	
104	Namibia	3.93	39.30	0.24	
105	Sri Lanka	3.85	38.50	0.24	
106	Cambodia	3.73	37.30	0.23	
107	Mali	3.55	35.50	0.22	
108	Sudan	3.46	34.60	0.21	
109	Gambia	3.39	33.90	0.21	
110	Kenya	3.29	32.90	0.20	
111	Senegal	3.23	32.30	0.19	
112	Côte d'Ivoire	3.19	31.90	0.18	
113	Bhutan	3.18	31.80	0.18	
114	Zimbabwe	3.12	31.20	0.17	
115	India	3.05	30.50	0.16	
116	Pakistan	3.03	30.30	0.15	
117	Lesotho	3.02	30.20	0.14	
117	Swaziland	3.02	30.20	0.14	
119	Uzbekistan	2.95	29.50	0.13	
120	Cameroon	2.75	27.50	0.13	
121	Nepal	2.70	27.00	0.12	
122	Zambia	2.68	26.80	0.11	
123	Yemen	2.66	26.60	0.10	
124	Bangladesh	2.57	25.70	0.10	
125	Nigeria	2.53	25.30	0.09	
126	Angola	2.52	25.20	0.08	
127	Burkina Faso	2.46	24.60	0.07	○
128	Rwanda	2.43	24.30	0.07	○
129	Tanzania, United Rep.	2.37	23.70	0.06	○
130	Guinea	2.28	22.80	0.05	
131	Mozambique	2.21	22.10	0.04	○
132	Uganda	2.18	21.80	0.04	○
133	Niger	1.95	19.50	0.03	
134	Malawi	1.89	18.90	0.02	○
135	Ethiopia	1.87	18.70	0.01	○
136	Myanmar	1.85	18.50	0.01	○
137	Madagascar	1.68	16.80	0.00	○
n/a	Burundi	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	

SOURCE: International Telecommunication Union, *Measuring the Information Society 2014*, ICT Development Index 2014

NOTE: ● indicates a strength; ○ a weakness

3.1.2 ICT use

ICT use index | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Denmark	8.71	87.10	1.00	●
2	Sweden	8.29	82.90	0.99	●
3	Korea, Rep.	8.26	82.60	0.99	●
4	Finland	8.09	80.90	0.98	
5	Norway	8.07	80.70	0.97	●
6	United Kingdom	7.88	78.80	0.96	
7	Japan	7.80	78.00	0.96	
8	Luxembourg	7.66	76.60	0.95	
9	Iceland	7.65	76.50	0.94	
10	United States of America	7.50	75.00	0.93	
11	Australia	7.48	74.80	0.93	
12	Netherlands	7.43	74.30	0.92	
13	Hong Kong (China)	7.36	73.60	0.91	
14	Singapore	7.19	71.90	0.90	
15	New Zealand	7.10	71.00	0.90	
16	Bahrain	7.06	70.60	0.89	●
17	Estonia	6.77	67.70	0.88	
18	Switzerland	6.75	67.50	0.88	
19	France	6.74	67.40	0.87	
20	Canada	6.63	66.30	0.86	
21	United Arab Emirates	6.51	65.10	0.85	
22	Austria	6.28	62.80	0.85	
23	Ireland	6.24	62.40	0.84	
24	Germany	6.21	62.10	0.83	
25	Belgium	6.18	61.80	0.82	
26	Spain	6.04	60.40	0.82	
27	Qatar	5.95	59.50	0.81	
28	Latvia	5.91	59.10	0.80	
29	Croatia	5.62	56.20	0.79	●
30	Israel	5.53	55.30	0.79	
31	Malta	5.48	54.80	0.78	
32	Italy	5.38	53.80	0.77	
33	Lithuania	5.29	52.90	0.76	
34	Slovakia	5.28	52.80	0.76	
35	Czech Republic	5.22	52.20	0.75	
36	Slovenia	5.21	52.10	0.74	
37	Barbados	5.20	52.00	0.74	
38	Belarus	4.99	49.90	0.73	
39	Russian Federation	4.97	49.70	0.72	
40	Poland	4.94	49.40	0.71	
41	Bulgaria	4.77	47.70	0.70	
41	Saudi Arabia	4.77	47.70	0.70	
43	Hungary	4.67	46.70	0.69	
44	Greece	4.65	46.50	0.68	
44	Oman	4.65	46.50	0.68	
46	Portugal	4.61	46.10	0.67	
47	Uruguay	4.56	45.60	0.66	
48	Costa Rica	4.48	44.80	0.65	
49	Azerbaijan	4.40	44.00	0.65	
50	Cyprus	4.34	43.40	0.63	
50	Serbia	4.34	43.40	0.63	
52	Kazakhstan	4.33	43.30	0.62	
52	Lebanon	4.33	43.30	0.62	
54	TFYR of Macedonia	4.22	42.20	0.61	
55	Chile	4.08	40.80	0.60	
56	Brazil	4.01	40.10	0.60	
57	Moldova, Rep.	3.94	39.40	0.59	
58	Romania	3.87	38.70	0.58	
59	Bosnia and Herzegovina	3.71	37.10	0.57	
60	Trinidad and Tobago	3.60	36.00	0.57	
61	Argentina	3.42	34.20	0.56	
62	Montenegro	3.37	33.70	0.55	
63	Albania	3.26	32.60	0.54	
64	Turkey	3.24	32.40	0.54	
65	Malaysia	3.16	31.60	0.53	
66	Thailand	3.12	31.20	0.52	
67	Fiji	3.08	30.80	0.51	
68	Colombia	3.07	30.70	0.51	
69	Botswana	3.03	30.30	0.50	
70	Armenia	3.02	30.20	0.49	
71	China	2.99	29.90	0.49	
72	Mauritius	2.97	29.70	0.48	
73	Cabo Verde	2.90	29.00	0.47	
74	Egypt	2.87	28.70	0.46	
75	South Africa	2.75	27.50	0.46	
76	Seychelles	2.74	27.40	0.45	
77	Panama	2.70	27.00	0.44	
78	Dominican Republic	2.65	26.50	0.43	
79	Jamaica	2.62	26.20	0.43	
80	Tunisia	2.59	25.90	0.42	
81	Ecuador	2.58	25.80	0.40	
81	Georgia	2.58	25.80	0.40	
83	Morocco	2.50	25.00	0.39	
83	Viet Nam	2.50	25.00	0.39	
85	Mexico	2.45	24.50	0.38	
86	Venezuela, Bolivarian Rep.	2.36	23.60	0.38	
87	Philippines	2.28	22.80	0.37	
88	Jordan	2.22	22.20	0.36	
89	Ukraine	2.11	21.10	0.35	
90	Uzbekistan	2.09	20.90	0.35	
91	Zimbabwe	1.92	19.20	0.34	
92	Bolivia, Plurinational St.	1.86	18.60	0.33	
93	Indonesia	1.80	18.00	0.32	
94	Ghana	1.76	17.60	0.32	
95	Mongolia	1.69	16.90	0.30	
95	Peru	1.69	16.90	0.30	
97	Bhutan	1.67	16.70	0.29	
97	Namibia	1.67	16.70	0.29	
99	Sudan	1.65	16.50	0.28	●
100	Nigeria	1.60	16.00	0.27	
101	Kyrgyzstan	1.59	15.90	0.26	
102	Paraguay	1.50	15.00	0.26	
103	Iran, Islamic Rep.	1.44	14.40	0.25	
104	Kenya	1.41	14.10	0.24	
105	Guyana	1.36	13.60	0.24	
106	El Salvador	1.27	12.70	0.23	
107	Senegal	1.25	12.50	0.22	
108	Sri Lanka	1.10	11.00	0.21	
109	Angola	1.06	10.60	0.21	
110	Honduras	1.03	10.30	0.20	
111	Swaziland	0.99	9.90	0.19	
112	Guatemala	0.96	9.60	0.18	
113	Nepal	0.92	9.20	0.18	
114	Uganda	0.83	8.30	0.17	
115	Algeria	0.73	7.30	0.15	
115	Yemen	0.73	7.30	0.15	
117	India	0.68	6.80	0.14	
117	Nicaragua	0.68	6.80	0.14	
119	Cambodia	0.55	5.50	0.13	
119	Lesotho	0.55	5.50	0.13	
121	Zambia	0.54	5.40	0.12	
122	Gambia	0.51	5.10	0.11	
123	Rwanda	0.49	4.90	0.10	
124	Burkina Faso	0.45	4.50	0.10	
125	Pakistan	0.42	4.20	0.09	
126	Malawi	0.31	3.10	0.08	○
127	Cameroon	0.28	2.80	0.07	○
128	Bangladesh	0.27	2.70	0.07	
129	Ethiopia	0.24	2.40	0.04	
129	Mozambique	0.24	2.40	0.04	○
129	Tanzania, United Rep.	0.24	2.40	0.04	○
132	Côte d'Ivoire	0.16	1.60	0.04	○
133	Mali	0.14	1.40	0.03	○
134	Madagascar	0.09	0.90	0.01	○
134	Niger	0.09	0.90	0.01	○
136	Myanmar	0.08	0.80	0.01	○
137	Guinea	0.05	0.50	0.00	○
n/a	Burundi	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	

SOURCE: International Telecommunication Union, *Measuring the Information Society 2014*, ICT Development Index 2014

NOTE: ● indicates a strength; ○ a weakness

3.1.3 Government's online service

Government's online service index | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	France	1.00	100.00	1.00	●
2	Singapore	0.99	99.21	0.99	●
3	Korea, Rep.	0.98	97.64	0.99	●
4	Japan	0.94	94.49	0.96	●
4	Spain	0.94	94.49	0.96	●
4	United States of America	0.94	94.49	0.96	
7	Bahrain	0.94	93.70	0.96	●
8	Australia	0.93	92.91	0.94	
8	Netherlands	0.93	92.91	0.94	
10	Canada	0.91	91.34	0.94	
11	United Kingdom	0.90	89.76	0.93	
12	United Arab Emirates	0.88	88.19	0.92	●
13	Israel	0.87	87.40	0.91	
14	Uruguay	0.85	85.04	0.91	●
15	New Zealand	0.84	84.25	0.90	
16	Chile	0.82	81.89	0.89	●
17	Colombia	0.79	78.74	0.88	●
18	Estonia	0.77	77.17	0.86	
18	Finland	0.77	77.17	0.86	
18	Saudi Arabia	0.77	77.17	0.86	●
21	Lithuania	0.76	75.59	0.85	●
21	Norway	0.76	75.59	0.85	
23	Austria	0.75	74.80	0.83	
23	Italy	0.75	74.80	0.83	
23	Kazakhstan	0.75	74.80	0.83	●
26	Oman	0.73	73.23	0.82	●
27	Russian Federation	0.71	70.87	0.81	
28	Latvia	0.70	70.08	0.80	
28	Sweden	0.70	70.08	0.80	
30	Morocco	0.69	69.29	0.79	●
31	Belgium	0.68	67.72	0.77	
31	Ireland	0.68	67.72	0.77	
31	Malaysia	0.68	67.72	0.77	
34	Germany	0.67	66.93	0.76	
35	Denmark	0.66	66.14	0.75	
35	Mexico	0.66	66.14	0.75	
37	Qatar	0.65	65.35	0.73	
37	Sri Lanka	0.65	65.35	0.73	●
39	Portugal	0.64	63.78	0.72	
39	Tunisia	0.64	63.78	0.72	●
41	Peru	0.63	62.99	0.71	
42	Luxembourg	0.62	62.20	0.71	
43	Armenia	0.61	61.42	0.68	
43	Costa Rica	0.61	61.42	0.68	
43	Iceland	0.61	61.42	0.68	
43	Mongolia	0.61	61.42	0.68	
47	China	0.61	60.63	0.66	
47	Greece	0.61	60.63	0.66	
49	Brazil	0.60	59.84	0.65	
49	Georgia	0.60	59.84	0.65	
51	Egypt	0.59	59.06	0.64	●
52	Kuwait	0.57	57.48	0.63	
53	Hungary	0.56	55.91	0.62	
53	Turkey	0.56	55.91	0.62	
55	Argentina	0.55	55.12	0.60	
55	Venezuela, Bolivarian Rep.	0.55	55.12	0.60	●
57	India	0.54	54.33	0.59	
57	Poland	0.54	54.33	0.59	
59	El Salvador	0.54	53.54	0.58	
60	Moldova, Rep.	0.53	52.76	0.57	
60	Montenegro	0.53	52.76	0.57	
62	Jordan	0.52	51.97	0.56	
63	Rwanda	0.51	51.18	0.55	
64	Switzerland	0.50	50.39	0.55	○
65	Slovakia	0.49	48.82	0.54	
66	Ecuador	0.48	48.03	0.53	
66	Philippines	0.48	48.03	0.53	
68	Cyprus	0.47	47.24	0.51	
68	Mauritius	0.47	47.24	0.51	
70	Croatia	0.46	46.46	0.50	
71	Ethiopia	0.46	45.67	0.50	●
72	Albania	0.45	44.88	0.48	
72	Uzbekistan	0.45	44.88	0.48	
74	Romania	0.44	44.09	0.47	
74	Thailand	0.44	44.09	0.47	
76	Azerbaijan	0.43	43.31	0.46	
77	Kenya	0.43	42.52	0.45	
77	Slovenia	0.43	42.52	0.45	
79	Viet Nam	0.42	41.73	0.44	
80	Honduras	0.40	40.16	0.42	
80	Malta	0.40	40.16	0.42	
82	Bolivia, Plurinational St.	0.39	39.37	0.40	
82	Fiji	0.39	39.37	0.40	
82	Serbia	0.39	39.37	0.40	
85	Dominican Republic	0.39	38.58	0.39	
85	South Africa	0.39	38.58	0.39	
87	Czech Republic	0.37	37.01	0.37	○
87	Iran, Islamic Rep.	0.37	37.01	0.37	
87	Panama	0.37	37.01	0.37	
90	Indonesia	0.36	36.22	0.36	
91	Lebanon	0.35	35.43	0.35	
92	Bangladesh	0.35	34.65	0.35	
93	Seychelles	0.33	33.07	0.33	
93	Trinidad and Tobago	0.33	33.07	0.33	
95	Belarus	0.32	32.28	0.31	
95	Namibia	0.32	32.28	0.31	
95	Pakistan	0.32	32.28	0.31	
98	Ghana	0.31	31.50	0.29	
98	Jamaica	0.31	31.50	0.29	
98	Mozambique	0.31	31.50	0.29	
101	Botswana	0.31	30.71	0.25	
101	Nigeria	0.31	30.71	0.25	
101	Senegal	0.31	30.71	0.25	
101	Yemen	0.31	30.71	0.25	
101	Zimbabwe	0.31	30.71	0.25	
106	Angola	0.30	29.92	0.23	
106	Burkina Faso	0.30	29.92	0.23	
106	Tanzania, United Rep.	0.30	29.92	0.23	
109	Sudan	0.29	29.13	0.22	
110	Bosnia and Herzegovina	0.28	28.35	0.22	
111	Kyrgyzstan	0.28	27.56	0.21	
112	Ukraine	0.27	26.77	0.20	○
113	Bhutan	0.24	24.41	0.17	
113	Guyana	0.24	24.41	0.17	
113	Madagascar	0.24	24.41	0.17	
113	TFYR of Macedonia	0.24	24.41	0.17	○
117	Bulgaria	0.24	23.62	0.17	○
118	Paraguay	0.23	22.83	0.16	
119	Barbados	0.22	22.05	0.15	○
120	Gambia	0.20	20.47	0.14	
121	Cameroon	0.20	19.69	0.14	
122	Cambodia	0.17	17.32	0.12	○
122	Côte d'Ivoire	0.17	17.32	0.12	
122	Malawi	0.17	17.32	0.12	
125	Cabo Verde	0.17	16.54	0.11	
126	Lesotho	0.16	15.75	0.09	
126	Nepal	0.16	15.75	0.09	○
128	Guatemala	0.15	14.96	0.08	
128	Uganda	0.15	14.96	0.08	
130	Zambia	0.14	14.17	0.07	○
131	Mali	0.13	13.39	0.06	
131	Swaziland	0.13	13.39	0.06	○
133	Niger	0.13	12.60	0.05	
134	Togo	0.11	11.02	0.04	○
135	Nicaragua	0.09	9.45	0.04	○
136	Algeria	0.08	7.87	0.03	○
137	Tajikistan	0.06	6.30	0.02	○
138	Myanmar	0.02	2.36	0.01	
139	Burundi	0.02	1.57	0.01	○
140	Guinea	0.00	0.00	0.00	○
n/a	Hong Kong (China)	n/a	n/a	n/a	

SOURCE: United Nations Public Administration Network, *e-Government Survey 2014*

NOTE: ● indicates a strength; ○ a weakness

3.1.4 Online e-participation

E-participation index | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Korea, Rep.	1.00	100.00	0.99	●
1	Netherlands	1.00	100.00	0.99	●
3	Uruguay	0.98	98.04	0.99	●
4	France	0.96	96.08	0.96	●
4	Japan	0.96	96.08	0.96	●
4	United Kingdom	0.96	96.08	0.96	●
7	Australia	0.94	94.12	0.95	
7	Chile	0.94	94.12	0.95	●
9	United States of America	0.92	92.16	0.94	
10	Singapore	0.90	90.20	0.94	
11	Colombia	0.88	88.24	0.93	●
12	Israel	0.86	86.27	0.92	
13	United Arab Emirates	0.84	84.31	0.91	●
14	Bahrain	0.82	82.35	0.89	●
14	Canada	0.82	82.35	0.89	
14	Costa Rica	0.82	82.35	0.89	●
17	Greece	0.80	80.39	0.88	●
17	Morocco	0.80	80.39	0.88	●
19	Italy	0.78	78.43	0.86	●
19	New Zealand	0.78	78.43	0.86	
19	Spain	0.78	78.43	0.86	
22	Estonia	0.76	76.47	0.84	
22	Kazakhstan	0.76	76.47	0.84	●
24	Brazil	0.71	70.59	0.80	●
24	Finland	0.71	70.59	0.80	
24	Germany	0.71	70.59	0.80	
24	Latvia	0.71	70.59	0.80	
24	Oman	0.71	70.59	0.80	●
24	Peru	0.71	70.59	0.80	●
30	Mongolia	0.69	68.63	0.78	
30	Norway	0.69	68.63	0.78	
30	Russian Federation	0.69	68.63	0.78	
33	China	0.65	64.71	0.73	
33	Ireland	0.65	64.71	0.73	
33	Kenya	0.65	64.71	0.73	
33	Lithuania	0.65	64.71	0.73	
33	Portugal	0.65	64.71	0.73	
33	Sri Lanka	0.65	64.71	0.73	●
33	Tunisia	0.65	64.71	0.73	●
40	Austria	0.63	62.75	0.69	
40	Belgium	0.63	62.75	0.69	
40	India	0.63	62.75	0.69	
40	Moldova, Rep.	0.63	62.75	0.69	
40	Slovakia	0.63	62.75	0.69	
45	El Salvador	0.61	60.78	0.66	●
45	Mexico	0.61	60.78	0.66	
45	Qatar	0.61	60.78	0.66	
45	Sweden	0.61	60.78	0.66	
49	Georgia	0.59	58.82	0.65	
49	Montenegro	0.59	58.82	0.65	
51	Philippines	0.57	56.86	0.63	
51	Saudi Arabia	0.57	56.86	0.63	
51	Venezuela, Bolivarian Rep.	0.57	56.86	0.63	●
54	Argentina	0.55	54.90	0.59	
54	Denmark	0.55	54.90	0.59	○
54	Egypt	0.55	54.90	0.59	
54	Luxembourg	0.55	54.90	0.59	
54	Thailand	0.55	54.90	0.59	
59	Albania	0.53	52.94	0.56	
59	Armenia	0.53	52.94	0.56	
59	Malaysia	0.53	52.94	0.56	
59	Mauritius	0.53	52.94	0.56	
63	Rwanda	0.51	50.98	0.55	
64	Ecuador	0.49	49.02	0.51	
64	Iceland	0.49	49.02	0.51	
64	Panama	0.49	49.02	0.51	
64	Poland	0.49	49.02	0.51	
64	Turkey	0.49	49.02	0.51	
64	Viet Nam	0.49	49.02	0.51	
70	Jordan	0.47	47.06	0.48	
70	Malta	0.47	47.06	0.48	
70	Romania	0.47	47.06	0.48	
70	Uzbekistan	0.47	47.06	0.48	
74	Hungary	0.45	45.10	0.47	
74	Zimbabwe	0.45	45.10	0.47	
76	Azerbaijan	0.43	43.14	0.45	
76	Kuwait	0.43	43.14	0.45	
76	Ukraine	0.43	43.14	0.45	
79	Bolivia, Plurinational St.	0.41	41.18	0.42	
79	Kyrgyzstan	0.41	41.18	0.42	
79	Serbia	0.41	41.18	0.42	
82	Bangladesh	0.39	39.22	0.39	
82	Fiji	0.39	39.22	0.39	
82	Ghana	0.39	39.22	0.39	
82	Slovenia	0.39	39.22	0.39	○
82	Tanzania, United Rep.	0.39	39.22	0.39	
87	Switzerland	0.37	37.25	0.38	○
88	Belarus	0.35	35.29	0.35	
88	Bhutan	0.35	35.29	0.35	
88	Madagascar	0.35	35.29	0.35	
88	Senegal	0.35	35.29	0.35	
92	Croatia	0.33	33.33	0.29	○
92	Dominican Republic	0.33	33.33	0.29	
92	Guyana	0.33	33.33	0.29	
92	Honduras	0.33	33.33	0.29	
92	Mozambique	0.33	33.33	0.29	
92	Namibia	0.33	33.33	0.29	
92	Nigeria	0.33	33.33	0.29	
92	Pakistan	0.33	33.33	0.29	
92	South Africa	0.33	33.33	0.29	○
101	Botswana	0.31	31.37	0.27	
101	Cyprus	0.31	31.37	0.27	○
101	Trinidad and Tobago	0.31	31.37	0.27	
104	Indonesia	0.29	29.41	0.24	
104	Iran, Islamic Rep.	0.29	29.41	0.24	
104	Lebanon	0.29	29.41	0.24	
104	Nepal	0.29	29.41	0.24	
108	Sudan	0.27	27.45	0.22	
108	Yemen	0.27	27.45	0.22	
110	Bulgaria	0.25	25.49	0.19	○
110	Czech Republic	0.25	25.49	0.19	○
110	Ethiopia	0.25	25.49	0.19	
110	Paraguay	0.25	25.49	0.19	
110	Seychelles	0.25	25.49	0.19	○
115	Angola	0.24	23.53	0.16	
115	Bosnia and Herzegovina	0.24	23.53	0.16	○
115	Malawi	0.24	23.53	0.16	
115	Niger	0.24	23.53	0.16	
119	Gambia	0.22	21.57	0.14	
119	TFYR of Macedonia	0.22	21.57	0.14	○
121	Cambodia	0.20	19.61	0.12	
121	Guatemala	0.20	19.61	0.12	
121	Jamaica	0.20	19.61	0.12	○
124	Côte d'Ivoire	0.18	17.65	0.11	○
124	Zambia	0.18	17.65	0.11	
126	Cameroon	0.16	15.69	0.09	
126	Mali	0.16	15.69	0.09	
126	Swaziland	0.16	15.69	0.09	○
129	Burkina Faso	0.14	13.73	0.06	○
129	Lesotho	0.14	13.73	0.06	○
129	Uganda	0.14	13.73	0.06	○
132	Tajikistan	0.12	11.76	0.06	○
133	Barbados	0.10	9.80	0.03	○
133	Cabo Verde	0.10	9.80	0.03	○
133	Nicaragua	0.10	9.80	0.03	○
133	Togo	0.10	9.80	0.03	○
137	Algeria	0.08	7.84	0.01	○
137	Myanmar	0.08	7.84	0.01	
139	Burundi	0.06	5.88	0.01	○
140	Guinea	0.02	1.96	0.00	○
n/a	Hong Kong (China)	n/a	n/a	n/a	

SOURCE: United Nations Public Administration Network, *e-Government Survey 2014*

NOTE: ● indicates a strength; ○ a weakness

3.2.1 Electricity output

Electricity output (kWh per capita) | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Iceland (2013)	56,612.50	100.00	0.98	●
1	Kuwait	19,278.46	100.00	0.98	●
1	Norway (2013)	26,317.91	100.00	0.98	●
4	Bahrain	18,765.15	97.34	0.98	●
5	Canada (2013)	18,511.78	96.02	0.97	●
6	Qatar	16,969.27	88.01	0.96	●
7	Sweden (2013)	15,884.17	82.38	0.95	
8	United States of America (2013)	13,492.68	69.96	0.94	
9	Finland (2013)	13,035.85	67.59	0.93	
10	United Arab Emirates	10,958.41	56.81	0.93	●
11	Korea, Rep. (2013)	10,643.90	55.17	0.92	
12	Australia (2013)	10,544.53	54.66	0.91	
13	Estonia (2013)	9,918.66	51.41	0.90	
14	Saudi Arabia	9,603.39	49.77	0.89	●
15	New Zealand (2013)	9,456.35	49.01	0.89	
16	Paraguay	9,003.59	46.66	0.88	●
17	Singapore	8,835.40	45.78	0.87	
18	France (2013)	8,672.89	44.94	0.86	
19	Switzerland (2013)	8,540.27	44.25	0.85	
20	Japan (2013)	8,257.65	42.78	0.84	
21	Czech Republic (2013)	8,199.33	42.48	0.84	
22	Israel (2013)	7,758.06	40.19	0.83	
23	Slovenia (2013)	7,666.50	39.71	0.82	
24	Germany (2013)	7,660.85	39.69	0.81	
25	Austria (2013)	7,618.89	39.47	0.80	
26	Oman	7,558.01	39.15	0.80	●
27	Russian Federation	7,450.10	38.59	0.79	
28	Belgium (2013)	7,430.51	38.49	0.78	
29	Trinidad and Tobago	6,814.93	35.29	0.77	●
30	Bulgaria	6,371.96	32.99	0.76	
31	Denmark (2013)	6,164.17	31.92	0.75	
32	Spain (2013)	6,118.66	31.68	0.75	
33	Netherlands (2013)	5,879.46	30.44	0.74	
34	Ireland (2013)	5,561.90	28.79	0.73	
35	United Kingdom (2013)	5,519.52	28.57	0.72	
36	Cyprus	5,484.88	28.39	0.71	
37	Malta	5,452.38	28.22	0.70	
38	Kazakhstan	5,432.22	28.12	0.70	
39	Hong Kong (China)	5,423.88	28.07	0.69	
40	Slovakia (2013)	5,216.64	27.00	0.68	
41	Greece (2013)	5,194.15	26.88	0.67	
42	Serbia	5,009.83	25.92	0.66	
43	South Africa	4,878.56	25.24	0.66	
44	Portugal (2013)	4,818.80	24.93	0.65	
45	Italy (2013)	4,685.36	24.24	0.64	
46	Malaysia	4,595.79	23.77	0.63	
47	Montenegro	4,587.10	23.73	0.62	
48	Ukraine	4,351.02	22.50	0.61	
49	Chile (2013)	4,282.74	22.15	0.61	
50	Poland (2013)	4,255.93	22.01	0.60	
51	Venezuela, Bolivarian Rep.	4,222.83	21.84	0.59	
52	China	3,690.51	19.07	0.58	
53	Bosnia and Herzegovina	3,676.76	19.00	0.57	
54	Lebanon	3,346.73	17.29	0.57	
55	Iran, Islamic Rep.	3,327.35	17.19	0.56	
56	Luxembourg (2013)	3,301.82	17.06	0.55	
57	Argentina	3,280.02	16.94	0.54	
58	Belarus	3,255.71	16.82	0.53	
59	Turkey (2013)	3,179.39	16.42	0.52	
60	Uruguay	3,117.65	16.10	0.52	
61	Hungary (2013)	3,065.22	15.83	0.51	
62	Latvia	3,038.42	15.69	0.50	
63	TFYR of Macedonia	2,967.77	15.32	0.49	
64	Romania	2,926.99	15.11	0.48	
65	Brazil	2,780.98	14.35	0.48	
66	Armenia	2,705.72	13.96	0.47	
67	Kyrgyzstan	2,703.74	13.95	0.46	
68	Jordan	2,625.95	13.55	0.45	
69	Mexico (2013)	2,518.70	12.99	0.44	
70	Thailand	2,494.70	12.86	0.43	
71	Azerbaijan	2,471.83	12.75	0.43	
72	Croatia	2,434.43	12.55	0.42	
73	Panama	2,264.74	11.67	0.41	
74	Mauritius	2,168.22	11.17	0.40	
75	Georgia	2,159.24	11.12	0.39	
76	Tajikistan	2,119.10	10.91	0.39	
77	Costa Rica	2,115.38	10.90	0.38	
78	Egypt	2,036.22	10.48	0.37	
79	Uzbekistan	1,762.93	9.07	0.36	
80	Mongolia	1,720.00	8.84	0.35	
81	Tunisia	1,668.37	8.57	0.34	
82	Dominican Republic	1,650.39	8.48	0.34	
83	Moldova, Rep.	1,629.78	8.37	0.33	
84	Jamaica	1,578.23	8.11	0.32	
85	Lithuania	1,514.72	7.78	0.31	
86	Albania	1,495.25	7.68	0.30	
87	Algeria	1,491.61	7.66	0.30	
88	Ecuador	1,474.95	7.57	0.29	
89	Viet Nam	1,383.86	7.10	0.28	
90	Peru	1,330.74	6.82	0.27	
91	Colombia	1,306.86	6.70	0.26	
92	Honduras	956.30	4.88	0.25	
93	El Salvador	931.11	4.75	0.25	
94	India	911.77	4.65	0.24	
95	Zambia	841.62	4.28	0.23	
96	Morocco	840.56	4.28	0.22	○
97	Indonesia	793.55	4.03	0.21	
98	Philippines	754.02	3.83	0.20	
99	Bolivia, Plurinational St.	729.62	3.70	0.20	
100	Namibia	726.99	3.69	0.19	
101	Nicaragua	672.95	3.41	0.18	
102	Zimbabwe	662.39	3.35	0.17	
103	Guatemala	624.14	3.15	0.16	
104	Mozambique	601.83	3.04	0.16	
105	Sri Lanka	585.39	2.95	0.15	○
106	Pakistan	536.53	2.70	0.14	
107	Ghana	473.95	2.37	0.13	
108	Côte d'Ivoire	353.63	1.75	0.12	
109	Bangladesh	316.99	1.56	0.11	
110	Cameroon	290.41	1.42	0.11	
111	Yemen	275.85	1.35	0.10	
112	Angola	269.60	1.31	0.09	
113	Senegal	251.27	1.22	0.08	○
114	Myanmar	203.26	0.97	0.07	
115	Sudan	196.46	0.93	0.07	
116	Kenya	191.99	0.91	0.06	○
117	Nigeria	170.03	0.80	0.05	
118	Nepal	129.30	0.58	0.04	○
119	Botswana	125.00	0.56	0.03	○
120	Tanzania, United Rep.	121.29	0.54	0.02	○
121	Cambodia	96.44	0.41	0.02	○
122	Ethiopia	73.04	0.29	0.01	○
123	Togo	16.72	0.00	0.00	○
n/a	Barbados	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	

SOURCE: International Energy Agency (IEA) Statistics© OECD/IEA, 2014

NOTE: ● indicates a strength; ○ a weakness

3.2.2 Logistics performance

Logistics Performance Index | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Germany	4.12	100.00	1.00	●
2	Netherlands	4.05	96.22	0.99	●
3	Belgium	4.04	96.06	0.98	●
4	United Kingdom	4.01	94.53	0.98	●
5	Singapore	4.00	94.01	0.97	
6	Sweden	3.96	91.81	0.96	●
7	Norway	3.96	91.65	0.95	●
8	Luxembourg	3.95	91.06	0.95	
9	United States of America	3.92	89.59	0.94	
10	Japan	3.91	89.43	0.93	
11	Ireland	3.87	87.05	0.92	
12	Canada	3.86	86.41	0.92	
13	France	3.85	85.99	0.91	●
14	Switzerland	3.84	85.82	0.90	
15	Hong Kong (China)	3.83	84.95	0.89	
16	Australia	3.81	84.13	0.88	
17	Denmark	3.78	82.69	0.88	
18	Spain	3.72	79.43	0.87	
19	Italy	3.69	78.03	0.86	●
20	Korea, Rep.	3.67	76.76	0.85	
21	Austria	3.65	75.86	0.85	
22	New Zealand	3.64	75.62	0.84	
23	Finland	3.62	74.56	0.83	
24	Malaysia	3.59	72.89	0.82	
25	Portugal	3.56	71.36	0.82	
26	United Arab Emirates	3.54	70.28	0.81	
27	China	3.53	69.89	0.80	
28	Qatar	3.52	69.13	0.79	
29	Turkey	3.50	68.29	0.78	●
30	Poland	3.49	67.97	0.78	
31	Czech Republic	3.49	67.90	0.77	
32	Hungary	3.46	66.47	0.76	
33	South Africa	3.43	64.78	0.75	
34	Thailand	3.43	64.69	0.75	
35	Latvia	3.40	63.33	0.74	
36	Iceland	3.39	62.77	0.73	
37	Slovenia	3.38	62.33	0.72	
38	Estonia	3.35	60.43	0.72	
39	Israel	3.26	56.07	0.71	
40	Chile	3.26	55.83	0.70	
41	Slovakia	3.25	55.77	0.69	
42	Greece	3.20	53.07	0.68	
43	Panama	3.19	52.67	0.68	
44	Lithuania	3.18	51.88	0.67	
45	Bulgaria	3.16	50.80	0.66	
46	Viet Nam	3.15	50.68	0.65	
47	Saudi Arabia	3.15	50.36	0.65	
48	Mexico	3.13	49.33	0.64	
49	Malta	3.11	48.21	0.63	
50	Bahrain	3.08	47.02	0.62	
51	Indonesia	3.08	46.96	0.62	
52	India	3.08	46.87	0.61	
53	Croatia	3.05	45.49	0.60	
54	Kuwait	3.01	43.36	0.59	
55	Philippines	3.00	42.98	0.58	
56	Cyprus	3.00	42.82	0.58	
57	Oman	3.00	42.53	0.57	
58	Argentina	2.99	42.10	0.56	
59	Ukraine	2.98	41.58	0.55	
60	Egypt	2.97	41.05	0.55	
61	Serbia	2.96	40.88	0.54	
62	El Salvador	2.96	40.77	0.53	
63	Brazil	2.94	39.93	0.52	
64	Montenegro	2.88	36.44	0.52	
65	Jordan	2.87	36.36	0.51	
66	Dominican Republic	2.86	35.67	0.50	
67	Jamaica	2.84	34.75	0.49	
68	Peru	2.84	34.66	0.48	
69	Pakistan	2.83	33.88	0.48	
70	Malawi	2.81	33.25	0.47	
71	Kenya	2.81	33.20	0.46	
72	Nigeria	2.81	33.03	0.45	
73	Venezuela, Bolivarian Rep.	2.81	33.00	0.45	
74	Guatemala	2.80	32.46	0.44	
75	Paraguay	2.78	31.55	0.43	
76	Côte d'Ivoire	2.76	30.65	0.42	●
77	Rwanda	2.76	30.50	0.42	
78	Bosnia and Herzegovina	2.75	29.92	0.41	
79	Cambodia	2.74	29.60	0.40	
80	Lebanon	2.73	28.80	0.39	
81	Ecuador	2.71	28.05	0.38	
82	Costa Rica	2.70	27.52	0.38	
83	Kazakhstan	2.70	27.46	0.37	
84	Sri Lanka	2.70	27.25	0.36	
85	Russian Federation	2.69	27.21	0.35	
86	Uruguay	2.68	26.40	0.35	
87	Armenia	2.67	26.10	0.34	
88	Namibia	2.66	25.34	0.33	
89	Moldova, Rep.	2.65	25.11	0.32	
90	Nicaragua	2.65	25.11	0.32	
91	Algeria	2.65	24.91	0.31	
92	Colombia	2.64	24.41	0.30	
93	Burkina Faso	2.64	24.34	0.29	
94	Belarus	2.64	24.33	0.28	
95	Ghana	2.63	23.76	0.28	
96	Senegal	2.62	23.52	0.27	
97	Honduras	2.61	22.77	0.26	
98	Ethiopia	2.59	22.06	0.25	
99	Nepal	2.59	21.77	0.25	
100	Burundi	2.57	20.64	0.24	
101	Bangladesh	2.56	20.52	0.23	
102	Tunisia	2.55	19.89	0.22	
103	Fiji	2.55	19.58	0.22	
104	Angola	2.54	19.48	0.21	
105	Tajikistan	2.53	18.69	0.20	
106	Mauritius	2.51	18.05	0.19	○
107	Georgia	2.51	17.67	0.18	○
108	TFYR of Macedonia	2.50	17.25	0.18	○
109	Mali	2.50	17.05	0.17	
110	Botswana	2.49	16.92	0.16	
111	Bolivia, Plurinational St.	2.48	16.31	0.15	
112	Guinea	2.46	15.46	0.15	
113	Zambia	2.46	15.39	0.14	
114	Guyana	2.46	15.21	0.13	
115	Azerbaijan	2.45	14.66	0.12	○
116	Uzbekistan	2.39	11.92	0.12	
117	Niger	2.39	11.85	0.11	
118	Madagascar	2.38	11.29	0.10	
119	Lesotho	2.37	10.81	0.09	
120	Mongolia	2.36	9.93	0.08	○
121	Zimbabwe	2.34	9.09	0.08	
122	Tanzania, United Rep.	2.33	8.66	0.07	○
123	Togo	2.32	8.03	0.06	
124	Cameroon	2.30	6.92	0.05	○
125	Bhutan	2.29	6.59	0.05	○
126	Myanmar	2.25	4.54	0.04	
127	Gambia	2.25	4.49	0.03	○
128	Mozambique	2.23	3.47	0.02	○
129	Kyrgyzstan	2.21	2.47	0.02	○
130	Yemen	2.18	1.17	0.01	○
131	Sudan	2.16	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Morocco	n/a	n/a	n/a	
n/a	Romania	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	

SOURCE: World Bank and Turku School of Economics, *Logistics Performance Index 2014*; Arvis et al., 2014, *Connecting to Compete 2014: Trade Logistics in the Global Economy*

NOTE: ● indicates a strength; ○ a weakness

3.2.3 Gross capital formation

Gross capital formation (% of GDP) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Mongolia	54.31	100.00	1.00	●
2	Bhutan	51.53	93.97	0.99	●
3	Mozambique	50.09	90.85	0.99	●
4	China	47.68	85.63	0.98	●
5	Niger	46.40	82.86	0.97	●
6	Iran, Islamic Rep.	43.04	75.56	0.96	●
7	Cabo Verde	39.40	67.68	0.96	●
8	Belarus	37.74	64.10	0.95	●
9	Algeria	37.66	63.90	0.94	●
10	Seychelles	35.97	60.26	0.94	●
11	Lesotho	35.62	59.50	0.93	●
12	Morocco	34.32	56.68	0.92	●
13	Indonesia	33.40	54.69	0.91	●
14	India	32.17	52.01	0.91	●
15	Sri Lanka	31.97	51.58	0.90	●
16	Botswana	31.88	51.39	0.89	●
17	Zambia	31.86	51.34	0.88	●
18	Tanzania, United Rep.	31.55	50.67	0.88	●
19	Uzbekistan	30.85	49.16	0.87	●
20	Saudi Arabia	30.75	48.94	0.86	●
21	Ethiopia	30.10	47.54	0.86	●
22	Panama	29.80	46.89	0.85	●
23	Singapore	29.23	45.65	0.84	
24	Bangladesh	29.19	45.56	0.83	●
25	Estonia	29.10	45.37	0.83	
26	Qatar	28.97	45.09	0.82	
27	Korea, Rep.	28.91	44.96	0.81	
28	Nepal	28.88	44.90	0.81	●
29	Ecuador	28.50	44.07	0.80	●
30	Oman	28.40	43.85	0.79	●
31	Kazakhstan	28.37	43.79	0.78	●
32	Peru	27.76	42.47	0.78	●
33	Senegal	27.42	41.72	0.77	●
34	Namibia	27.31	41.49	0.76	●
35	Kyrgyzstan	27.17	41.19	0.76	●
36	Thailand	26.99	40.79	0.75	
37	Australia	26.91	40.63	0.74	
38	Norway	26.83	40.45	0.73	
39	Malaysia	26.74	40.25	0.73	
40	Georgia	25.95	38.54	0.72	
41	Mali	25.60	37.78	0.71	●
42	Uganda	25.44	37.43	0.71	●
43	Viet Nam	25.22	36.96	0.70	
44	Colombia	24.98	36.44	0.69	
45	Albania	24.92	36.31	0.68	
46	Honduras	24.80	36.04	0.68	●
47	Myanmar	24.72	35.88	0.67	●
48	Ghana	24.58	35.58	0.66	●
49	Lebanon	24.47	35.34	0.65	
50	Rwanda	23.93	34.16	0.65	
51	Canada	23.84	33.97	0.64	
52	Hong Kong (China)	23.75	33.77	0.63	
53	Azerbaijan	23.54	33.32	0.63	
54	Bulgaria	23.49	33.20	0.62	
55	Mauritius	23.19	32.57	0.61	
56	Uruguay	23.06	32.27	0.60	
57	Moldova, Rep.	22.69	31.47	0.60	
58	Latvia	22.53	31.13	0.59	
59	Romania	22.51	31.09	0.58	
60	Czech Republic	22.41	30.87	0.58	
61	Dominican Republic	22.37	30.78	0.57	●
62	Armenia	22.36	30.77	0.56	
63	United Arab Emirates	22.34	30.72	0.55	
64	Chile	22.19	30.39	0.55	
65	Japan	22.15	30.32	0.54	
66	New Zealand	22.13	30.27	0.53	
67	France	22.11	30.22	0.53	○
68	Costa Rica	21.93	29.83	0.52	
69	Mexico	21.86	29.69	0.51	
70	Jordan	21.67	29.27	0.50	
71	Cambodia	21.50	28.90	0.50	●
72	Gambia	21.41	28.70	0.49	●
73	Switzerland	21.15	28.14	0.48	○
74	Austria	20.92	27.65	0.47	○
75	Finland	20.91	27.61	0.47	○
76	Bolivia, Plurinational St.	20.77	27.31	0.46	
77	Togo	20.76	27.30	0.45	●
78	Serbia	20.70	27.16	0.45	
79	Poland	20.62	26.99	0.44	
80	Tunisia	20.56	26.86	0.43	
81	Russian Federation	20.46	26.64	0.42	
82	Belgium	20.27	26.23	0.42	○
83	Cameroon	20.21	26.10	0.41	
84	Slovenia	20.09	25.85	0.40	
85	Turkey	19.87	25.37	0.40	
86	Malawi	19.87	25.37	0.39	
87	Venezuela, Bolivarian Rep.	19.85	25.33	0.38	
88	Bosnia and Herzegovina	19.82	25.26	0.37	
89	United States of America	19.75	25.12	0.37	○
90	Guyana	19.66	24.92	0.36	
91	Burundi	19.65	24.88	0.35	
92	Montenegro	19.62	24.83	0.35	
93	Lithuania	19.60	24.79	0.34	
94	Fiji	19.59	24.76	0.33	
95	Kenya	19.57	24.71	0.32	
96	Israel	19.52	24.61	0.32	○
97	South Africa	19.36	24.26	0.31	
98	Sweden	19.19	23.91	0.30	○
99	Philippines	19.14	23.78	0.29	
100	Croatia	19.12	23.75	0.29	○
101	Nicaragua	18.99	23.46	0.28	
102	Bahrain	18.87	23.21	0.27	
103	Hungary	18.82	23.10	0.27	○
104	Côte d'Ivoire	18.81	23.07	0.26	
105	Luxembourg	18.75	22.95	0.25	○
106	Slovakia	18.58	22.58	0.24	○
107	Jamaica	18.47	22.33	0.24	○
108	Netherlands	18.12	21.57	0.23	○
109	Burkina Faso	18.04	21.41	0.22	
110	Spain	18.01	21.34	0.22	○
111	Argentina	17.96	21.24	0.21	
112	Germany	17.70	20.67	0.20	○
113	Sudan	17.50	20.24	0.19	
114	Italy	17.40	20.02	0.19	○
115	Denmark	17.32	19.84	0.18	○
116	Brazil	17.03	19.22	0.17	○
117	Malta	16.90	18.92	0.17	○
118	Ireland	16.43	17.92	0.16	○
119	Paraguay	15.73	16.40	0.15	
120	Portugal	15.70	16.34	0.14	○
121	Madagascar	15.58	16.07	0.14	
122	United Kingdom	15.05	14.92	0.13	○
123	Nigeria	14.99	14.79	0.12	
124	El Salvador	14.80	14.38	0.12	○
125	Angola	14.76	14.30	0.11	
126	Egypt	14.48	13.68	0.10	○
127	Barbados	14.46	13.64	0.09	○
128	Iceland	14.38	13.48	0.09	○
129	Guatemala	14.26	13.22	0.08	
130	Pakistan	13.99	12.63	0.07	○
131	Trinidad and Tobago	13.99	12.62	0.06	○
132	Kuwait	13.92	12.48	0.06	○
133	Greece	13.80	12.21	0.05	○
134	Zimbabwe	13.70	12.01	0.04	
135	Guinea	12.92	10.31	0.04	
136	Tajikistan	12.64	9.70	0.03	○
137	Swaziland	11.49	7.22	0.02	○
138	Cyprus	9.70	3.33	0.01	○
139	Yemen	8.35	0.41	0.01	○
140	Ukraine	8.16	0.00	0.00	○
n/a	TFYR of Macedonia	n/a	n/a	n/a	

SOURCE: International Monetary Fund, *World Economic Outlook Database*, 2014

NOTE: ● indicates a strength; ○ a weakness

3.3.1 GDP per unit of energy use

GDP per unit of energy use (2005 PPP$ per kg of oil equivalent) | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Hong Kong (China)	21.74	100.00	1.00	●
2	Colombia	15.63	71.33	0.99	●
3	Malta	14.49	66.02	0.98	●
4	Peru	14.29	65.05	0.97	●
4	Sri Lanka	14.29	65.05	0.97	●
6	Mauritius	13.89	63.19	0.96	●
7	Panama	13.51	61.43	0.94	●
7	Singapore	13.51	61.43	0.94	
9	Dominican Republic	13.33	60.59	0.93	●
10	Albania	12.35	55.96	0.91	●
10	Ireland (2013)	12.35	55.96	0.91	
10	Yemen	12.35	55.96	0.91	●
13	Philippines	12.20	55.25	0.90	●
14	Switzerland (2013)	12.05	54.56	0.89	
15	Botswana	11.90	53.89	0.88	●
15	Costa Rica	11.90	53.89	0.88	●
17	Uruguay	11.76	53.23	0.87	●
18	Namibia	11.36	51.35	0.86	●
19	United Kingdom (2013)	11.11	50.17	0.85	
20	Morocco	10.75	48.49	0.84	●
21	Tunisia	10.31	46.41	0.84	●
22	Denmark (2013)	10.31	46.41	0.82	
22	Spain (2013)	10.31	46.41	0.82	
24	Italy (2013)	10.20	45.92	0.81	
25	Portugal (2013)	9.90	44.49	0.80	
26	Bangladesh	9.80	44.04	0.79	●
26	Egypt	9.80	44.04	0.79	●
28	Azerbaijan	9.62	43.16	0.78	●
29	Angola	9.52	42.73	0.75	●
29	Ecuador	9.52	42.73	0.75	●
29	El Salvador	9.52	42.73	0.75	●
29	Israel (2013)	9.52	42.73	0.75	
33	Algeria	9.43	42.30	0.73	●
33	Greece (2013)	9.43	42.30	0.73	
35	Austria (2013)	9.26	41.49	0.72	
36	Cyprus	9.17	41.09	0.70	
36	Germany (2013)	9.17	41.09	0.70	
38	Indonesia	9.09	40.70	0.69	●
38	Turkey (2013)	9.09	40.70	0.69	
40	Lebanon	9.09	40.70	0.68	
41	Brazil	9.01	40.31	0.67	
42	Japan (2013)	8.93	39.93	0.66	
43	Luxembourg (2013)	8.93	39.93	0.66	
44	Mexico (2013)	8.70	38.84	0.65	
45	Croatia	8.62	38.49	0.63	
45	Paraguay	8.62	38.49	0.63	●
47	Guatemala	8.47	37.81	0.62	
48	Jordan	8.40	37.47	0.61	
49	Argentina	8.20	36.50	0.61	
50	Pakistan	8.13	36.19	0.60	●
51	Ghana	8.13	36.19	0.59	●
52	Netherlands (2013)	7.87	34.99	0.58	○
53	France (2013)	7.75	34.42	0.57	
54	Lithuania	7.63	33.86	0.57	
55	Slovenia (2013)	7.58	33.59	0.56	
56	Chile (2013)	7.52	33.32	0.55	
57	Hungary (2013)	7.46	33.06	0.54	
58	Poland (2013)	7.41	32.80	0.53	
59	Norway (2013)	7.30	32.30	0.52	○
59	Tajikistan	7.30	32.30	0.52	●
61	Georgia	7.25	32.05	0.50	
61	Latvia	7.25	32.05	0.50	
63	Kuwait	7.04	31.09	0.48	
63	Sweden (2013)	7.04	31.09	0.48	○
65	Cameroon	7.04	31.09	0.46	●
65	India	7.04	31.09	0.46	
65	Malaysia	7.04	31.09	0.46	
68	United Arab Emirates	6.94	30.63	0.45	
69	Australia (2013)	6.90	30.41	0.44	○
70	Nicaragua	6.85	30.19	0.43	
70	Slovakia (2013)	6.85	30.19	0.43	
72	Romania	6.85	30.19	0.42	
73	Jamaica	6.80	29.97	0.41	
74	Cambodia	6.76	29.75	0.40	
75	Sudan	6.71	29.54	0.39	●
76	TFYR of Macedonia	6.62	29.12	0.38	
76	United States of America (2013)	6.62	29.12	0.38	○
78	Qatar	6.54	28.72	0.37	
79	Armenia	6.49	28.52	0.36	
80	Belgium (2013)	6.49	28.52	0.35	○
81	Senegal	6.45	28.32	0.34	
82	New Zealand (2013)	6.41	28.13	0.33	○
82	Saudi Arabia	6.41	28.13	0.33	
84	Thailand	6.41	28.13	0.32	
85	Montenegro	6.21	27.19	0.31	○
86	Bolivia, Plurinational St.	6.21	27.19	0.30	
87	Honduras	6.17	27.01	0.30	
88	Venezuela, Bolivarian Rep.	6.17	27.01	0.29	
89	Nigeria	6.13	26.84	0.28	
90	Myanmar	6.13	26.84	0.27	●
91	Czech Republic (2013)	5.99	26.15	0.25	○
91	Viet Nam	5.99	26.15	0.25	
93	Korea, Rep. (2013)	5.49	23.83	0.25	○
94	Canada (2013)	5.24	22.62	0.22	○
94	Finland (2013)	5.24	22.62	0.22	○
94	Mongolia	5.24	22.62	0.22	
97	Nepal	5.15	22.24	0.21	
98	Oman	5.00	21.51	0.20	
99	Bulgaria	4.85	20.83	0.20	○
100	Serbia	4.83	20.72	0.19	○
101	Iran, Islamic Rep.	4.81	20.61	0.18	
102	Belarus	4.67	19.98	0.17	○
103	China	4.48	19.10	0.16	○
104	Estonia (2013)	4.33	18.37	0.16	○
105	Kazakhstan	4.29	18.19	0.15	○
106	Bosnia and Herzegovina	4.24	17.94	0.14	○
107	Zambia	4.13	17.45	0.13	
108	Moldova, Rep.	4.02	16.90	0.12	○
109	South Africa	3.98	16.75	0.11	○
110	Kenya	3.95	16.60	0.11	○
111	Côte d'Ivoire	3.85	16.10	0.10	○
112	Bahrain	3.79	15.83	0.09	○
113	Kyrgyzstan	3.45	14.24	0.08	
114	Tanzania, United Rep.	3.09	12.54	0.07	
115	Russian Federation	2.88	11.58	0.07	○
116	Ukraine	2.76	11.02	0.06	○
117	Uzbekistan	2.58	10.19	0.05	○
118	Togo	2.44	9.51	0.04	○
119	Ethiopia	2.19	8.33	0.03	○
120	Mozambique	2.09	7.88	0.02	○
121	Iceland (2013)	2.07	7.80	0.02	○
122	Trinidad and Tobago	1.81	6.53	0.01	○
123	Zimbabwe	0.41	0.00	0.00	○
n/a	Barbados	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	

SOURCE: International Energy Agency (IEA) Statistics© OECD/IEA, 2014

NOTE: ● indicates a strength; ○ a weakness

3.3.2 Environmental performance

Environmental Performance Index | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Switzerland	87.67	87.67	1.00	●
2	Luxembourg	83.29	83.29	0.99	●
3	Australia	82.40	82.40	0.99	●
4	Singapore	81.78	81.78	0.98	●
5	Czech Republic	81.47	81.47	0.97	●
6	Germany	80.47	80.47	0.96	●
7	Spain	79.79	79.79	0.96	●
8	Austria	78.32	78.32	0.95	●
9	Sweden	78.09	78.09	0.94	
10	Norway	78.04	78.04	0.93	
11	Netherlands	77.75	77.75	0.93	
12	United Kingdom	77.35	77.35	0.92	
13	Denmark	76.92	76.92	0.91	
14	Iceland	76.50	76.50	0.91	
15	Slovenia	76.43	76.43	0.90	
16	New Zealand	76.41	76.41	0.89	
17	Portugal	75.80	75.80	0.88	●
18	Finland	75.72	75.72	0.88	
19	Ireland	74.67	74.67	0.87	
20	Estonia	74.66	74.66	0.86	
21	Slovakia	74.45	74.45	0.86	●
22	Italy	74.36	74.36	0.85	●
23	Greece	73.28	73.28	0.84	●
24	Canada	73.14	73.14	0.83	
25	United Arab Emirates	72.91	72.91	0.83	
26	Japan	72.35	72.35	0.82	
27	France	71.05	71.05	0.81	
28	Hungary	70.28	70.28	0.80	
29	Chile	69.93	69.93	0.80	
30	Poland	69.53	69.53	0.79	
31	Serbia	69.13	69.13	0.78	
32	Belarus	67.69	67.69	0.78	
33	United States of America	67.52	67.52	0.77	
34	Malta	67.42	67.42	0.76	
35	Saudi Arabia	66.66	66.66	0.75	
36	Belgium	66.61	66.61	0.75	
37	Cyprus	66.23	66.23	0.74	
38	Israel	65.78	65.78	0.73	
39	Latvia	64.05	64.05	0.72	
40	Bulgaria	64.01	64.01	0.72	
41	Kuwait	63.94	63.94	0.71	●
42	Korea, Rep.	63.79	63.79	0.70	
43	Qatar	63.03	63.03	0.70	
44	Croatia	62.23	62.23	0.69	
45	Armenia	61.67	61.67	0.68	
46	Lithuania	61.26	61.26	0.67	
47	Egypt	61.11	61.11	0.67	●
48	Malaysia	59.31	59.31	0.66	
49	Tunisia	58.99	58.99	0.65	
50	Ecuador	58.54	58.54	0.64	●
51	Costa Rica	58.53	58.53	0.64	
52	Jamaica	58.26	58.26	0.63	●
53	Mauritius	58.09	58.09	0.62	
54	Panama	56.84	56.84	0.62	
55	Jordan	55.78	55.78	0.61	
56	Seychelles	55.56	55.56	0.60	
57	Montenegro	55.52	55.52	0.59	
58	Azerbaijan	55.47	55.47	0.59	
59	Mexico	55.03	55.03	0.58	
60	Turkey	54.91	54.91	0.57	
61	Albania	54.73	54.73	0.57	
62	Sri Lanka	53.88	53.88	0.56	
63	Uruguay	53.61	53.61	0.55	
64	South Africa	53.51	53.51	0.54	
65	Russian Federation	53.45	53.45	0.54	
66	Moldova, Rep.	53.36	53.36	0.53	
67	Dominican Republic	53.24	53.24	0.52	
68	Fiji	53.08	53.08	0.51	
69	Brazil	52.97	52.97	0.51	
70	Thailand	52.83	52.83	0.50	
71	Trinidad and Tobago	52.28	52.28	0.49	
72	Morocco	51.89	51.89	0.49	
73	Bahrain	51.83	51.83	0.48	
74	Iran, Islamic Rep.	51.08	51.08	0.47	
75	Kazakhstan	51.07	51.07	0.46	
76	Colombia	50.77	50.77	0.46	
77	Romania	50.52	50.52	0.45	
78	Bolivia, Plurinational St.	50.48	50.48	0.44	
79	TFYR of Macedonia	50.41	50.41	0.43	
80	Nicaragua	50.32	50.32	0.43	
81	Lebanon	50.15	50.15	0.42	
82	Algeria	50.08	50.08	0.41	
83	Argentina	49.55	49.55	0.41	
84	Zimbabwe	49.54	49.54	0.40	
85	Ukraine	49.01	49.01	0.39	
86	Honduras	48.87	48.87	0.38	
87	Guatemala	48.06	48.06	0.38	
88	Oman	47.75	47.75	0.37	
89	Botswana	47.60	47.60	0.36	
90	Georgia	47.23	47.23	0.36	
91	Bhutan	46.86	46.86	0.35	
92	Bosnia and Herzegovina	45.79	45.79	0.34	
93	Barbados	45.50	45.50	0.33	
94	Peru	45.05	45.05	0.33	
95	Mongolia	44.67	44.67	0.32	
96	Indonesia	44.36	44.36	0.31	
97	Cabo Verde	44.07	44.07	0.30	
98	Philippines	44.02	44.02	0.30	
99	El Salvador	43.79	43.79	0.29	
100	Namibia	43.71	43.71	0.28	
101	Uzbekistan	43.23	43.23	0.28	
102	China	43.00	43.00	0.27	
103	Zambia	41.72	41.72	0.26	
104	Senegal	40.83	40.83	0.25	
105	Kyrgyzstan	40.63	40.63	0.25	
106	Burkina Faso	40.52	40.52	0.24	
107	Malawi	40.06	40.06	0.23	
108	Côte d'Ivoire	39.72	39.72	0.22	
109	Ethiopia	39.43	39.43	0.22	
110	Paraguay	39.25	39.25	0.21	
111	Nigeria	39.20	39.20	0.20	
112	Uganda	39.18	39.18	0.20	
113	Viet Nam	38.17	38.17	0.19	○
114	Guyana	38.07	38.07	0.18	
115	Swaziland	37.35	37.35	0.17	
116	Nepal	37.00	37.00	0.17	
117	Kenya	36.99	36.99	0.16	
118	Cameroon	36.68	36.68	0.15	
119	Niger	36.28	36.28	0.14	
120	Tanzania, United Rep.	36.19	36.19	0.14	
121	Cambodia	35.44	35.44	0.13	
122	Rwanda	35.41	35.41	0.12	
123	Pakistan	34.58	34.58	0.12	
124	Ghana	32.07	32.07	0.11	
125	Tajikistan	31.34	31.34	0.10	
126	India	31.23	31.23	0.09	○
127	Yemen	30.16	30.16	0.09	
128	Mozambique	29.97	29.97	0.08	
129	Gambia	29.30	29.30	0.07	
130	Angola	28.69	28.69	0.07	
131	Guinea	28.03	28.03	0.06	
132	Togo	27.91	27.91	0.05	○
133	Myanmar	27.44	27.44	0.04	
134	Madagascar	26.70	26.70	0.04	○
135	Burundi	25.78	25.78	0.03	○
136	Bangladesh	25.61	25.61	0.02	○
137	Sudan	24.64	24.64	0.01	○
138	Lesotho	20.81	20.81	0.01	○
139	Mali	18.43	18.43	0.00	○
n/a	Hong Kong (China)	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	

SOURCE: Yale University and Columbia University *Environmental Performance Index 2014*

NOTE: ● indicates a strength; ○ a weakness

3.3.3 ISO 14001 environmental certificates

ISO 14001 Environmental management systems—Requirements with guidance for use: Number of certificates issued (per billion PPP$ GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Czech Republic	15.77	100.00	0.99	●
1	Estonia	12.79	100.00	0.99	●
1	Romania	23.24	100.00	0.99	●
4	Italy	11.71	91.54	0.98	●
5	Bulgaria	11.01	86.09	0.97	●
6	Spain	10.54	82.40	0.96	●
7	Slovakia	9.84	76.89	0.96	●
8	Croatia	9.46	73.91	0.95	●
9	Sweden	8.53	66.68	0.94	
10	Lithuania	8.51	66.53	0.93	●
11	Hungary	8.34	65.22	0.93	●
12	Slovenia	7.97	62.32	0.92	●
13	Serbia	7.95	62.14	0.91	●
14	United Kingdom	6.89	53.86	0.91	
15	Switzerland	6.55	51.20	0.90	
16	Finland	6.52	50.96	0.89	
17	China	6.48	50.62	0.88	
18	Latvia	6.38	49.87	0.88	●
19	Japan	5.06	39.58	0.87	
20	TFYR of Macedonia	4.99	39.03	0.86	●
21	Portugal	4.84	37.85	0.85	
22	Tajikistan	4.66	36.40	0.85	●
23	Colombia	4.62	36.09	0.84	●
24	Singapore	4.30	33.61	0.83	
25	Bosnia and Herzegovina	3.79	29.61	0.82	●
26	Greece	3.69	28.82	0.82	
27	Denmark	3.33	26.06	0.81	
28	Ireland	3.27	25.58	0.80	
29	Thailand	3.27	25.53	0.80	
30	Malaysia	3.24	25.29	0.79	
31	Australia	3.18	24.83	0.78	
32	Norway	3.15	24.59	0.77	
33	France	3.13	24.49	0.77	
34	Netherlands	3.10	24.23	0.76	
35	Israel	2.87	22.46	0.75	
36	Korea, Rep.	2.78	21.74	0.74	
37	Iceland	2.76	21.58	0.74	
38	Austria	2.75	21.51	0.73	
39	Montenegro	2.63	20.57	0.72	
40	Malta	2.60	20.34	0.72	
41	Chile	2.49	19.47	0.71	
42	Belgium	2.45	19.19	0.70	
43	Poland	2.44	19.05	0.69	
44	Germany	2.21	17.28	0.69	
45	Cyprus	2.06	16.12	0.68	
46	Uruguay	1.98	15.46	0.67	
47	United Arab Emirates	1.96	15.33	0.66	
48	Viet Nam	1.90	14.86	0.66	
49	New Zealand	1.84	14.38	0.65	
50	Luxembourg	1.81	14.13	0.64	
51	Hong Kong (China)	1.80	14.04	0.64	
52	Tunisia	1.65	12.93	0.63	
53	Argentina	1.41	11.00	0.62	
54	South Africa	1.31	10.22	0.61	
55	Seychelles	1.30	10.18	0.61	
56	Zimbabwe	1.23	9.65	0.60	●
57	Turkey	1.20	9.38	0.59	
58	Costa Rica	1.18	9.25	0.58	
59	Ecuador	1.17	9.17	0.58	
60	Canada	1.16	9.07	0.57	
61	Brazil	1.15	8.99	0.56	
62	Barbados	1.12	8.75	0.55	
63	Albania	1.12	8.72	0.55	
64	Bahrain	1.12	8.72	0.54	
65	Peru	0.96	7.52	0.53	
66	Philippines	0.95	7.43	0.53	
67	Sri Lanka	0.93	7.25	0.52	
68	Bhutan	0.92	7.20	0.51	
69	Egypt	0.92	7.16	0.50	
70	India	0.87	6.77	0.50	
71	Bolivia, Plurinational St.	0.81	6.33	0.49	
72	Qatar	0.78	6.09	0.48	
73	Swaziland	0.72	5.61	0.47	●
74	Mauritius	0.63	4.91	0.47	
75	Indonesia	0.62	4.85	0.46	
76	Fiji	0.58	4.53	0.45	
77	Mozambique	0.56	4.38	0.45	
78	Iran, Islamic Rep.	0.55	4.29	0.44	
79	Mexico	0.52	4.05	0.43	
80	Jordan	0.51	4.01	0.42	
81	Oman	0.51	3.97	0.42	
82	Ukraine	0.50	3.91	0.41	
83	Namibia	0.50	3.90	0.40	
84	Moldova, Rep.	0.48	3.75	0.39	
85	Malawi	0.47	3.66	0.39	
86	Jamaica	0.47	3.64	0.38	
87	Lebanon	0.43	3.39	0.37	
88	Belarus	0.41	3.23	0.36	
89	Kenya	0.41	3.22	0.36	
90	Azerbaijan	0.41	3.21	0.35	
91	Kazakhstan	0.38	2.98	0.34	
92	Morocco	0.38	2.98	0.34	
93	Honduras	0.37	2.93	0.33	
94	Zambia	0.37	2.88	0.32	
95	Russian Federation	0.36	2.85	0.31	
96	United States of America	0.36	2.83	0.31	○
97	Nicaragua	0.36	2.81	0.30	
98	Kuwait	0.34	2.63	0.29	
99	Pakistan	0.33	2.57	0.28	
100	Cabo Verde	0.31	2.44	0.28	
101	Tanzania, United Rep.	0.31	2.41	0.27	
102	Senegal	0.28	2.22	0.26	
103	Botswana	0.28	2.22	0.26	
104	Trinidad and Tobago	0.28	2.22	0.25	
105	Panama	0.27	2.09	0.24	
106	El Salvador	0.26	2.06	0.23	
107	Uganda	0.26	2.05	0.23	
108	Paraguay	0.25	1.99	0.22	
109	Dominican Republic	0.25	1.97	0.21	
110	Georgia	0.25	1.94	0.20	
111	Niger	0.24	1.89	0.20	
112	Côte d'Ivoire	0.21	1.68	0.19	
113	Togo	0.21	1.64	0.18	
114	Guinea	0.20	1.60	0.18	
115	Algeria	0.19	1.51	0.17	
116	Saudi Arabia	0.19	1.47	0.16	○
117	Ghana	0.18	1.37	0.15	
118	Cameroon	0.17	1.36	0.15	
119	Cambodia	0.17	1.36	0.14	
120	Armenia	0.17	1.35	0.13	○
121	Venezuela, Bolivarian Rep.	0.15	1.20	0.12	
122	Guatemala	0.13	1.04	0.12	
123	Nepal	0.13	1.00	0.11	
124	Rwanda	0.12	0.90	0.10	
125	Bangladesh	0.11	0.90	0.09	
126	Burkina Faso	0.11	0.84	0.09	
127	Mongolia	0.09	0.74	0.08	○
128	Sudan	0.09	0.72	0.07	
129	Uzbekistan	0.09	0.70	0.07	○
130	Madagascar	0.06	0.48	0.06	
131	Angola	0.06	0.47	0.05	
132	Kyrgyzstan	0.05	0.43	0.04	○
133	Nigeria	0.05	0.39	0.04	○
134	Mali	0.04	0.31	0.03	○
135	Ethiopia	0.04	0.30	0.02	○
136	Myanmar	0.03	0.25	0.01	
137	Yemen	0.01	0.08	0.01	○
138	Guyana	0.00	0.00	0.00	○
n/a	Burundi	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	

SOURCE: International Organization for Standardization, *The ISO Survey of Certifications 2013*; International Monetary Fund World Economic Outlook 2015 (PPP$ GDP)

NOTE: ● indicates a strength; ○ a weakness

4.1.1 Ease of getting credit

Ease of getting credit (distance to frontier) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank		Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	New Zealand	100.00	100.00	1.00	●	65	Greece	50.00	50.00	0.44	
2	Colombia	95.00	95.00	0.99	●	65	Indonesia	50.00	50.00	0.44	
2	United States of America	95.00	95.00	0.99	●	65	Japan	50.00	50.00	0.44	
4	Australia	90.00	90.00	0.96	●	65	Kazakhstan	50.00	50.00	0.44	
4	Montenegro	90.00	90.00	0.96	●	65	Netherlands	50.00	50.00	0.44	○
4	Rwanda	90.00	90.00	0.96	●	65	Paraguay	50.00	50.00	0.44	
7	Canada	85.00	85.00	0.94		65	Saudi Arabia	50.00	50.00	0.44	
7	Georgia	85.00	85.00	0.94	●	80	Belgium	45.00	45.00	0.35	○
7	Honduras	85.00	85.00	0.94	●	80	Brazil	45.00	45.00	0.35	
7	Romania	85.00	85.00	0.94	●	80	Costa Rica	45.00	45.00	0.35	
11	Cambodia	80.00	80.00	0.90	●	80	Dominican Republic	45.00	45.00	0.35	
11	Guatemala	80.00	80.00	0.90	●	80	Ecuador	45.00	45.00	0.35	
11	Jamaica	80.00	80.00	0.90	●	80	Iran, Islamic Rep.	45.00	45.00	0.35	
11	Mexico	80.00	80.00	0.90	●	80	Italy	45.00	45.00	0.35	○
11	Peru	80.00	80.00	0.90	●	80	Nicaragua	45.00	45.00	0.35	
16	Hungary	75.00	75.00	0.86	●	80	Portugal	45.00	45.00	0.35	○
16	Panama	75.00	75.00	0.86	●	80	Sri Lanka	45.00	45.00	0.35	
16	Poland	75.00	75.00	0.86	●	80	Thailand	45.00	45.00	0.35	
16	Singapore	75.00	75.00	0.86		80	Turkey	45.00	45.00	0.35	
16	Ukraine	75.00	75.00	0.86	●	80	United Arab Emirates	45.00	45.00	0.35	
16	United Kingdom	75.00	75.00	0.86		93	Azerbaijan	40.00	40.00	0.29	
22	Bulgaria	70.00	70.00	0.77		93	Bahrain	40.00	40.00	0.29	
22	Czech Republic	70.00	70.00	0.77		93	Belarus	40.00	40.00	0.29	
22	Denmark	70.00	70.00	0.77		93	Cabo Verde	40.00	40.00	0.29	
22	Estonia	70.00	70.00	0.77		93	Morocco	40.00	40.00	0.29	
22	Germany	70.00	70.00	0.77		93	Philippines	40.00	40.00	0.29	
22	Hong Kong (China)	70.00	70.00	0.77		93	Uzbekistan	40.00	40.00	0.29	
22	Ireland	70.00	70.00	0.77		93	Venezuela, Bolivarian Rep.	40.00	40.00	0.29	
22	Latvia	70.00	70.00	0.77		93	Zimbabwe	40.00	40.00	0.29	
22	Lithuania	70.00	70.00	0.77		102	Barbados	35.00	35.00	0.21	○
22	Malaysia	70.00	70.00	0.77		102	Bolivia, Plurinational St.	35.00	35.00	0.21	
22	Moldova, Rep.	70.00	70.00	0.77		102	Cameroon	35.00	35.00	0.21	
22	Zambia	70.00	70.00	0.77	●	102	Kenya	35.00	35.00	0.21	
34	Albania	65.00	65.00	0.67		102	Kuwait	35.00	35.00	0.21	
34	Armenia	65.00	65.00	0.67		102	Lebanon	35.00	35.00	0.21	
34	Bosnia and Herzegovina	65.00	65.00	0.67		102	Nepal	35.00	35.00	0.21	
34	Finland	65.00	65.00	0.67		102	Oman	35.00	35.00	0.21	
34	Ghana	65.00	65.00	0.67	●	102	Slovenia	35.00	35.00	0.21	○
34	India	65.00	65.00	0.67		102	Tajikistan	35.00	35.00	0.21	
34	Israel	65.00	65.00	0.67		102	Tunisia	35.00	35.00	0.21	
34	Korea, Rep.	65.00	65.00	0.67		113	Bangladesh	30.00	30.00	0.12	
34	Kyrgyzstan	65.00	65.00	0.67	●	113	Burkina Faso	30.00	30.00	0.12	
34	Mauritius	65.00	65.00	0.67		113	Côte d'Ivoire	30.00	30.00	0.12	
34	Slovakia	65.00	65.00	0.67		113	Guinea	30.00	30.00	0.12	
34	TFYR of Macedonia	65.00	65.00	0.67		113	Mali	30.00	30.00	0.12	
34	Trinidad and Tobago	65.00	65.00	0.67	●	113	Mozambique	30.00	30.00	0.12	
34	Viet Nam	65.00	65.00	0.67		113	Niger	30.00	30.00	0.12	
48	Austria	60.00	60.00	0.61		113	Pakistan	30.00	30.00	0.12	
48	Iceland	60.00	60.00	0.61		113	Qatar	30.00	30.00	0.12	○
48	Nigeria	60.00	60.00	0.61	●	113	Senegal	30.00	30.00	0.12	
48	Serbia	60.00	60.00	0.61		113	Togo	30.00	30.00	0.12	
48	South Africa	60.00	60.00	0.61		113	Uganda	30.00	30.00	0.12	
48	Spain	60.00	60.00	0.61		125	Lesotho	25.00	25.00	0.10	
48	Switzerland	60.00	60.00	0.61	○	125	Malawi	25.00	25.00	0.10	○
48	Uruguay	60.00	60.00	0.61		125	Tanzania, United Rep.	25.00	25.00	0.10	
56	Botswana	55.00	55.00	0.55		128	Gambia	20.00	20.00	0.09	
56	Croatia	55.00	55.00	0.55		129	Ethiopia	15.00	15.00	0.06	
56	Cyprus	55.00	55.00	0.55		129	Guyana	15.00	15.00	0.06	○
56	Mongolia	55.00	55.00	0.55		129	Luxembourg	15.00	15.00	0.06	○
56	Namibia	55.00	55.00	0.55		129	Sudan	15.00	15.00	0.06	
56	Norway	55.00	55.00	0.55		133	Algeria	10.00	10.00	0.03	○
56	Russian Federation	55.00	55.00	0.55		133	Burundi	10.00	10.00	0.03	○
56	Swaziland	55.00	55.00	0.55	●	133	Malta	10.00	10.00	0.03	○
56	Sweden	55.00	55.00	0.55	○	133	Myanmar	10.00	10.00	0.03	
65	Argentina	50.00	50.00	0.44		133	Seychelles	10.00	10.00	0.03	○
65	Bhutan	50.00	50.00	0.44		138	Angola	5.00	5.00	0.01	○
65	Chile	50.00	50.00	0.44		138	Madagascar	5.00	5.00	0.01	○
65	China	50.00	50.00	0.44		140	Jordan	0.00	0.00	0.00	○
65	Egypt	50.00	50.00	0.44		140	Yemen	0.00	0.00	0.00	○
65	El Salvador	50.00	50.00	0.44							
65	Fiji	50.00	50.00	0.44							
65	France	50.00	50.00	0.44	○						

SOURCE: World Bank. *Doing Business 2015: Going Beyond Efficiency*

NOTE: ● indicates a strength; ○ a weakness

4.1.2 Domestic credit to private sector

Domestic credit to private sector (% of GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Cyprus	300.60	100.00	1.00	●
2	Hong Kong (China)	219.49	72.59	0.99	●
3	Denmark	199.60	65.86	0.99	●
4	United States of America	192.31	63.40	0.98	●
5	Japan	188.34	62.06	0.97	●
6	Netherlands	177.99	58.56	0.96	●
7	Spain	171.97	56.52	0.96	●
8	Portugal	169.78	55.78	0.95	●
9	Switzerland	169.04	55.53	0.94	
10	Ireland	168.03	55.19	0.93	
11	Luxembourg	162.42	53.30	0.93	
12	South Africa	156.05	51.14	0.92	●
13	United Kingdom	155.49	50.95	0.91	
14	Thailand	154.41	50.59	0.91	●
15	New Zealand (2010)	145.42	47.55	0.90	
16	China	140.01	45.72	0.89	
17	Sweden	135.34	44.14	0.88	
18	Korea, Rep.	135.02	44.03	0.88	
19	Singapore	128.94	41.98	0.87	
20	Australia	125.80	40.92	0.86	
21	Canada (2008)	124.93	40.62	0.86	
22	Malaysia	123.99	40.31	0.85	
23	Greece	122.59	39.83	0.84	●
24	Malta	119.32	38.73	0.83	
25	Italy	117.03	37.95	0.83	
26	Austria	112.07	36.28	0.82	
27	France	111.35	36.03	0.81	
28	Mauritius	108.10	34.93	0.80	
29	Chile	105.89	34.19	0.80	
30	Lebanon	98.64	31.74	0.79	●
31	Finland	98.14	31.57	0.78	
32	Viet Nam	96.80	31.12	0.78	●
33	Germany	93.13	29.88	0.77	
34	Iceland	91.51	29.33	0.76	
35	Israel (2011)	89.46	28.64	0.75	
36	Belgium	89.39	28.61	0.75	
37	Norway (2006)	86.19	27.53	0.74	
38	Fiji	81.40	25.91	0.73	●
39	Barbados (2009)	80.57	25.63	0.72	
40	Croatia	76.72	24.33	0.72	
41	Tunisia	75.74	24.00	0.71	●
42	Ukraine	73.96	23.40	0.70	
43	Estonia	73.70	23.31	0.70	
44	Jordan	72.33	22.85	0.69	
45	Slovenia	70.79	22.32	0.68	
46	Panama	70.72	22.30	0.67	
47	Brazil	70.68	22.29	0.67	
48	Turkey	70.19	22.12	0.66	
49	Morocco	70.17	22.11	0.65	
50	Bulgaria	69.64	21.94	0.64	
51	Bahrain	69.10	21.75	0.64	
52	Mongolia	67.28	21.14	0.63	
53	Cabo Verde	63.24	19.77	0.62	●
54	Bosnia and Herzegovina	62.01	19.36	0.62	
55	Latvia	60.70	18.92	0.61	
56	United Arab Emirates (2012)	59.07	18.36	0.60	
57	Nepal	58.11	18.04	0.59	●
58	Kuwait (2012)	55.76	17.24	0.59	
59	Czech Republic	55.36	17.11	0.58	
60	Honduras	55.23	17.06	0.57	
61	Poland	53.93	16.63	0.57	
62	Montenegro	53.61	16.52	0.56	
63	Russian Federation	52.51	16.15	0.55	
64	India	51.82	15.91	0.54	
65	Hungary	50.76	15.55	0.54	
66	Costa Rica	50.44	15.44	0.53	
67	Colombia	50.23	15.38	0.52	
68	TFYR of Macedonia	49.20	15.03	0.51	
69	Namibia	46.98	14.28	0.51	
70	Bolivia, Plurinational St.	46.96	14.27	0.50	
71	Lithuania	46.22	14.02	0.49	
72	Bhutan	46.08	13.97	0.49	
73	Paraguay	45.80	13.88	0.48	
74	Cambodia	45.34	13.72	0.47	
75	Armenia	45.18	13.67	0.46	
76	Slovakia (2008)	44.12	13.31	0.46	
77	Serbia	43.57	13.12	0.45	
78	Guyana	43.33	13.04	0.44	
79	El Salvador	42.69	12.83	0.43	
80	Oman	42.21	12.66	0.43	
81	Bangladesh	41.79	12.52	0.42	
82	Romania	41.42	12.40	0.41	
83	Saudi Arabia	40.29	12.02	0.41	
84	Georgia	39.85	11.87	0.40	
85	Moldova, Rep.	39.74	11.83	0.39	
86	Qatar	39.27	11.67	0.38	
87	Indonesia	37.89	11.21	0.38	
88	Albania	37.58	11.10	0.37	
89	Philippines	35.83	10.51	0.36	
90	Kazakhstan	35.58	10.42	0.36	
91	Senegal	33.04	9.56	0.35	
92	Guatemala	32.64	9.43	0.34	
93	Togo	32.22	9.29	0.33	
94	Botswana	32.05	9.23	0.33	
95	Kenya	31.63	9.09	0.32	
96	Peru	31.39	9.01	0.31	
97	Trinidad and Tobago	31.13	8.92	0.30	
98	Sri Lanka (2012)	31.09	8.91	0.30	
99	Mexico	30.60	8.74	0.29	
100	Jamaica	29.61	8.41	0.28	
101	Mozambique	28.90	8.17	0.28	
102	Nicaragua	28.81	8.14	0.27	
103	Egypt	27.82	7.80	0.26	
104	Uruguay	26.84	7.47	0.25	
105	Ecuador	26.72	7.43	0.25	
106	Burkina Faso	26.06	7.21	0.24	
107	Azerbaijan	25.46	7.00	0.23	
108	Venezuela, Bolivarian Rep.	25.33	6.96	0.22	
109	Swaziland	25.27	6.94	0.22	
110	Belarus	24.15	6.56	0.21	○
111	Dominican Republic	24.02	6.52	0.20	
112	Angola	23.53	6.35	0.20	
113	Mali	22.79	6.10	0.19	
114	Seychelles	21.85	5.78	0.18	○
115	Lesotho	20.20	5.23	0.17	
116	Malawi	18.55	4.67	0.17	
117	Côte d'Ivoire	18.43	4.63	0.16	
118	Burundi	18.01	4.48	0.15	
119	Tajikistan	17.86	4.43	0.14	
120	Ethiopia (2008)	17.71	4.38	0.14	
121	Tanzania, United Rep.	17.21	4.21	0.13	
122	Ghana	16.99	4.14	0.12	
123	Algeria	16.69	4.04	0.12	
124	Zambia	16.54	3.99	0.11	
125	Pakistan	16.04	3.82	0.10	
126	Argentina	15.77	3.73	0.09	○
127	Uganda	15.52	3.64	0.09	
128	Gambia	15.41	3.60	0.08	
129	Kyrgyzstan (2007)	15.05	3.49	0.07	○
130	Cameroon	14.78	3.39	0.07	○
131	Niger	14.20	3.20	0.06	
132	Nigeria	12.59	2.65	0.05	
133	Iran, Islamic Rep.	12.24	2.54	0.04	○
134	Madagascar	11.92	2.43	0.04	○
135	Rwanda (2005)	11.21	2.19	0.03	○
136	Sudan	10.45	1.93	0.02	○
137	Guinea (2011)	9.13	1.48	0.01	○
138	Yemen	6.34	0.54	0.01	○
139	Myanmar (2004)	4.74	0.00	0.00	○
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: International Monetary Fund (with World Bank and OECD GDP estimates), extracted from World Bank *World Development Indicators* database

NOTE: ● indicates a strength; ○ a weakness

4.1.3 Microfinance institutions' gross loan portfolio

Microfinance institutions: Gross loan portfolio (% of GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Armenia	8.36	100.00	0.97	●
1	Bolivia, Plurinational St.	14.72	100.00	0.97	●
1	Cambodia	17.31	100.00	0.97	●
1	Mongolia	18.91	100.00	0.97	●
5	Bhutan (2012)	6.10	72.97	0.96	●
6	Rwanda	5.77	68.96	0.94	●
7	Georgia	5.15	61.64	0.93	●
8	Tajikistan	5.01	59.92	0.92	●
9	Peru	4.96	59.34	0.91	●
10	Kyrgyzstan	4.77	57.02	0.90	●
11	Paraguay	4.72	56.41	0.89	●
12	Kenya	4.69	56.10	0.88	●
13	Togo	4.20	50.24	0.87	●
14	Ecuador	4.04	48.31	0.85	●
15	Tanzania, United Rep.	3.84	45.88	0.84	●
16	Viet Nam	3.45	41.21	0.83	●
17	TFYR of Macedonia	3.12	37.28	0.82	●
18	Azerbaijan	2.79	33.43	0.81	●
19	Nicaragua	2.78	33.26	0.80	●
20	Malawi	2.74	32.72	0.79	●
21	Senegal	2.73	32.66	0.78	●
22	Albania	2.62	31.35	0.76	●
23	Moldova, Rep.	2.34	28.00	0.75	
24	Bangladesh	2.21	26.43	0.74	●
25	Burundi	2.13	25.46	0.73	●
26	Honduras	2.09	25.01	0.72	●
27	Colombia	2.01	24.05	0.71	
28	Bosnia and Herzegovina	1.83	21.85	0.70	
29	Uganda	1.79	21.40	0.69	●
30	Serbia	1.68	20.08	0.67	
31	Swaziland (2012)	1.63	19.53	0.66	●
32	El Salvador	1.52	18.16	0.65	●
33	Burkina Faso	1.39	16.59	0.64	●
34	Bulgaria	1.38	16.49	0.63	
35	Cameroon	1.18	14.17	0.62	●
36	Dominican Republic	1.17	14.01	0.61	●
37	Sri Lanka (2012)	1.06	12.72	0.60	
38	Madagascar	1.02	12.23	0.58	●
39	Uzbekistan (2012)	0.87	10.40	0.57	●
40	Nepal (2012)	0.80	9.55	0.56	●
41	Mali	0.71	8.43	0.55	
42	Montenegro	0.69	8.25	0.54	
43	Chile	0.66	7.95	0.53	
44	Morocco	0.55	6.53	0.52	
45	Niger	0.42	5.06	0.51	●
46	Guyana (2012)	0.39	4.60	0.49	
47	Panama	0.39	4.60	0.48	
48	Jordan	0.35	4.22	0.47	
49	Guatemala	0.35	4.20	0.46	
50	India	0.29	3.48	0.45	
51	Guinea (2012)	0.25	2.95	0.44	●
52	Gambia (2012)	0.24	2.89	0.43	●
53	Mozambique	0.24	2.84	0.42	
54	Romania	0.24	2.81	0.40	
55	Ghana	0.22	2.64	0.39	
56	Tunisia	0.22	2.62	0.38	
57	Kazakhstan	0.20	2.37	0.37	
58	Philippines	0.20	2.35	0.36	
59	Côte d'Ivoire	0.19	2.28	0.35	
60	Jamaica	0.15	1.83	0.34	
61	Pakistan	0.15	1.78	0.33	
62	Costa Rica	0.15	1.78	0.31	
63	Lebanon	0.14	1.62	0.30	
64	Ukraine	0.13	1.59	0.29	
65	Malaysia (2011)	0.13	1.58	0.28	○
66	Mexico	0.12	1.38	0.27	
67	Poland	0.11	1.35	0.26	○
68	Zimbabwe	0.08	0.99	0.25	
69	Brazil	0.07	0.89	0.24	
70	Sudan	0.07	0.82	0.22	
71	Nigeria	0.07	0.80	0.21	
72	Egypt	0.05	0.64	0.20	
73	Venezuela, Bolivarian Rep. (2011)	0.05	0.58	0.19	
74	Ethiopia	0.04	0.42	0.18	
75	Namibia (2012)	0.03	0.35	0.17	
76	Fiji	0.02	0.29	0.16	○
77	Yemen	0.02	0.29	0.15	
78	Uruguay (2011)	0.02	0.18	0.13	○
79	Angola (2011)	0.01	0.15	0.12	
80	Croatia (2007)	0.01	0.13	0.11	○
81	Russian Federation	0.01	0.11	0.10	○
82	South Africa	0.01	0.08	0.09	○
83	Argentina	0.01	0.07	0.08	○
84	Zambia	0.01	0.07	0.07	○
85	Indonesia	0.01	0.07	0.06	○
86	China	0.00	0.04	0.04	○
87	Turkey	0.00	0.02	0.03	○
88	Trinidad and Tobago	0.00	0.02	0.02	○
89	Hungary (2007)	0.00	0.01	0.01	○
90	Thailand (2011)	0.00	0.00	0.00	○
n/a	Algeria	n/a	n/a	n/a	
n/a	Australia	n/a	n/a	n/a	
n/a	Austria	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Belarus	n/a	n/a	n/a	
n/a	Belgium	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Canada	n/a	n/a	n/a	
n/a	Cyprus	n/a	n/a	n/a	
n/a	Czech Republic	n/a	n/a	n/a	
n/a	Denmark	n/a	n/a	n/a	
n/a	Estonia	n/a	n/a	n/a	
n/a	Finland	n/a	n/a	n/a	
n/a	France	n/a	n/a	n/a	
n/a	Germany	n/a	n/a	n/a	
n/a	Greece	n/a	n/a	n/a	
n/a	Hong Kong (China)	n/a	n/a	n/a	
n/a	Iceland	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Ireland	n/a	n/a	n/a	
n/a	Israel	n/a	n/a	n/a	
n/a	Italy	n/a	n/a	n/a	
n/a	Japan	n/a	n/a	n/a	
n/a	Korea, Rep.	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Latvia	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Lithuania	n/a	n/a	n/a	
n/a	Luxembourg	n/a	n/a	n/a	
n/a	Malta	n/a	n/a	n/a	
n/a	Mauritius	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Netherlands	n/a	n/a	n/a	
n/a	New Zealand	n/a	n/a	n/a	
n/a	Norway	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Portugal	n/a	n/a	n/a	
n/a	Qatar	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Singapore	n/a	n/a	n/a	
n/a	Slovakia	n/a	n/a	n/a	
n/a	Slovenia	n/a	n/a	n/a	
n/a	Spain	n/a	n/a	n/a	
n/a	Sweden	n/a	n/a	n/a	
n/a	Switzerland	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	United Kingdom	n/a	n/a	n/a	
n/a	United States of America	n/a	n/a	n/a	

SOURCE: Microfinance Information Exchange, *Mix Market database*; International Monetary Fund *World Economic Outlook Database*, 2014

NOTE: ● indicates a strength; ○ a weakness

4.2.1 Ease of protecting investors

Ease of protecting investors (distance to frontier) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	New Zealand	81.67	81.67	1.00	●
2	Hong Kong (China)	80.83	80.83	0.99	●
3	Singapore	80.00	80.00	0.99	●
4	United Kingdom	78.33	78.33	0.98	●
5	Malaysia	74.17	74.17	0.97	●
6	Ireland	73.33	73.33	0.96	●
7	Albania	72.50	72.50	0.94	●
7	Canada	72.50	72.50	0.94	
7	India	72.50	72.50	0.94	●
10	Colombia	71.67	71.67	0.94	●
11	Israel	70.83	70.83	0.93	
12	Norway	70.00	70.00	0.92	
13	Turkey	69.17	69.17	0.91	●
14	Bulgaria	68.33	68.33	0.89	●
14	Cyprus	68.33	68.33	0.89	●
14	Slovenia	68.33	68.33	0.89	
17	Denmark	67.50	67.50	0.86	
17	France	67.50	67.50	0.86	
17	Mongolia	67.50	67.50	0.86	●
17	South Africa	67.50	67.50	0.86	●
21	Italy	66.67	66.67	0.84	
21	Korea, Rep.	66.67	66.67	0.84	
21	Pakistan	66.67	66.67	0.84	●
21	TFYR of Macedonia	66.67	66.67	0.84	●
25	Kazakhstan	65.83	65.83	0.81	●
25	Thailand	65.83	65.83	0.81	
25	United States of America	65.83	65.83	0.81	
28	Iceland	65.00	65.00	0.80	
28	Mauritius	65.00	65.00	0.80	
30	Spain	64.17	64.17	0.79	
31	Austria	63.33	63.33	0.77	
31	Serbia	63.33	63.33	0.77	
31	Sweden	63.33	63.33	0.77	
34	Brazil	62.50	62.50	0.74	
34	Japan	62.50	62.50	0.74	
34	Kyrgyzstan	62.50	62.50	0.74	●
34	Poland	62.50	62.50	0.74	
38	Belgium	61.67	61.67	0.72	
38	Peru	61.67	61.67	0.72	●
38	Romania	61.67	61.67	0.72	
41	Bangladesh	60.83	60.83	0.68	●
41	Georgia	60.83	60.83	0.68	
41	Indonesia	60.83	60.83	0.68	
41	Kuwait	60.83	60.83	0.68	●
41	Montenegro	60.83	60.83	0.68	
41	United Arab Emirates	60.83	60.83	0.68	
47	Armenia	60.00	60.00	0.66	
47	Latvia	60.00	60.00	0.66	
49	Azerbaijan	59.17	59.17	0.63	
49	Germany	59.17	59.17	0.63	
49	Malta	59.17	59.17	0.63	
49	Portugal	59.17	59.17	0.63	
49	Sri Lanka	59.17	59.17	0.63	
54	Chile	58.33	58.33	0.59	
54	Estonia	58.33	58.33	0.59	
54	Ghana	58.33	58.33	0.59	●
54	Moldova, Rep.	58.33	58.33	0.59	
54	Seychelles	58.33	58.33	0.59	
54	Tajikistan	58.33	58.33	0.59	●
60	Argentina	57.50	57.50	0.54	
60	Croatia	57.50	57.50	0.54	
60	Greece	57.50	57.50	0.54	
60	Mexico	57.50	57.50	0.54	
60	Nigeria	57.50	57.50	0.54	●
60	Saudi Arabia	57.50	57.50	0.54	
60	Trinidad and Tobago	57.50	57.50	0.54	
67	Australia	56.67	56.67	0.51	
67	Jamaica	56.67	56.67	0.51	
67	Nepal	56.67	56.67	0.51	●
70	Finland	55.83	55.83	0.50	○
70	Panama	55.83	55.83	0.50	
72	Lithuania	55.00	55.00	0.48	
72	Switzerland	55.00	55.00	0.48	○
72	Tunisia	55.00	55.00	0.48	
75	Bosnia and Herzegovina	54.17	54.17	0.45	
75	Czech Republic	54.17	54.17	0.45	
75	Dominican Republic	54.17	54.17	0.45	
75	Zambia	54.17	54.17	0.45	
79	Madagascar	53.33	53.33	0.43	
79	Namibia	53.33	53.33	0.43	
79	Zimbabwe	53.33	53.33	0.43	
82	Cambodia	52.50	52.50	0.42	
83	Angola	51.67	51.67	0.39	●
83	Belarus	51.67	51.67	0.39	
83	Burundi	51.67	51.67	0.39	●
83	Mozambique	51.67	51.67	0.39	
83	Netherlands	51.67	51.67	0.39	○
88	Russian Federation	50.83	50.83	0.36	
88	Slovakia	50.83	50.83	0.36	
88	Uzbekistan	50.83	50.83	0.36	
91	Bahrain	50.00	50.00	0.35	
91	Bhutan	50.00	50.00	0.35	
93	Botswana	49.17	49.17	0.33	
93	Lebanon	49.17	49.17	0.33	
93	Lesotho	49.17	49.17	0.33	
96	Ukraine	48.33	48.33	0.32	
97	Fiji	47.50	47.50	0.29	
97	Hungary	47.50	47.50	0.29	○
97	Swaziland	47.50	47.50	0.29	
97	Uganda	47.50	47.50	0.29	
97	Uruguay	47.50	47.50	0.29	
102	Cameroon	46.67	46.67	0.25	
102	Ecuador	46.67	46.67	0.25	
102	Luxembourg	46.67	46.67	0.25	○
102	Rwanda	46.67	46.67	0.25	
102	Viet Nam	46.67	46.67	0.25	
107	Burkina Faso	45.83	45.83	0.20	
107	Kenya	45.83	45.83	0.20	
107	Morocco	45.83	45.83	0.20	○
107	Oman	45.83	45.83	0.20	
107	Qatar	45.83	45.83	0.20	
107	Senegal	45.83	45.83	0.20	
107	Togo	45.83	45.83	0.20	
114	Algeria	45.00	45.00	0.18	
114	China	45.00	45.00	0.18	○
114	Malawi	45.00	45.00	0.18	
117	Egypt	44.17	44.17	0.16	
117	Guyana	44.17	44.17	0.16	
119	Tanzania, United Rep.	43.33	43.33	0.16	
120	Côte d'Ivoire	42.50	42.50	0.14	
120	Mali	42.50	42.50	0.14	
120	Niger	42.50	42.50	0.14	
123	El Salvador	41.67	41.67	0.10	○
123	Ethiopia	41.67	41.67	0.10	
123	Iran, Islamic Rep.	41.67	41.67	0.10	
123	Jordan	41.67	41.67	0.10	○
123	Philippines	41.67	41.67	0.10	○
128	Bolivia, Plurinational St.	40.83	40.83	0.09	○
129	Gambia	39.17	39.17	0.07	○
129	Guinea	39.17	39.17	0.07	
129	Yemen	39.17	39.17	0.07	
132	Paraguay	38.33	38.33	0.06	○
133	Cabo Verde	35.00	35.00	0.06	○
134	Nicaragua	33.33	33.33	0.05	○
135	Guatemala	31.67	31.67	0.03	○
135	Honduras	31.67	31.67	0.03	○
135	Sudan	31.67	31.67	0.03	○
138	Barbados	30.83	30.83	0.02	○
139	Myanmar	29.17	29.17	0.01	○
139	Venezuela, Bolivarian Rep.	29.17	29.17	0.01	○
141	Costa Rica	28.33	28.33	0.00	○

SOURCE: World Bank. Doing *Business 2015: Going Beyond Efficiency*

NOTE: ● indicates a strength; ○ a weakness

4.2.2 Market capitalization

Market capitalization of listed companies (% of GDP) | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Hong Kong (China)	421.93	100.00	0.99	●
1	Switzerland	161.99	100.00	0.99	●
3	South Africa	160.15	98.86	0.98	●
4	Malaysia	156.04	96.32	0.97	●
5	Singapore	144.34	89.08	0.96	
6	Luxembourg	124.95	77.09	0.95	
7	Chile	117.68	72.58	0.94	●
8	United States of America	115.50	71.24	0.93	
9	United Kingdom	115.47	71.22	0.93	
10	Canada	110.69	68.26	0.92	
11	Barbados	106.39	65.60	0.91	●
12	Philippines	105.56	65.09	0.90	●
13	Thailand	104.65	64.53	0.89	
14	Sweden	103.06	63.54	0.88	
15	Korea, Rep.	96.54	59.51	0.87	
16	Zimbabwe	94.74	58.39	0.86	●
17	Montenegro	94.58	58.30	0.85	●
18	Jordan	87.05	53.64	0.84	●
19	Australia	83.84	51.65	0.83	
20	Netherlands	79.09	48.71	0.82	
21	Spain	73.40	45.19	0.81	
22	Colombia	70.78	43.57	0.80	
23	Denmark	69.77	42.95	0.79	
24	India	67.97	41.83	0.79	●
25	France	67.86	41.77	0.78	
26	Qatar	66.41	40.87	0.77	
27	Trinidad and Tobago	64.71	39.82	0.76	●
28	Finland	62.04	38.17	0.75	
29	Mauritius	61.99	38.13	0.74	
30	Japan	61.82	38.03	0.73	
31	Belgium	60.15	37.00	0.72	
32	Israel	57.71	35.49	0.71	
33	Kuwait	55.79	34.30	0.70	●
34	Morocco	54.88	33.74	0.69	●
35	Brazil	54.69	33.62	0.68	
36	Bahrain	52.23	32.10	0.67	
37	Saudi Arabia	50.87	31.26	0.66	
38	Norway	50.59	31.08	0.65	
39	Peru	50.28	30.89	0.64	
40	Ireland	49.11	30.17	0.64	
41	New Zealand	46.54	28.58	0.63	
42	Indonesia	45.26	27.78	0.62	
43	El Salvador	45.11	27.69	0.61	
44	China	44.93	27.58	0.60	
45	Mexico	44.25	27.16	0.59	
46	Russian Federation	43.35	26.60	0.58	
47	Jamaica	43.19	26.51	0.57	
48	Germany	42.07	25.81	0.56	
49	Malta	40.97	25.13	0.55	
50	Turkey	39.14	24.00	0.54	
51	Croatia	38.17	23.40	0.53	
52	Uganda	36.40	22.30	0.52	
53	Poland	35.82	21.94	0.51	
54	Panama	33.05	20.23	0.50	
55	Botswana	31.56	19.31	0.50	
56	Portugal	30.06	18.38	0.49	
57	Kenya	29.38	17.96	0.48	
58	Côte d'Ivoire	28.89	17.66	0.47	●
59	Sri Lanka	28.70	17.54	0.46	
60	Iran, Islamic Rep.	28.02	17.12	0.45	
61	Austria	26.02	15.88	0.44	○
62	Oman	25.95	15.83	0.43	
63	Lebanon	23.83	14.53	0.42	
64	Italy	22.97	13.99	0.41	
65	Egypt	22.07	13.44	0.40	
66	Nepal	21.66	13.18	0.39	
67	Guyana	21.43	13.04	0.38	
68	Viet Nam	21.14	12.86	0.37	
69	Iceland	19.92	12.10	0.36	○
70	Tunisia	19.64	11.94	0.36	
71	Pakistan	19.47	11.83	0.35	
72	Serbia	18.27	11.08	0.34	
73	United Arab Emirates	18.25	11.07	0.33	○
74	Czech Republic	17.97	10.90	0.32	○
75	Greece	17.87	10.84	0.31	
76	Malawi	17.77	10.78	0.30	
77	Hungary	16.62	10.07	0.29	○
78	Bolivia, Plurinational St.	16.44	9.95	0.28	
79	Slovenia	14.00	8.44	0.27	○
80	Bangladesh	13.11	7.89	0.26	
81	Bulgaria	12.68	7.63	0.25	○
82	Mongolia	12.53	7.53	0.24	
83	Nigeria	12.18	7.32	0.23	
84	Zambia	12.04	7.23	0.22	
85	Fiji	11.75	7.05	0.21	
86	Ukraine	11.73	7.04	0.21	○
87	Kazakhstan	11.54	6.93	0.20	
88	Estonia	10.29	6.15	0.19	○
89	Namibia	10.01	5.98	0.18	
90	Romania	9.40	5.60	0.17	○
91	Lithuania	9.36	5.57	0.16	○
92	Cyprus	8.77	5.21	0.15	○
93	Ghana	8.30	4.92	0.14	
94	Ecuador	6.75	3.96	0.13	
95	Swaziland (2007)	6.65	3.90	0.12	
96	Venezuela, Bolivarian Rep.	6.64	3.89	0.11	
97	Tanzania, United Rep.	6.38	3.73	0.10	
98	Georgia	5.95	3.47	0.09	○
99	TFYR of Macedonia	5.84	3.39	0.08	○
100	Argentina	5.68	3.30	0.07	○
101	Slovakia	4.97	2.86	0.07	○
102	Costa Rica	4.44	2.53	0.06	○
103	Uzbekistan (2006)	4.20	2.38	0.05	○
104	Latvia	3.93	2.21	0.04	○
105	Paraguay	3.91	2.20	0.03	○
106	Kyrgyzstan	2.50	1.33	0.02	○
107	Armenia	1.33	0.60	0.01	○
108	Uruguay	0.35	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Algeria	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Azerbaijan	n/a	n/a	n/a	
n/a	Belarus	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Moldova, Rep.	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	

SOURCE: Standard and Poor's, Global Stock Markets Factbook and supplemental S&P data; extracted from World Bank *World Development Indicators* database

NOTE: ● indicates a strength; ○ a weakness

4.2.3 Total value of stocks traded

Stocks traded, total value (% of GDP) | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Hong Kong (China)	468.12	100.00	0.98	●
1	Korea, Rep.	123.80	100.00	0.98	●
1	United States of America	132.25	100.00	0.98	●
4	Switzerland	96.23	77.73	0.97	
5	United Kingdom	95.17	76.87	0.96	
6	South Africa	81.55	65.87	0.95	●
7	Spain	79.44	64.17	0.94	●
8	China	70.80	57.19	0.94	
9	Saudi Arabia	70.09	56.61	0.93	●
10	Sweden	69.17	55.87	0.92	
11	Australia	68.54	55.36	0.91	
12	Canada	66.32	53.57	0.90	
13	Thailand	62.70	50.65	0.89	●
14	Japan	60.55	48.91	0.88	
15	Singapore	54.53	44.04	0.87	
16	Netherlands	53.61	43.30	0.86	
17	Finland	49.26	39.79	0.85	
18	Turkey	44.18	35.68	0.84	●
19	France	41.93	33.87	0.83	
20	Malaysia	40.78	32.94	0.82	
21	Brazil	37.11	29.97	0.81	●
22	Italy	36.32	29.33	0.81	
23	Russian Federation	36.30	29.32	0.80	
24	Germany	34.69	28.02	0.79	
25	India	33.49	27.05	0.78	●
26	Denmark	32.74	26.45	0.77	
27	Norway	26.57	21.46	0.76	
28	Israel	26.18	21.15	0.75	
29	Belgium	20.70	16.72	0.74	
30	Chile	17.55	14.18	0.73	
31	New Zealand	14.58	11.78	0.72	
32	Philippines	13.86	11.20	0.71	●
33	Poland	13.55	10.95	0.70	
34	Kuwait	13.21	10.67	0.69	●
35	Zimbabwe	12.91	10.42	0.69	●
36	Portugal	12.21	9.86	0.68	
37	Austria	11.58	9.36	0.67	
38	Indonesia	10.46	8.45	0.66	
39	Mexico	9.96	8.04	0.65	
40	Bangladesh	9.41	7.60	0.64	●
41	Jordan	8.99	7.26	0.63	
42	Hungary	8.58	6.93	0.62	
43	Qatar	8.05	6.50	0.61	
44	Egypt	7.67	6.19	0.60	
45	Colombia	7.02	5.67	0.59	
46	Greece	5.95	4.80	0.58	
47	Ireland	5.46	4.41	0.57	○
48	Pakistan	5.33	4.31	0.56	●
49	Czech Republic	4.94	3.99	0.56	
50	Iceland	4.83	3.90	0.55	
51	United Arab Emirates	4.74	3.83	0.54	
52	Iran, Islamic Rep.	4.39	3.54	0.53	
53	Morocco	3.65	2.95	0.52	
54	Oman	3.42	2.76	0.51	
55	Sri Lanka	2.82	2.28	0.50	
56	Tunisia	2.77	2.23	0.49	
57	Mauritius	2.59	2.09	0.48	
58	Peru	2.59	2.09	0.47	
59	Viet Nam	2.17	1.75	0.46	
60	Kenya	2.00	1.62	0.45	
61	Jamaica	1.39	1.12	0.44	
62	Cyprus	1.28	1.03	0.44	
63	Romania	1.26	1.01	0.43	
64	Montenegro	1.06	0.85	0.42	
65	Bahrain	1.00	0.81	0.41	
66	Lebanon	0.94	0.76	0.40	
67	Nigeria	0.91	0.73	0.39	
68	Croatia	0.87	0.70	0.38	○
69	Slovenia	0.86	0.70	0.37	○
70	Estonia	0.79	0.64	0.36	○
71	Zambia	0.78	0.63	0.35	
72	Botswana	0.78	0.63	0.34	
73	Serbia	0.71	0.57	0.33	
74	Bulgaria	0.69	0.55	0.32	
75	Ukraine	0.68	0.55	0.31	
76	Côte d'Ivoire	0.60	0.48	0.31	
77	Kazakhstan	0.55	0.44	0.30	
78	Trinidad and Tobago	0.50	0.40	0.29	
79	Malta	0.49	0.39	0.28	○
80	Barbados	0.43	0.35	0.27	
81	Lithuania	0.40	0.32	0.26	○
82	Mongolia	0.40	0.32	0.25	
83	Malawi	0.38	0.31	0.24	
84	TFYR of Macedonia	0.32	0.26	0.23	○
85	Panama	0.30	0.24	0.22	
86	Nepal	0.26	0.21	0.21	
87	Argentina	0.24	0.19	0.20	
88	Moldova, Rep. (2009)	0.24	0.19	0.19	○
89	El Salvador	0.22	0.18	0.19	
90	Paraguay	0.21	0.17	0.18	
91	Luxembourg	0.21	0.16	0.17	○
92	Uzbekistan (2011)	0.18	0.15	0.16	
93	Slovakia	0.18	0.14	0.15	○
94	Fiji	0.17	0.14	0.14	○
95	Namibia	0.16	0.13	0.13	○
96	Ecuador	0.16	0.12	0.12	○
97	Ghana	0.13	0.10	0.11	
98	Latvia	0.11	0.09	0.10	○
99	Tanzania, United Rep.	0.09	0.07	0.09	
100	Kyrgyzstan	0.08	0.07	0.08	
101	Costa Rica	0.07	0.06	0.07	○
102	Bolivia, Plurinational St.	0.07	0.06	0.06	○
103	Uganda	0.06	0.04	0.06	○
104	Guyana (2008)	0.04	0.03	0.05	○
105	Georgia	0.01	0.01	0.04	○
106	Armenia	0.01	0.01	0.03	○
107	Venezuela, Bolivarian Rep.	0.01	0.01	0.02	○
108	Uruguay	0.00	0.00	0.01	○
109	Swaziland (2006)	0.00	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Algeria	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Azerbaijan	n/a	n/a	n/a	
n/a	Belarus	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	

SOURCE: Standard and Poor's, Global Stock Markets Factbook and supplemental S&P data; extracted from World Bank *World Development Indicators* database

NOTE: ● indicates a strength; ○ a weakness

4.2.4 Venture capital deals

Venture capital per investment location: Number of deals (per trillion PPP$ GDP) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Finland	1.21	100.00	0.99	●
1	Mauritius	0.81	100.00	0.99	●
3	Israel	0.78	96.16	0.97	●
4	Canada	0.74	90.43	0.96	●
5	Luxembourg	0.68	83.67	0.94	
6	United States of America	0.66	80.74	0.93	
7	Switzerland	0.57	70.42	0.92	
8	Denmark	0.47	58.08	0.90	
9	Ireland	0.41	49.80	0.89	
10	Hong Kong (China)	0.37	46.00	0.88	
11	Singapore	0.36	43.64	0.86	
12	United Kingdom	0.35	42.94	0.85	
13	Sweden	0.30	36.39	0.83	
14	Estonia	0.25	30.96	0.82	
15	France	0.24	29.86	0.81	
16	Germany	0.16	20.10	0.79	
17	Norway	0.16	19.83	0.78	
18	Lithuania	0.15	18.41	0.76	
19	Portugal	0.15	17.86	0.75	
20	Iceland	0.14	17.19	0.74	
21	Netherlands	0.13	15.58	0.72	
22	New Zealand	0.11	13.81	0.71	
23	Kenya	0.11	13.81	0.69	
24	Jordan	0.11	13.78	0.68	
25	Spain	0.11	13.54	0.67	
26	Austria	0.10	12.31	0.65	
27	Lebanon	0.10	12.00	0.64	
28	Belgium	0.09	10.60	0.63	
29	Australia	0.09	10.42	0.61	
30	Armenia	0.08	10.00	0.60	
31	Cyprus	0.07	8.84	0.58	
32	Uruguay	0.07	8.66	0.57	
33	Japan	0.07	8.49	0.56	
34	China	0.07	8.42	0.54	
35	India	0.06	7.65	0.53	
36	Latvia	0.06	7.52	0.51	
37	Georgia	0.06	7.06	0.50	
38	Korea, Rep.	0.05	6.57	0.49	
39	Uganda	0.05	6.26	0.47	
40	Czech Republic	0.05	5.73	0.46	
41	Zimbabwe	0.04	4.40	0.44	
42	Hungary	0.04	4.36	0.43	
43	Italy	0.04	4.32	0.42	
44	Russian Federation	0.03	4.04	0.40	
45	Nicaragua	0.03	4.04	0.39	
46	Malaysia	0.03	3.49	0.38	
47	Ghana	0.03	3.27	0.36	
48	United Arab Emirates	0.03	2.94	0.35	○
49	Greece	0.02	2.89	0.33	
50	Philippines	0.02	2.53	0.32	
51	Ukraine	0.02	2.52	0.31	
52	Brazil	0.02	2.39	0.29	
53	Poland	0.02	2.31	0.28	○
54	South Africa	0.02	2.31	0.26	○
55	Slovenia	0.02	1.87	0.25	○
56	Tanzania, United Rep.	0.02	1.80	0.24	
57	Panama	0.01	1.47	0.22	
58	Argentina	0.01	1.42	0.21	
59	Thailand	0.01	1.36	0.19	○
60	Viet Nam	0.01	1.31	0.18	○
61	Colombia	0.01	1.01	0.17	○
62	Mexico	0.01	1.01	0.15	○
63	Bulgaria	0.01	0.82	0.14	○
64	Ethiopia	0.01	0.71	0.13	
65	Indonesia	0.01	0.69	0.11	
66	Oman	0.01	0.62	0.10	○
67	Romania	0.01	0.49	0.08	○
68	Chile	0.00	0.46	0.07	○
69	Turkey	0.00	0.43	0.06	○
70	Nigeria	0.00	0.33	0.04	
71	Kuwait	0.00	0.29	0.03	○
72	Saudi Arabia	0.00	0.17	0.01	○
73	Pakistan	0.00	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Algeria	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Azerbaijan	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Belarus	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Costa Rica	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Croatia	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	Egypt	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Kazakhstan	n/a	n/a	n/a	
n/a	Kyrgyzstan	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Malta	n/a	n/a	n/a	
n/a	Moldova, Rep.	n/a	n/a	n/a	
n/a	Mongolia	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Morocco	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Peru	n/a	n/a	n/a	
n/a	Qatar	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Serbia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Slovakia	n/a	n/a	n/a	
n/a	Sri Lanka	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	TFYR of Macedonia	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Tunisia	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	

SOURCE: Thomson Reuters, *Thomson One Banker Private Equity* database; International Monetary Fund *World Economic Outlook Database, 2015* (PPP$ GDP)

NOTE: ● indicates a strength; ○ a weakness

4.3.1 Applied tariff rate, weighted mean

Tariff rate, applied, weighted mean, all products (%) | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Singapore (2009)	0.07	100.00	1.00	●
2	Norway	0.30	99.19	0.99	●
3	Georgia	0.68	97.84	0.99	●
4	Israel	0.73	97.66	0.98	●
5	Canada	0.83	97.31	0.96	●
5	Mauritius	0.83	97.31	0.96	●
7	Switzerland (2009)	0.99	96.74	0.96	
8	Iceland	1.01	96.67	0.95	
9	Austria	1.02	96.64	0.75	
9	Belgium	1.02	96.64	0.75	
9	Bulgaria	1.02	96.64	0.75	
9	Cyprus	1.02	96.64	0.75	
9	Czech Republic	1.02	96.64	0.75	
9	Denmark	1.02	96.64	0.75	
9	Estonia	1.02	96.64	0.75	
9	Finland	1.02	96.64	0.75	
9	France	1.02	96.64	0.75	
9	Germany	1.02	96.64	0.75	
9	Greece	1.02	96.64	0.75	
9	Hungary	1.02	96.64	0.75	
9	Ireland	1.02	96.64	0.75	
9	Italy	1.02	96.64	0.75	
9	Latvia	1.02	96.64	0.75	
9	Lithuania	1.02	96.64	0.75	
9	Luxembourg	1.02	96.64	0.75	
9	Malta	1.02	96.64	0.75	
9	Netherlands	1.02	96.64	0.75	
9	Poland	1.02	96.64	0.75	
9	Portugal	1.02	96.64	0.75	
9	Romania	1.02	96.64	0.75	●
9	Slovakia	1.02	96.64	0.75	
9	Slovenia	1.02	96.64	0.75	
9	Spain	1.02	96.64	0.75	
9	Sweden	1.02	96.64	0.75	
9	United Kingdom	1.02	96.64	0.75	
36	Albania	1.09	96.39	0.75	●
37	Japan	1.22	95.93	0.74	
38	Croatia	1.37	95.40	0.73	
39	Bosnia and Herzegovina	1.41	95.26	0.72	●
40	Peru (2011)	1.51	94.90	0.72	
41	United States of America	1.54	94.80	0.71	
42	New Zealand (2010)	1.62	94.51	0.70	
43	Australia (2011)	1.81	93.84	0.70	
44	TFYR of Macedonia	1.86	93.66	0.69	
45	Belarus	1.95	93.35	0.68	
46	Ukraine	2.06	92.96	0.67	
47	Mexico (2010)	2.19	92.50	0.67	
48	Armenia	2.29	92.14	0.66	
49	Nicaragua (2010)	2.30	92.11	0.65	●
50	El Salvador	2.42	91.68	0.64	
50	Kyrgyzstan	2.42	91.68	0.64	
52	Indonesia (2011)	2.59	91.08	0.63	
53	Moldova, Rep.	2.62	90.97	0.62	
54	Montenegro	2.63	90.94	0.62	
55	Guatemala	2.74	90.55	0.60	
55	Turkey (2011)	2.74	90.55	0.60	
57	Kazakhstan	2.96	89.77	0.59	
58	Costa Rica (2010)	3.09	89.31	0.59	
59	Myanmar (2008)	3.18	88.99	0.58	●
60	Morocco	3.40	88.21	0.57	
61	Bolivia, Plurinational St.	3.66	87.29	0.57	●
62	United Arab Emirates	3.77	86.90	0.56	
63	Malaysia (2009)	3.95	86.27	0.55	
64	Chile (2010)	4.02	86.02	0.54	
65	Oman	4.08	85.81	0.54	
66	China (2011)	4.10	85.73	0.53	
67	Qatar	4.12	85.66	0.51	
67	Zambia	4.12	85.66	0.51	
69	Uruguay	4.13	85.63	0.51	
70	South Africa	4.24	85.24	0.50	
71	Ecuador	4.26	85.17	0.49	
72	Paraguay	4.29	85.06	0.49	
73	Saudi Arabia	4.30	85.03	0.48	
74	Kuwait	4.37	84.78	0.47	
75	Colombia	4.41	84.64	0.46	
76	Azerbaijan	4.48	84.39	0.46	
77	Rwanda	4.64	83.82	0.45	
78	Mozambique (2010)	4.75	83.43	0.44	
79	Philippines (2010)	4.77	83.36	0.43	
80	Lebanon (2007)	4.81	83.22	0.43	
81	Thailand (2009)	4.92	82.83	0.42	
82	Russian Federation	4.99	82.58	0.41	
83	Mongolia (2011)	5.13	82.09	0.40	
83	Uzbekistan	5.13	82.09	0.40	
85	Jordan (2009)	5.18	81.91	0.39	
86	Tajikistan	5.23	81.73	0.38	
87	Argentina	5.56	80.57	0.38	
88	Viet Nam (2010)	5.66	80.21	0.37	
89	Bahrain	5.69	80.11	0.36	
90	Serbia (2005)	6.03	78.90	0.36	
91	Dominican Republic (2010)	6.09	78.69	0.35	
92	Yemen	6.23	78.19	0.34	●
93	Botswana	6.39	77.63	0.33	
94	Burundi	6.41	77.56	0.32	
94	Malawi	6.41	77.56	0.32	
96	Honduras (2009)	6.46	77.38	0.31	
97	Guyana	6.50	77.24	0.30	
98	Uganda	6.68	76.60	0.30	
99	Sri Lanka	6.74	76.39	0.29	
100	Côte d'Ivoire	6.79	76.21	0.28	
101	Namibia	6.92	75.75	0.28	
102	Swaziland	6.98	75.54	0.27	
103	Angola (2009)	7.44	73.91	0.26	●
104	Jamaica (2011)	7.45	73.88	0.25	
105	Panama (2009)	7.61	73.31	0.25	
106	Brazil	7.73	72.88	0.24	
107	Senegal	8.02	71.86	0.23	
108	Egypt (2009)	8.05	71.75	0.22	
109	India (2009)	8.18	71.29	0.22	
110	Burkina Faso	8.35	70.69	0.21	
111	Mali	8.40	70.51	0.20	
112	Ghana (2009)	8.58	69.88	0.20	
113	Algeria (2009)	8.61	69.77	0.19	
114	Venezuela, Bolivarian Rep.	8.62	69.73	0.18	
115	Korea, Rep. (2010)	8.71	69.42	0.17	○
116	Madagascar	9.14	67.89	0.17	
117	Pakistan (2009)	9.53	66.51	0.16	
118	Niger	9.68	65.98	0.15	
119	Fiji (2011)	9.89	65.24	0.14	○
120	Cambodia (2008)	9.91	65.17	0.14	
121	Trinidad and Tobago (2008)	10.03	64.74	0.13	
122	Cabo Verde (2011)	10.20	64.14	0.12	
123	Ethiopia	10.33	63.68	0.12	
124	Kenya	10.49	63.12	0.11	
125	Nigeria (2010)	10.55	62.90	0.10	
126	Togo	11.08	61.03	0.09	
127	Tanzania, United Rep.	11.54	59.40	0.09	
128	Nepal	11.57	59.29	0.08	○
129	Guinea	11.91	58.09	0.07	
130	Gambia	12.49	56.04	0.07	○
131	Cameroon	12.65	55.47	0.06	○
132	Lesotho	12.70	55.29	0.05	○
133	Bangladesh (2008)	13.00	54.23	0.04	○
134	Sudan (2011)	14.73	48.11	0.04	
135	Barbados (2007)	14.77	47.96	0.03	○
136	Tunisia (2008)	15.95	43.79	0.02	○
137	Bhutan (2007)	17.75	37.42	0.01	○
138	Iran, Islamic Rep. (2011)	21.77	23.19	0.01	○
139	Seychelles (2007)	28.32	0.00	0.00	○
n/a	Hong Kong (China)	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: World Bank, based on UNCTAD TRAINS,WTO, IDB, CTS, and UN COMTRADE databases; extracted from World Bank *World Development Indicators* database

NOTE: ● indicates a strength; ○ a weakness

4.3.2 Intensity of local competition

Average answer to the survey question: In your country, how intense is competition in the local markets? [1 = not intense at all; 7 = extremely intense] | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Japan	6.37	89.52	1.00	●
2	Malta	6.09	84.76	0.99	●
3	Hong Kong (China)	6.06	84.30	0.98	●
4	United Kingdom	6.05	84.22	0.98	●
5	Belgium	6.05	84.09	0.97	●
6	Australia	5.99	83.24	0.96	●
7	United Arab Emirates	5.96	82.60	0.95	●
8	United States of America	5.94	82.28	0.95	
9	Turkey	5.93	82.16	0.94	●
10	Germany	5.91	81.84	0.93	
11	Korea, Rep.	5.89	81.52	0.92	
12	Netherlands	5.87	81.10	0.92	
13	Austria	5.82	80.29	0.91	●
14	Sri Lanka	5.76	79.41	0.90	●
15	Czech Republic	5.73	78.88	0.89	
16	Qatar	5.73	78.75	0.89	
17	Switzerland	5.71	78.48	0.88	
18	Singapore	5.67	77.75	0.87	
19	Kenya	5.66	77.64	0.86	●
20	Lithuania	5.62	77.07	0.86	●
21	Latvia	5.61	76.84	0.85	
22	Mauritius	5.60	76.73	0.84	
23	Zambia	5.59	76.57	0.83	●
24	New Zealand	5.59	76.54	0.83	
25	Chile	5.59	76.51	0.82	
26	Barbados	5.58	76.41	0.81	
27	Estonia	5.55	75.83	0.80	
28	Lebanon	5.52	75.27	0.80	●
29	France	5.51	75.11	0.79	
30	Slovakia	5.50	75.03	0.78	
31	Canada	5.50	74.99	0.77	
32	Malaysia	5.50	74.95	0.77	
33	Spain	5.48	74.60	0.76	
34	South Africa	5.46	74.36	0.75	
35	Cyprus	5.43	73.76	0.74	
36	Thailand	5.42	73.67	0.73	
37	Jamaica	5.41	73.49	0.73	●
38	Saudi Arabia	5.41	73.48	0.72	
39	Sweden	5.41	73.47	0.71	
40	Guatemala	5.40	73.40	0.70	●
41	TFYR of Macedonia	5.39	73.21	0.70	
42	China	5.36	72.64	0.69	
43	Denmark	5.36	72.63	0.68	
44	Bahrain	5.35	72.58	0.67	
45	Hungary	5.35	72.48	0.67	
46	Morocco	5.34	72.37	0.66	
47	Norway	5.34	72.28	0.65	
48	Nigeria	5.28	71.32	0.64	●
49	Poland	5.27	71.20	0.64	
50	Brazil	5.27	71.19	0.63	
51	Indonesia	5.26	71.04	0.62	
52	Luxembourg	5.25	70.77	0.61	
53	Uganda	5.24	70.68	0.61	●
54	Colombia	5.22	70.35	0.60	
55	Jordan	5.20	69.92	0.59	
56	Italy	5.19	69.84	0.58	
57	Costa Rica	5.18	69.73	0.58	
58	Ireland	5.17	69.56	0.57	○
59	Philippines	5.15	69.25	0.56	
60	Trinidad and Tobago	5.15	69.24	0.55	
61	Portugal	5.14	69.08	0.55	
62	Mexico	5.13	68.91	0.54	
63	Viet Nam	5.12	68.73	0.53	
64	Slovenia	5.12	68.59	0.52	
65	Panama	5.10	68.37	0.52	
66	Paraguay	5.08	67.94	0.51	
67	Peru	5.07	67.80	0.50	
68	Greece	5.05	67.55	0.49	
69	Dominican Republic	5.00	66.65	0.48	
70	Oman	5.00	66.62	0.48	
71	Russian Federation	4.97	66.23	0.47	
72	Bulgaria	4.96	66.06	0.46	
73	Malawi	4.95	65.77	0.45	
74	Zimbabwe	4.94	65.62	0.45	
75	Rwanda	4.93	65.56	0.44	
76	Bangladesh	4.92	65.37	0.43	
77	Iceland	4.90	64.92	0.42	
78	Senegal	4.89	64.75	0.42	
79	Mongolia	4.88	64.73	0.41	
80	Croatia	4.88	64.71	0.40	
81	Pakistan	4.87	64.53	0.39	
82	Armenia	4.87	64.48	0.39	
83	Cambodia	4.86	64.30	0.38	
84	Gambia	4.85	64.23	0.37	
85	Honduras	4.81	63.45	0.36	
86	El Salvador	4.80	63.39	0.36	
87	Madagascar	4.80	63.26	0.35	
88	India	4.79	63.09	0.34	
89	Tunisia	4.78	62.94	0.33	
90	Lesotho	4.77	62.86	0.33	
91	Nepal	4.77	62.77	0.32	
92	Botswana	4.75	62.44	0.31	
93	Mozambique	4.72	61.93	0.30	
94	Mali	4.70	61.73	0.30	
95	Moldova, Rep.	4.68	61.35	0.29	
96	Myanmar	4.68	61.34	0.28	●
97	Ukraine	4.68	61.33	0.27	
98	Guyana	4.67	61.12	0.27	
99	Uruguay	4.66	61.05	0.26	
100	Namibia	4.64	60.67	0.25	
101	Georgia	4.64	60.67	0.24	
102	Bhutan	4.61	60.23	0.23	
103	Kyrgyzstan	4.61	60.12	0.23	
104	Finland	4.60	60.04	0.22	○
105	Cameroon	4.58	59.70	0.21	
106	Burkina Faso	4.57	59.42	0.20	
107	Kazakhstan	4.56	59.27	0.20	
108	Côte d'Ivoire	4.55	59.21	0.19	
109	Ethiopia	4.53	58.77	0.18	
110	Kuwait	4.51	58.48	0.17	
111	Swaziland	4.51	58.44	0.17	
112	Cabo Verde	4.46	57.61	0.16	
113	Ghana	4.45	57.44	0.15	
114	Iran, Islamic Rep.	4.40	56.59	0.14	
115	Romania	4.36	55.96	0.14	○
116	Azerbaijan	4.35	55.81	0.13	○
117	Tajikistan	4.32	55.33	0.12	
118	Tanzania, United Rep.	4.32	55.30	0.11	
119	Yemen	4.27	54.46	0.11	
120	Israel	4.24	54.04	0.10	○
121	Seychelles	4.23	53.85	0.09	○
122	Serbia	4.20	53.33	0.08	○
123	Guinea	4.20	53.28	0.08	
124	Nicaragua	4.18	52.92	0.07	○
125	Argentina	4.07	51.22	0.06	○
126	Egypt	4.05	50.81	0.05	○
127	Burundi	3.91	48.56	0.05	
128	Montenegro	3.88	48.00	0.04	○
129	Algeria	3.80	46.74	0.03	○
130	Bolivia, Plurinational St.	3.76	46.00	0.02	○
131	Albania	3.49	41.51	0.02	○
132	Venezuela, Bolivarian Rep.	2.87	31.15	0.01	○
133	Angola	2.60	26.69	0.00	○
n/a	Belarus	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	

SOURCE: World Economic Forum, *Executive Opinion Survey 2014–2015*

NOTE: ● indicates a strength; ○ a weakness

5.1.1 Employment in knowledge-intensive services

Employment in knowledge-intensive services (% of workforce) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Luxembourg	59.07	100.00	1.00	●
2	Singapore	52.67	89.04	0.99	●
3	Switzerland	50.98	86.13	0.98	●
4	Sweden (2014)	49.39	83.40	0.97	●
5	Iceland	49.27	83.21	0.97	●
6	United Kingdom	47.72	80.54	0.96	
7	Norway	46.85	79.05	0.95	
8	Israel	46.49	78.43	0.94	
9	Netherlands	46.44	78.36	0.93	
10	Denmark	45.50	76.74	0.92	
11	Finland	44.69	75.35	0.91	
12	Belgium	44.39	74.84	0.90	
13	France	44.36	74.78	0.90	●
14	Canada	44.17	74.45	0.89	
15	Australia	43.76	73.75	0.88	
16	Russian Federation	43.60	73.48	0.87	●
17	New Zealand (2008)	42.92	72.32	0.86	
18	Germany	42.87	72.23	0.85	
19	Lithuania	42.81	72.13	0.84	●
20	Slovenia	42.18	71.04	0.83	
21	Estonia	41.84	70.47	0.83	
22	Malta	40.59	68.32	0.82	
23	Ireland	40.46	68.09	0.81	
24	Austria	39.80	66.96	0.80	
25	Latvia	39.24	66.00	0.79	
26	United States of America	38.01	63.90	0.78	
27	Czech Republic	37.80	63.54	0.77	
28	Hong Kong (China)	37.31	62.69	0.77	
29	Montenegro (2012)	37.21	62.53	0.76	
30	Egypt	36.25	60.88	0.75	●
31	United Arab Emirates (2008)	36.09	60.60	0.74	
32	Poland	35.93	60.34	0.73	
33	Belarus (2009)	35.89	60.26	0.72	
34	Hungary	35.59	59.75	0.71	
35	Croatia	35.39	59.41	0.70	
36	Italy	35.14	58.98	0.70	
37	Cyprus	35.14	58.97	0.69	
38	Portugal (2014)	34.83	58.44	0.68	
39	Ukraine	33.74	56.57	0.67	
40	Spain (2014)	33.09	55.46	0.66	
41	Kazakhstan	32.33	54.16	0.65	
42	Greece	32.27	54.05	0.64	
43	Lebanon (2007)	31.85	53.34	0.63	
44	Slovakia	31.76	53.19	0.63	
45	Bulgaria	30.97	51.82	0.62	
46	Barbados	30.90	51.71	0.61	
47	Moldova, Rep.	29.96	50.08	0.60	
48	Jordan (2004)	28.18	47.05	0.59	
49	Serbia	28.12	46.94	0.58	
50	TFYR of Macedonia	27.89	46.54	0.57	
51	Trinidad and Tobago	26.99	45.01	0.57	
52	Armenia (2011)	26.89	44.83	0.56	
53	Saudi Arabia	26.56	44.26	0.55	
54	Seychelles (2011)	26.36	43.92	0.54	
55	South Africa	25.52	42.48	0.53	
56	Costa Rica	25.01	41.61	0.52	
57	Malaysia	24.74	41.14	0.51	
58	Argentina (2012)	24.59	40.89	0.50	
59	Panama (2012)	24.39	40.54	0.50	
60	Chile	24.34	40.46	0.49	
61	Mongolia (2012)	24.33	40.44	0.48	
62	Japan	24.32	40.43	0.47	
63	Philippines	23.74	39.42	0.46	
64	Azerbaijan	23.40	38.84	0.45	
65	Uruguay (2011)	23.12	38.37	0.44	
66	Georgia (2007)	22.25	36.87	0.43	
67	Korea, Rep. (2012)	21.29	35.23	0.43	
68	Romania	21.17	35.02	0.42	
69	Brazil	21.04	34.80	0.41	
70	Tunisia (2012)	20.94	34.62	0.40	
71	Mauritius (2012)	20.37	33.66	0.39	
72	Jamaica (2008)	20.11	33.21	0.38	
73	Bangladesh (2011)	20.01	33.03	0.37	
74	Pakistan (2008)	19.48	32.12	0.37	
75	Venezuela, Bolivarian Rep.	19.17	31.60	0.36	
76	Turkey	19.17	31.58	0.35	
77	Mexico	19.14	31.54	0.34	
78	Paraguay	18.90	31.13	0.33	
79	Kuwait (2005)	18.70	30.78	0.32	
80	Qatar	18.25	30.01	0.31	
81	Botswana (2010)	17.92	29.45	0.30	
82	Algeria	17.57	28.84	0.30	
83	Kyrgyzstan	17.33	28.43	0.29	
84	Dominican Republic	17.18	28.18	0.28	
85	Yemen (2005)	16.97	27.82	0.27	●
86	Colombia (2010)	16.82	27.55	0.26	
87	Fiji (2010)	16.67	27.31	0.25	
88	Bhutan	16.47	26.97	0.24	
89	Albania (2009)	16.08	26.30	0.23	
90	Iran, Islamic Rep. (2010)	15.99	26.14	0.23	
91	Sri Lanka	15.67	25.60	0.22	
92	Bolivia, Plurinational St. (2009)	15.25	24.88	0.21	
93	Peru	14.96	24.37	0.20	
94	Nicaragua (2006)	14.82	24.14	0.19	
95	Namibia	14.55	23.68	0.18	
96	Ecuador	14.35	23.33	0.17	
97	Thailand	13.93	22.61	0.17	○
98	Honduras (2005)	12.83	20.73	0.16	
99	El Salvador	12.13	19.52	0.15	
100	Guatemala	10.85	17.32	0.14	
101	Viet Nam	9.99	15.86	0.13	○
102	Indonesia	8.90	13.98	0.12	
103	Ghana (2010)	8.61	13.48	0.11	
104	China (2005)	7.37	11.36	0.10	○
105	Zambia (2010)	7.28	11.21	0.10	
106	Morocco (2008)	6.79	10.36	0.09	○
107	Lesotho	6.76	10.32	0.08	
108	Zimbabwe (2011)	6.61	10.06	0.07	
109	Nepal (2008)	4.28	6.06	0.06	○
110	Cambodia (2010)	4.12	5.78	0.05	○
111	Uganda	4.09	5.73	0.04	○
112	Ethiopia	3.77	5.19	0.03	
113	Rwanda (2012)	3.76	5.16	0.03	○
114	Madagascar (2012)	3.54	4.79	0.02	○
115	Tanzania, United Rep. (2006)	2.57	3.12	0.01	○
116	Guinea (2010)	0.75	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	India	n/a	n/a	n/a	
n/a	Kenya	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	

SOURCE: International Labour Organization, *ILOSTAT Database of Labour Statistics* Beta version (2004–14)

NOTE: ● indicates a strength; ○ a weakness

5.1.2 Firms offering formal training

Firms offering formal training (% of firms) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	China (2012)	79.20	100.00	1.00	●
2	Thailand (2006)	75.30	94.85	0.99	●
3	Ireland (2005)	73.20	92.08	0.98	●
4	Ecuador (2010)	65.90	82.45	0.97	●
5	Colombia (2010)	65.20	81.53	0.96	●
6	Argentina (2010)	63.60	79.42	0.95	●
7	Kyrgyzstan	63.50	79.29	0.94	●
8	Guyana (2010)	63.00	78.63	0.94	●
9	Mongolia	62.30	77.70	0.93	●
10	El Salvador (2010)	61.00	75.99	0.91	●
10	Fiji (2009)	61.00	75.99	0.91	●
12	Peru (2010)	60.10	74.80	0.90	●
13	Chile (2010)	57.50	71.37	0.89	●
14	Bolivia, Plurinational St. (2010)	57.10	70.84	0.88	●
15	Dominican Republic (2010)	57.00	70.71	0.87	●
16	Venezuela, Bolivarian Rep. (2010)	56.00	69.39	0.86	●
17	Rwanda (2011)	55.40	68.60	0.85	●
18	Czech Republic	55.20	68.34	0.84	
19	Paraguay (2010)	54.90	67.94	0.83	●
20	Costa Rica (2010)	54.70	67.68	0.82	●
21	Bosnia and Herzegovina	52.10	64.25	0.81	●
22	Botswana (2010)	51.90	63.98	0.80	●
22	Guatemala (2010)	51.90	63.98	0.80	●
24	Spain (2005)	51.30	63.19	0.79	
25	Belarus	51.10	62.93	0.78	●
26	Swaziland (2006)	51.00	62.80	0.77	●
27	Mexico (2010)	50.80	62.53	0.76	
28	Malaysia (2007)	50.10	61.61	0.75	
29	Croatia	48.90	60.03	0.74	
30	Uruguay (2010)	48.60	59.63	0.73	●
31	Cambodia (2007)	48.40	59.37	0.71	●
31	Malawi (2009)	48.40	59.37	0.71	●
33	Nicaragua (2010)	47.20	57.78	0.70	●
34	Russian Federation (2012)	46.10	56.33	0.69	
35	TFYR of Macedonia	46.00	56.20	0.69	
36	Slovakia	44.90	54.75	0.68	
37	Namibia (2006)	44.50	54.22	0.67	●
38	Viet Nam (2009)	43.50	52.90	0.66	
39	Bulgaria	42.80	51.98	0.65	
40	Lesotho (2009)	42.50	51.58	0.64	●
41	Brazil (2009)	42.20	51.19	0.63	
42	Lithuania	42.00	50.92	0.62	
43	Slovenia	41.40	50.13	0.61	
44	Romania	40.80	49.34	0.60	
45	Kenya	40.60	49.08	0.59	
46	Ghana	40.10	48.42	0.58	
47	Korea, Rep. (2005)	39.50	47.63	0.57	
48	South Africa (2007)	36.80	44.06	0.56	
49	Honduras (2010)	35.80	42.74	0.56	
50	Barbados (2010)	35.50	42.35	0.55	
51	Germany (2005)	35.40	42.22	0.54	
52	Estonia	35.00	41.69	0.53	
53	Poland	34.60	41.16	0.52	
54	Uganda	34.30	40.77	0.51	
55	Tajikistan	33.60	39.84	0.50	
56	Moldova, Rep.	32.80	38.79	0.49	
57	Mali (2010)	32.10	37.86	0.47	
57	Niger (2009)	32.10	37.86	0.47	
59	Nepal	31.90	37.60	0.45	●
59	Portugal (2005)	31.90	37.60	0.45	○
61	Zimbabwe (2011)	31.20	36.68	0.44	
62	Philippines (2009)	31.10	36.54	0.44	
63	Togo (2009)	31.00	36.41	0.43	●
64	Tanzania, United Rep.	30.70	36.02	0.42	
65	Serbia	30.60	35.88	0.41	
66	Ethiopia (2011)	30.00	35.09	0.40	
67	Kazakhstan	28.40	32.98	0.38	
67	Turkey	28.40	32.98	0.38	
69	Zambia	28.20	32.72	0.37	
70	Trinidad and Tobago (2010)	28.00	32.45	0.36	
71	Lebanon	26.60	30.61	0.35	
72	Jamaica (2010)	25.90	29.68	0.34	
73	Nigeria (2007)	25.70	29.42	0.33	
74	Gambia (2006)	25.60	29.29	0.31	
74	Mauritius (2009)	25.60	29.29	0.31	
76	Cameroon (2009)	25.50	29.16	0.31	
77	Latvia	25.20	28.76	0.30	○
78	Burkina Faso (2009)	24.80	28.23	0.29	
79	Morocco (2007)	24.70	28.10	0.28	
80	Albania	23.80	26.91	0.27	
81	Montenegro	23.70	26.78	0.26	○
82	Angola (2010)	23.50	26.52	0.25	●
83	Bhutan (2009)	23.30	26.25	0.24	
84	Ukraine	22.50	25.20	0.23	
85	Burundi (2006)	22.10	24.67	0.21	
85	Mozambique (2007)	22.10	24.67	0.21	
87	Bangladesh	21.90	24.41	0.20	
88	Egypt (2008)	21.70	24.14	0.19	
89	Guinea (2006)	21.10	23.35	0.19	
90	Azerbaijan	20.30	22.30	0.18	
91	Greece (2005)	20.00	21.90	0.17	○
92	Côte d'Ivoire (2009)	19.10	20.71	0.16	
93	Israel	18.60	20.05	0.15	○
94	Sri Lanka (2011)	18.40	19.79	0.14	○
95	Algeria (2007)	17.30	18.34	0.13	
96	Cabo Verde (2009)	16.60	17.41	0.12	
97	Senegal (2007)	16.30	17.02	0.11	
98	India (2006)	15.90	16.49	0.10	○
99	Hungary	15.70	16.23	0.09	○
100	Myanmar (2014)	15.10	15.44	0.08	
101	Armenia	14.20	14.25	0.07	○
102	Yemen (2010)	12.90	12.53	0.06	
103	Madagascar	12.70	12.27	0.06	
104	Panama (2010)	11.00	10.03	0.05	○
105	Uzbekistan	10.90	9.89	0.04	○
106	Georgia	10.50	9.37	0.03	○
107	Pakistan (2007)	6.70	4.35	0.02	○
108	Indonesia (2009)	4.70	1.72	0.01	○
109	Jordan	3.40	0.00	0.00	○
n/a	Australia	n/a	n/a	n/a	
n/a	Austria	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Belgium	n/a	n/a	n/a	
n/a	Canada	n/a	n/a	n/a	
n/a	Cyprus	n/a	n/a	n/a	
n/a	Denmark	n/a	n/a	n/a	
n/a	Finland	n/a	n/a	n/a	
n/a	France	n/a	n/a	n/a	
n/a	Hong Kong (China)	n/a	n/a	n/a	
n/a	Iceland	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Italy	n/a	n/a	n/a	
n/a	Japan	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Luxembourg	n/a	n/a	n/a	
n/a	Malta	n/a	n/a	n/a	
n/a	Netherlands	n/a	n/a	n/a	
n/a	New Zealand	n/a	n/a	n/a	
n/a	Norway	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Qatar	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Singapore	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Sweden	n/a	n/a	n/a	
n/a	Switzerland	n/a	n/a	n/a	
n/a	Tunisia	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	United Kingdom	n/a	n/a	n/a	
n/a	United States of America	n/a	n/a	n/a	

SOURCE: International Finance Corporation and World Bank, *Enterprise Surveys* (2004–13)

NOTE: ● indicates a strength; ○ a weakness

5.1.3 GERD performed by business enterprise

GERD: Performed by business enterprise (% of GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Israel	3.48	100.00	1.00	●
2	Korea, Rep.	3.26	93.77	0.99	●
3	Japan	2.65	76.32	0.98	●
4	Finland	2.38	68.43	0.97	
5	Sweden	2.36	67.89	0.95	
6	Switzerland (2012)	2.17	62.30	0.94	
7	Germany	2.04	58.79	0.93	
8	Denmark	2.03	58.44	0.92	
9	Slovenia	2.03	58.35	0.91	
10	Austria	1.99	57.35	0.90	
11	United States of America (2012)	1.95	56.08	0.89	
12	Belgium	1.63	46.82	0.88	
13	China	1.60	45.89	0.86	
14	France	1.48	42.64	0.85	
15	Iceland (2011)	1.38	39.82	0.84	
16	Australia (2011)	1.30	37.46	0.83	
17	Singapore (2012)	1.23	35.42	0.82	
18	Netherlands	1.22	34.99	0.81	
19	Ireland (2012)	1.20	34.42	0.80	
20	United Kingdom	1.11	32.03	0.78	
21	Czech Republic	1.08	31.20	0.77	
22	Hungary	1.00	28.85	0.76	
23	Norway	0.89	25.49	0.75	
24	Estonia	0.84	24.25	0.74	
25	Canada	0.83	23.75	0.73	
26	Malaysia (2012)	0.73	20.90	0.72	
27	Luxembourg	0.71	20.31	0.70	
28	Italy	0.70	20.11	0.69	
29	Russian Federation	0.68	19.58	0.68	
30	Spain	0.68	19.53	0.67	
31	Portugal	0.67	19.17	0.66	
32	New Zealand (2011)	0.58	16.54	0.65	
33	Malta	0.48	13.74	0.64	
34	Turkey	0.45	12.95	0.63	
35	Belarus	0.45	12.90	0.61	
36	Ukraine	0.42	12.19	0.60	
37	Croatia	0.41	11.80	0.59	
38	Bulgaria	0.41	11.71	0.58	
39	Slovakia	0.39	11.27	0.57	
40	Poland	0.38	11.06	0.56	
41	South Africa (2012)	0.34	9.68	0.55	
42	Hong Kong (China) (2012)	0.33	9.38	0.53	
43	India (2011)	0.29	8.22	0.52	
44	Greece	0.27	7.85	0.51	
45	Lithuania	0.24	7.02	0.50	
46	Serbia (2012)	0.24	6.97	0.49	
47	Morocco (2010)	0.22	6.32	0.48	
48	Ecuador (2011)	0.20	5.87	0.47	
49	Thailand (2011)	0.20	5.64	0.45	
50	Uganda (2010)	0.19	5.58	0.44	
51	Mexico	0.19	5.44	0.43	
52	Latvia	0.17	4.86	0.42	
53	Bosnia and Herzegovina (2012)	0.16	4.58	0.41	
54	United Arab Emirates (2011)	0.14	4.02	0.40	
55	Argentina (2012)	0.13	3.60	0.39	
56	Chile (2012)	0.13	3.59	0.38	○
57	Qatar (2012)	0.12	3.50	0.36	
58	Romania	0.12	3.44	0.35	
59	Sudan (2005)	0.10	2.89	0.34	●
60	Montenegro (2011)	0.09	2.62	0.33	
61	Kenya (2010)	0.08	2.41	0.32	
62	Botswana (2005)	0.08	2.38	0.31	
63	Cyprus	0.08	2.32	0.30	
64	Iran, Islamic Rep. (2008)	0.08	2.28	0.28	
65	Costa Rica (2011)	0.08	2.16	0.27	
66	Moldova, Rep.	0.07	2.03	0.26	○
67	Sri Lanka (2010)	0.07	1.97	0.25	
68	Philippines (2007)	0.06	1.79	0.24	
69	Kazakhstan	0.05	1.53	0.23	
70	Colombia	0.05	1.51	0.22	
71	Viet Nam (2011)	0.05	1.42	0.20	
72	Peru (2004)	0.05	1.33	0.19	○
73	Uruguay (2012)	0.04	1.24	0.18	○
74	Kyrgyzstan (2011)	0.04	1.05	0.17	
75	TFYR of Macedonia (2011)	0.03	1.00	0.16	○
76	Oman (2011)	0.03	0.91	0.15	○
77	Azerbaijan	0.02	0.63	0.14	
78	Namibia (2010)	0.02	0.53	0.13	○
79	Indonesia (2009)	0.02	0.45	0.11	
80	Mongolia	0.01	0.40	0.10	○
81	Mali (2007)	0.01	0.21	0.09	
82	Ethiopia	0.01	0.21	0.08	
83	Zambia (2008)	0.01	0.20	0.07	○
84	Panama (2011)	0.00	0.10	0.06	○
85	Senegal (2010)	0.00	0.05	0.05	○
86	Trinidad and Tobago (2009)	0.00	0.03	0.03	○
87	Ghana (2010)	0.00	0.01	0.02	○
88	Paraguay (2011)	0.00	0.01	0.01	○
89	Guatemala (2012)	0.00	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Algeria	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Armenia	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Brazil	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Egypt	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Georgia	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mauritius	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Pakistan	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Tunisia	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

5.1.4 GERD financed by business enterprise

GERD: Financed by business enterprise (% of total GERD) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Korea, Rep.	75.68	100.00	1.00	●
2	Japan	75.48	99.73	0.99	●
3	China	74.60	98.57	0.98	●
4	Germany (2012)	66.07	87.29	0.97	●
5	Slovenia	63.85	84.35	0.96	●
6	Philippines (2007)	61.96	81.85	0.94	●
7	Australia (2008)	61.91	81.78	0.93	
8	Sweden	60.95	80.52	0.92	
9	Finland	60.84	80.37	0.91	
10	Switzerland (2012)	60.78	80.29	0.90	
11	Malaysia (2012)	60.20	79.52	0.89	
12	Belgium (2011)	60.15	79.46	0.88	
13	Denmark	59.78	78.97	0.87	
14	United States of America (2012)	59.13	78.11	0.86	
15	France (2012)	55.38	73.15	0.84	
16	Singapore (2012)	53.37	70.49	0.83	
17	Thailand (2011)	51.74	68.34	0.82	
18	Ireland (2012)	50.34	66.48	0.81	
19	Iceland (2011)	49.85	65.83	0.80	
20	Hong Kong (China) (2012)	49.73	65.67	0.79	
21	Turkey	48.87	64.54	0.78	●
22	Netherlands	47.10	62.20	0.77	
23	Hungary	46.80	61.80	0.76	
24	United Kingdom	46.55	61.46	0.74	
25	Canada	46.45	61.33	0.73	
26	Portugal (2012)	46.04	60.79	0.72	
27	Spain (2012)	45.64	60.27	0.71	
28	Austria (2014)	44.49	58.74	0.70	
29	Malta	44.33	58.53	0.69	
30	Italy (2012)	44.29	58.48	0.68	
31	Norway (2011)	44.20	58.36	0.67	
32	Belarus	43.79	57.82	0.66	
33	Brazil (2012)	43.07	56.87	0.64	
34	Croatia	42.79	56.49	0.63	
35	Estonia	41.28	54.50	0.62	
36	Sri Lanka (2010)	40.93	54.03	0.61	
37	Slovakia	40.19	53.06	0.60	
38	New Zealand (2011)	39.96	52.75	0.59	
39	Kyrgyzstan (2011)	38.58	50.93	0.58	
40	South Africa (2012)	38.34	50.61	0.57	
41	Czech Republic	37.60	49.62	0.56	
42	Poland	37.33	49.27	0.54	
43	Israel (2012)	35.60	46.98	0.53	
44	Chile (2012)	34.95	46.12	0.52	
45	Greece	32.06	42.30	0.51	
46	Mexico	31.65	41.76	0.50	
47	Romania	31.02	40.92	0.49	
48	Iran, Islamic Rep. (2008)	30.92	40.79	0.48	
49	Morocco (2010)	29.94	39.49	0.47	
50	Colombia	29.02	38.27	0.46	
51	Ukraine	28.99	38.25	0.44	
52	Kazakhstan	28.92	38.15	0.43	
53	Viet Nam (2011)	28.40	37.47	0.42	
54	Russian Federation	28.16	37.14	0.41	
55	Lithuania	27.42	36.17	0.40	
56	Qatar (2012)	24.18	31.89	0.39	
57	Montenegro (2011)	22.28	29.36	0.38	
58	Latvia	21.84	28.78	0.37	○
59	Argentina (2012)	21.34	28.12	0.36	
60	Luxembourg	20.46	26.96	0.34	
61	Namibia (2010)	19.83	26.12	0.33	
62	Bulgaria	19.44	25.61	0.32	○
63	Panama (2011)	18.86	24.84	0.31	
64	Costa Rica (2011)	18.85	24.82	0.30	
65	Tunisia (2012)	18.70	24.63	0.29	
66	Uruguay (2012)	15.03	19.78	0.28	
67	Uganda (2010)	13.67	17.98	0.27	
68	Burkina Faso (2009)	11.93	15.68	0.26	
69	Cyprus (2012)	10.86	14.26	0.24	○
70	Mali (2007)	10.10	13.26	0.23	
71	Mongolia	8.31	10.88	0.22	
72	Serbia (2012)	5.78	7.53	0.21	○
73	Bolivia, Plurinational St. (2009)	5.20	6.78	0.20	
74	Azerbaijan	4.59	5.97	0.19	
75	Oman (2011)	4.56	5.93	0.18	○
76	Kenya (2010)	4.34	5.64	0.17	
77	Senegal (2010)	4.10	5.31	0.16	
78	Lesotho (2009)	3.38	4.36	0.14	
79	Albania (2008)	3.26	4.21	0.13	
80	Zambia (2008)	3.23	4.16	0.12	
81	El Salvador (2012)	2.75	3.54	0.11	○
82	Tajikistan (2011)	1.65	2.08	0.10	
83	Kuwait	1.42	1.77	0.09	○
84	Bosnia and Herzegovina (2012)	1.15	1.42	0.08	○
85	Paraguay (2012)	0.85	1.02	0.07	○
86	Ethiopia	0.75	0.89	0.06	
87	Ecuador (2011)	0.42	0.44	0.04	○
88	Mauritius (2012)	0.27	0.26	0.03	○
89	Nigeria (2007)	0.16	0.11	0.02	○
90	Ghana (2010)	0.10	0.03	0.01	○
91	Tanzania, United Rep. (2010)	0.08	0.00	0.00	○
n/a	Algeria	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Armenia	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Egypt	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Georgia	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	India	n/a	n/a	n/a	
n/a	Indonesia	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Moldova, Rep.	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Pakistan	n/a	n/a	n/a	
n/a	Peru	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	TFYR of Macedonia	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

5.1.5 Females employed with advanced degrees

Females employed with advanced degrees, 25+ years old (% total employed) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Belarus (2009)	33.84	100.00	1.00	●
2	Russian Federation	32.93	97.29	0.99	●
3	Israel	28.38	83.83	0.98	●
4	Ukraine	28.10	83.01	0.97	●
5	Armenia	27.45	81.08	0.95	●
6	Lithuania (2014)	26.13	77.19	0.94	●
7	Estonia	25.45	75.17	0.93	●
8	Finland	25.29	74.69	0.92	
9	Ireland	24.75	73.09	0.91	
10	Sweden (2014)	23.27	68.73	0.90	
11	Norway	23.20	68.51	0.88	
12	Belgium (2014)	23.18	68.45	0.87	
13	Latvia	23.00	67.91	0.86	●
14	Singapore	22.73	67.13	0.85	
15	Australia	22.64	66.85	0.84	
16	Cyprus	22.59	66.71	0.83	
17	United Kingdom (2014)	21.73	64.17	0.81	
18	Spain (2014)	21.48	63.42	0.80	
19	Iceland	21.34	63.01	0.79	
20	New Zealand	20.83	61.49	0.78	
21	Denmark (2014)	20.60	60.83	0.77	
22	Luxembourg	20.32	59.99	0.76	
23	France	19.63	57.94	0.74	
24	Japan	19.29	56.94	0.73	
25	Slovenia	18.78	55.44	0.72	
26	Bulgaria	18.50	54.61	0.71	
27	Poland	18.16	53.60	0.70	
28	Netherlands	17.76	52.41	0.69	
29	Kazakhstan	17.55	51.80	0.67	
30	Switzerland (2014)	17.00	50.16	0.66	
31	Argentina (2012)	16.95	50.01	0.65	
32	Venezuela, Bolivarian Rep. (2012)	16.69	49.24	0.64	●
33	Panama (2012)	16.59	48.94	0.63	
34	Greece	15.79	46.59	0.62	
35	Canada (2014)	15.65	46.16	0.60	
36	Mongolia (2012)	15.44	45.55	0.59	
37	Portugal (2014)	14.90	43.95	0.58	
38	Hungary	14.82	43.71	0.57	
39	Chile	14.54	42.88	0.56	
40	Georgia	14.50	42.78	0.55	
41	Philippines (2011)	14.09	41.56	0.53	
42	Moldova, Rep.	13.95	41.13	0.52	
43	Germany	13.91	41.03	0.51	○
44	Peru	13.89	40.98	0.50	
45	Croatia	13.76	40.58	0.49	
46	Uruguay	13.58	40.04	0.48	
47	Colombia	13.16	38.81	0.47	
48	Costa Rica	13.16	38.80	0.45	
49	Azerbaijan	12.87	37.94	0.44	
50	Dominican Republic	12.52	36.93	0.43	
51	Paraguay	12.43	36.66	0.42	
52	Serbia	12.22	36.02	0.41	
53	Malta	12.21	35.99	0.40	○
54	Hong Kong (China)	12.17	35.88	0.38	○
55	Slovakia	11.86	34.95	0.37	
56	TFYR of Macedonia	11.44	33.73	0.36	
57	Kyrgyzstan	10.81	31.85	0.35	
58	Italy	10.62	31.30	0.34	○
59	Czech Republic	10.58	31.16	0.33	○
60	Malaysia	10.47	30.85	0.31	○
61	Ecuador	10.41	30.67	0.30	
62	Austria	10.31	30.37	0.29	○
63	South Africa	10.27	30.25	0.28	○
64	Romania	9.82	28.93	0.27	○
65	Botswana (2010)	9.16	26.97	0.26	
66	Albania	9.03	26.59	0.24	
67	Brazil (2012)	8.32	24.49	0.23	○
68	Mexico	8.16	24.01	0.22	○
69	Sri Lanka (2012)	7.58	22.29	0.21	
70	Thailand	7.55	22.20	0.20	○
71	Turkey (2014)	7.37	21.69	0.19	
72	Mauritius (2010)	7.35	21.63	0.17	○
73	Viet Nam	6.22	18.26	0.16	○
74	Ethiopia (2012)	6.02	17.69	0.15	
75	Egypt	5.51	16.19	0.14	
76	Qatar	4.50	13.19	0.13	
77	Algeria (2010)	4.41	12.93	0.12	
78	Saudi Arabia (2009)	4.39	12.85	0.10	○
79	Indonesia	3.94	11.53	0.09	
80	Guatemala	3.52	10.30	0.08	
81	Uganda	2.71	7.90	0.07	○
82	Madagascar (2012)	2.31	6.72	0.06	
83	Bhutan	1.12	3.18	0.05	○
84	Senegal (2011)	0.74	2.05	0.03	○
85	Tanzania, United Rep.	0.67	1.86	0.02	○
86	Mozambique (2012)	0.51	1.39	0.01	○
87	El Salvador	0.04	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	China	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	India	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Kenya	n/a	n/a	n/a	
n/a	Korea, Rep.	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Morocco	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Pakistan	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Tunisia	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	United States of America	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: International Labour Organization (ILO), ILOSTAT Annual Indicators (2009–2014) and Statistics Canada, Table 282-0004.

NOTE: ● indicates a strength; ○ a weakness

5.2.1 University/industry research collaboration

Average answer to the survey question: In your country, to what extent do businesses and universities collaborate on research and development (R&D)? [1 = do not collaborate at all; 7 = collaborate extensively] | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Finland	5.97	82.80	1.00	●
2	United States of America	5.85	80.83	0.99	●
3	Switzerland	5.79	79.83	0.98	●
4	United Kingdom	5.67	77.76	0.98	●
5	Singapore	5.58	76.29	0.97	
6	Belgium	5.58	76.29	0.96	●
7	Israel	5.50	75.08	0.95	
8	Qatar	5.44	73.96	0.95	●
9	Netherlands	5.38	72.99	0.94	
10	Germany	5.34	72.25	0.93	
11	Sweden	5.33	72.12	0.92	
12	Malaysia	5.33	72.10	0.92	●
13	Ireland	5.24	70.71	0.91	
14	Norway	5.02	66.98	0.90	
15	Japan	5.00	66.74	0.89	
16	New Zealand	4.91	65.10	0.89	
17	Luxembourg	4.90	65.05	0.88	
18	Canada	4.90	65.01	0.87	
19	Denmark	4.90	64.96	0.86	
20	Australia	4.84	64.06	0.86	
21	United Arab Emirates	4.72	62.07	0.85	
22	Portugal	4.68	61.38	0.84	
23	Austria	4.68	61.30	0.83	
24	Iceland	4.62	60.32	0.83	
25	Korea, Rep.	4.62	60.27	0.82	
26	Lithuania	4.61	60.11	0.81	
27	Hong Kong (China)	4.59	59.78	0.80	
28	France	4.58	59.72	0.80	
29	Indonesia	4.55	59.12	0.79	●
30	South Africa	4.49	58.11	0.78	
31	China	4.40	56.69	0.77	
32	Costa Rica	4.36	55.96	0.77	
33	Estonia	4.36	55.92	0.76	
34	Hungary	4.27	54.56	0.75	
35	Kenya	4.22	53.62	0.74	●
36	Saudi Arabia	4.20	53.33	0.73	
37	Chile	4.20	53.32	0.73	
38	Cyprus	4.19	53.18	0.72	
39	Panama	4.04	50.63	0.71	
40	Czech Republic	4.00	50.00	0.70	
41	Barbados	4.00	49.95	0.70	
42	Mexico	3.97	49.52	0.69	
43	Slovenia	3.96	49.26	0.68	
44	Thailand	3.95	49.23	0.67	
45	Montenegro	3.95	49.13	0.67	
46	Honduras	3.94	49.05	0.66	●
47	Colombia	3.93	48.77	0.65	
48	India	3.87	47.85	0.64	
49	Malta	3.86	47.59	0.64	
50	Jordan	3.82	47.07	0.63	
51	El Salvador	3.81	46.84	0.62	
52	Brazil	3.80	46.65	0.61	
53	Philippines	3.79	46.57	0.61	
54	Jamaica	3.79	46.56	0.60	
55	Spain	3.77	46.19	0.59	
56	Guyana	3.76	45.95	0.58	●
57	Italy	3.73	45.47	0.58	
58	TFYR of Macedonia	3.71	45.18	0.57	
59	Turkey	3.69	44.78	0.56	
60	Uganda	3.68	44.69	0.55	
61	Latvia	3.67	44.55	0.55	
62	Rwanda	3.65	44.20	0.54	
63	Senegal	3.64	43.96	0.53	
64	Argentina	3.64	43.92	0.52	
65	Russian Federation	3.63	43.87	0.52	
66	Guatemala	3.62	43.63	0.51	
67	Oman	3.62	43.58	0.50	
68	Uruguay	3.59	43.21	0.49	
69	Romania	3.59	43.16	0.48	
70	Bolivia, Plurinational St.	3.54	42.28	0.48	
71	Poland	3.50	41.73	0.47	
72	Ukraine	3.50	41.71	0.46	
73	Zambia	3.48	41.36	0.45	
74	Ghana	3.46	40.96	0.45	
75	Ethiopia	3.46	40.96	0.44	
76	Namibia	3.46	40.95	0.43	
77	Seychelles	3.40	40.03	0.42	
78	Croatia	3.39	39.86	0.42	
79	Cameroon	3.37	39.56	0.41	
80	Tanzania, United Rep.	3.37	39.47	0.40	
81	Slovakia	3.36	39.31	0.39	
82	Swaziland	3.35	39.08	0.39	
83	Côte d'Ivoire	3.34	38.99	0.38	
84	Gambia	3.33	38.90	0.37	
85	Kazakhstan	3.29	38.24	0.36	
86	Mozambique	3.28	38.04	0.36	
87	Bahrain	3.27	37.90	0.35	
88	Tajikistan	3.27	37.89	0.34	
89	Viet Nam	3.27	37.84	0.33	
90	Madagascar	3.26	37.62	0.33	
91	Dominican Republic	3.25	37.57	0.32	
92	Serbia	3.24	37.35	0.31	
93	Morocco	3.23	37.21	0.30	
94	Cabo Verde	3.22	36.95	0.30	
95	Pakistan	3.21	36.87	0.29	
96	Lesotho	3.20	36.67	0.28	
97	Mali	3.20	36.66	0.27	
98	Mauritius	3.19	36.49	0.27	
99	Iran, Islamic Rep.	3.18	36.35	0.26	
100	Burkina Faso	3.17	36.14	0.25	
101	Azerbaijan	3.16	35.95	0.24	
102	Botswana	3.14	35.74	0.23	
103	Trinidad and Tobago	3.14	35.59	0.23	
104	Venezuela, Bolivarian Rep.	3.13	35.45	0.22	
105	Kuwait	3.10	35.06	0.21	
106	Peru	3.10	34.97	0.20	
107	Sri Lanka	3.08	34.61	0.20	
108	Greece	3.06	34.35	0.19	○
109	Armenia	3.05	34.20	0.18	○
110	Bulgaria	3.00	33.33	0.17	○
111	Mongolia	2.99	33.10	0.17	○
112	Cambodia	2.98	32.95	0.16	
113	Nicaragua	2.95	32.55	0.15	
114	Tunisia	2.92	32.01	0.14	○
115	Lebanon	2.88	31.39	0.14	○
116	Malawi	2.84	30.66	0.13	
117	Zimbabwe	2.82	30.41	0.12	
118	Burundi	2.78	29.75	0.11	
119	Nigeria	2.75	29.20	0.11	
120	Moldova, Rep.	2.74	28.99	0.10	○
121	Paraguay	2.70	28.29	0.09	
122	Bhutan	2.68	28.08	0.08	
123	Nepal	2.64	27.34	0.08	○
124	Georgia	2.64	27.28	0.07	○
125	Kyrgyzstan	2.57	26.19	0.06	○
126	Bangladesh	2.56	25.96	0.05	
127	Egypt	2.43	23.78	0.05	○
128	Albania	2.34	22.32	0.04	○
129	Algeria	2.26	21.07	0.03	○
130	Myanmar	2.25	20.82	0.02	
131	Guinea	2.18	19.72	0.02	○
132	Angola	2.01	16.88	0.01	○
133	Yemen	1.95	15.89	0.00	○
n/a	Belarus	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	

SOURCE: World Economic Forum, *Executive Opinion Survey 2014–2015*

NOTE: ● indicates a strength; ○ a weakness

5.2.2 State of cluster development

Average answer to the survey question on the role of clusters in the economy: In your country, how widespread are well-developed and deep clusters (geographic concentrations of firms, suppliers, producers of related products and services, and specialized institutions in a particular field)? [1 = non-existent; 7 = widespread in many fields] | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Italy	5.60	76.64	1.00	●
2	Germany	5.49	74.86	0.99	●
3	United Arab Emirates	5.49	74.83	0.98	●
4	United States of America	5.42	73.65	0.98	
5	Switzerland	5.35	72.53	0.97	
6	Netherlands	5.35	72.42	0.96	●
7	Japan	5.28	71.39	0.95	
8	Malaysia	5.28	71.29	0.95	●
9	United Kingdom	5.23	70.56	0.94	
10	Qatar	5.21	70.21	0.93	●
11	Singapore	5.13	68.81	0.92	
12	Finland	5.06	67.73	0.92	
13	Norway	5.06	67.66	0.91	
14	Hong Kong (China)	5.00	66.67	0.90	
15	Austria	4.95	65.82	0.89	
16	Luxembourg	4.85	64.18	0.89	
17	Ireland	4.80	63.33	0.88	
18	Canada	4.77	62.89	0.87	
19	Sweden	4.74	62.32	0.86	
20	Belgium	4.70	61.61	0.86	
21	Saudi Arabia	4.66	61.00	0.85	●
22	Brazil	4.63	60.44	0.84	●
23	China	4.56	59.30	0.83	
24	Indonesia	4.53	58.81	0.83	●
25	India	4.50	58.38	0.82	●
26	Israel	4.50	58.31	0.81	
27	Jordan	4.49	58.14	0.80	●
28	El Salvador	4.48	58.05	0.80	●
29	Korea, Rep.	4.35	55.78	0.79	
30	France	4.34	55.65	0.78	
31	Bahrain	4.34	55.60	0.77	
32	Denmark	4.31	55.15	0.77	
33	Mauritius	4.29	54.80	0.76	
34	Turkey	4.28	54.73	0.75	
35	Egypt	4.27	54.53	0.74	●
36	Costa Rica	4.24	53.93	0.73	
37	Thailand	4.20	53.28	0.73	
38	Kenya	4.20	53.26	0.72	
39	Portugal	4.19	53.20	0.71	
40	Australia	4.18	53.05	0.70	
41	South Africa	4.16	52.71	0.70	
42	Mexico	4.15	52.45	0.69	
43	Zambia	4.11	51.86	0.68	●
44	Czech Republic	4.06	51.04	0.67	
45	Honduras	4.06	50.92	0.67	●
46	Malta	4.04	50.72	0.66	
47	Cyprus	4.04	50.72	0.65	
48	Philippines	4.03	50.53	0.64	
49	Panama	4.02	50.29	0.64	
50	New Zealand	4.01	50.09	0.63	
51	Oman	3.99	49.77	0.62	
52	Spain	3.98	49.71	0.61	
53	Mali	3.95	49.16	0.61	●
54	Guatemala	3.94	49.06	0.60	
55	Pakistan	3.94	49.00	0.59	●
56	Rwanda	3.93	48.88	0.58	
57	Iceland	3.92	48.69	0.58	
58	Chile	3.90	48.38	0.57	
59	Guyana	3.90	48.33	0.56	●
60	Seychelles	3.89	48.11	0.55	
61	Cambodia	3.86	47.74	0.55	●
62	Lesotho	3.85	47.53	0.54	●
63	Bangladesh	3.85	47.47	0.53	
64	Sri Lanka	3.84	47.25	0.52	
65	Namibia	3.81	46.81	0.52	
66	Slovakia	3.80	46.73	0.51	
67	Romania	3.78	46.40	0.50	
68	Morocco	3.78	46.27	0.49	
69	Nigeria	3.77	46.20	0.48	●
70	Gambia	3.77	46.12	0.48	●
71	Barbados	3.77	46.10	0.47	
72	Viet Nam	3.76	45.97	0.46	
73	Estonia	3.73	45.56	0.45	○
74	Ghana	3.73	45.48	0.45	
75	Colombia	3.71	45.15	0.44	
76	Malawi	3.69	44.83	0.43	
77	Dominican Republic	3.68	44.69	0.42	
78	Kuwait	3.67	44.54	0.42	
79	Jamaica	3.67	44.45	0.41	
80	Bhutan	3.58	42.94	0.40	
81	Trinidad and Tobago	3.56	42.60	0.39	
82	Mozambique	3.55	42.47	0.39	
83	Uganda	3.53	42.08	0.38	
84	Cameroon	3.52	41.94	0.37	
85	Tunisia	3.51	41.78	0.36	
86	Lithuania	3.50	41.67	0.36	
87	Latvia	3.50	41.67	0.35	○
88	Hungary	3.49	41.54	0.34	
89	Poland	3.48	41.40	0.33	
90	Uruguay	3.47	41.12	0.33	
91	Bolivia, Plurinational St.	3.46	40.97	0.32	
92	TFYR of Macedonia	3.46	40.96	0.31	
93	Slovenia	3.43	40.43	0.30	○
94	Iran, Islamic Rep.	3.42	40.37	0.30	
95	Tanzania, United Rep.	3.42	40.28	0.29	
96	Azerbaijan	3.40	40.08	0.28	
97	Swaziland	3.37	39.52	0.27	
98	Cabo Verde	3.36	39.38	0.27	
99	Nepal	3.35	39.10	0.26	
100	Senegal	3.33	38.85	0.25	
101	Botswana	3.32	38.71	0.24	
102	Algeria	3.32	38.64	0.23	
103	Tajikistan	3.32	38.59	0.23	
104	Lebanon	3.28	37.93	0.22	
105	Peru	3.26	37.75	0.21	
106	Côte d'Ivoire	3.26	37.59	0.20	
107	Nicaragua	3.25	37.45	0.20	
108	Yemen	3.23	37.13	0.19	
109	Georgia	3.23	37.09	0.18	○
110	Armenia	3.22	36.95	0.17	○
111	Serbia	3.19	36.45	0.17	○
112	Kazakhstan	3.17	36.22	0.16	
113	Croatia	3.16	36.06	0.15	○
114	Russian Federation	3.13	35.56	0.14	○
115	Argentina	3.12	35.34	0.14	
116	Paraguay	3.06	34.35	0.13	
117	Montenegro	3.03	33.85	0.12	○
118	Guinea	3.02	33.75	0.11	
119	Greece	3.01	33.44	0.11	○
120	Albania	3.00	33.40	0.10	○
121	Ethiopia	3.00	33.30	0.09	
122	Ukraine	3.00	33.27	0.08	○
123	Bulgaria	2.96	32.60	0.08	○
124	Kyrgyzstan	2.95	32.57	0.07	○
125	Zimbabwe	2.95	32.43	0.06	
126	Burkina Faso	2.90	31.62	0.05	○
127	Madagascar	2.87	31.09	0.05	○
128	Mongolia	2.85	30.79	0.04	○
129	Burundi	2.73	28.88	0.03	
130	Myanmar	2.69	28.16	0.02	
131	Angola	2.58	26.34	0.02	○
132	Venezuela, Bolivarian Rep.	2.40	23.32	0.01	○
133	Moldova, Rep.	2.39	23.24	0.00	○
n/a	Belarus	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	

SOURCE: World Economic Forum, *Executive Opinion Survey 2014–2015*
NOTE: ● indicates a strength; ○ a weakness

5.2.3 GERD financed by abroad

GERD: Financed by abroad (% of total GERD) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Mozambique (2010)	78.14	100.00	1.00	●
2	Burkina Faso (2009)	59.61	76.22	0.99	●
3	Uganda (2010)	57.30	73.26	0.98	●
4	Latvia	51.58	65.92	0.97	●
5	Guatemala (2012)	49.01	62.62	0.96	●
6	Israel (2012)	48.77	62.32	0.95	
7	Bosnia and Herzegovina (2012)	48.67	62.19	0.94	●
8	Bulgaria	48.31	61.73	0.93	●
9	Kenya (2010)	47.14	60.22	0.92	●
10	Tanzania, United Rep. (2010)	42.00	53.63	0.91	●
11	Senegal (2010)	40.53	51.74	0.90	●
12	Burundi (2008)	39.92	50.95	0.89	●
13	Lithuania	37.13	47.37	0.88	●
14	Ghana (2010)	31.22	39.79	0.87	●
15	Bahrain	30.44	38.80	0.86	●
16	Czech Republic	27.15	34.57	0.85	
17	Ukraine	21.61	27.46	0.84	●
18	Ireland (2012)	21.36	27.13	0.82	
19	Panama (2011)	20.73	26.34	0.81	●
20	United Kingdom	20.65	26.22	0.80	
21	Luxembourg (2011)	20.41	25.92	0.79	
22	Malta	20.22	25.68	0.78	
23	Slovakia	17.97	22.78	0.77	
24	Chile (2012)	17.54	22.23	0.76	
25	Cyprus (2012)	17.48	22.17	0.75	
26	Hungary	16.57	20.99	0.74	
27	Austria (2014)	16.38	20.75	0.73	
28	Gambia (2011)	15.90	20.13	0.72	●
29	Romania	15.50	19.63	0.71	
30	Croatia	15.50	19.62	0.70	
31	Montenegro (2011)	15.29	19.35	0.69	
32	Netherlands	14.27	18.05	0.68	
33	Greece	13.32	16.82	0.67	
34	Poland	13.12	16.56	0.66	
35	South Africa (2012)	13.06	16.49	0.65	
36	Belgium (2011)	12.96	16.36	0.64	
37	Switzerland (2012)	12.07	15.23	0.63	
38	Togo (2012)	12.06	15.20	0.62	●
39	Moldova, Rep.	11.80	14.87	0.61	
40	Finland	11.54	14.54	0.60	
41	Madagascar (2009)	10.58	13.31	0.59	●
42	Estonia	10.35	13.01	0.58	
43	Italy (2012)	9.45	11.86	0.57	
44	Serbia (2012)	9.19	11.52	0.56	
45	El Salvador (2012)	9.15	11.48	0.55	
46	Slovenia	8.91	11.17	0.54	
47	Mali (2010)	8.81	11.03	0.53	
48	Iceland (2011)	8.22	10.28	0.52	
49	Belarus	7.95	9.93	0.51	
50	Norway (2011)	7.79	9.72	0.49	○
51	Paraguay (2012)	7.71	9.63	0.48	
52	Uruguay (2012)	7.65	9.54	0.47	
53	France (2012)	7.62	9.50	0.46	○
54	Albania (2008)	7.37	9.18	0.45	
55	Denmark	7.18	8.94	0.44	○
56	Sweden	6.80	8.46	0.43	○
57	Spain (2012)	6.65	8.26	0.42	○
58	Costa Rica (2011)	6.54	8.13	0.41	
59	Mauritius (2012)	6.43	7.99	0.40	
60	New Zealand (2011)	6.32	7.85	0.39	○
61	Canada	5.95	7.37	0.38	○
62	Singapore (2012)	5.91	7.31	0.37	○
63	Portugal (2012)	5.17	6.37	0.36	○
64	Mongolia	4.90	6.01	0.35	
65	Hong Kong (China) (2012)	4.65	5.70	0.34	○
66	Malaysia (2012)	4.59	5.63	0.33	○
67	Ecuador (2011)	4.46	5.46	0.32	
68	Tunisia (2012)	4.40	5.38	0.31	
69	Germany (2012)	4.32	5.28	0.30	○
70	Philippines (2007)	4.12	5.02	0.29	
71	Viet Nam (2011)	3.99	4.86	0.28	
72	United States of America (2012)	3.80	4.61	0.27	○
73	Lesotho (2011)	3.45	4.15	0.26	
74	Russian Federation	3.03	3.62	0.25	○
75	Armenia	2.79	3.32	0.24	
76	Sri Lanka (2010)	2.72	3.23	0.23	
77	Thailand (2011)	2.50	2.94	0.22	○
78	Qatar (2012)	2.42	2.84	0.21	
79	Colombia	2.38	2.79	0.20	○
80	Ethiopia	2.15	2.49	0.19	
81	Bolivia, Plurinational St. (2009)	1.86	2.12	0.18	
82	Morocco (2010)	1.71	1.93	0.16	○
83	Zambia (2008)	1.62	1.81	0.15	
84	Australia (2008)	1.61	1.80	0.14	○
85	Namibia (2010)	1.53	1.70	0.13	○
86	Pakistan	1.31	1.41	0.12	
87	Kuwait (2009)	1.18	1.24	0.11	○
88	Nigeria (2007)	1.04	1.06	0.10	
89	China	0.89	0.88	0.09	○
90	Kyrgyzstan (2011)	0.87	0.85	0.08	
91	Turkey	0.83	0.80	0.07	○
92	Kazakhstan	0.76	0.70	0.06	○
93	Mexico	0.66	0.58	0.05	○
94	Argentina (2012)	0.58	0.48	0.04	○
95	Japan	0.52	0.40	0.03	○
96	Korea, Rep.	0.30	0.12	0.02	○
97	Azerbaijan	0.25	0.05	0.01	○
98	Tajikistan	0.21	0.00	0.00	○
n/a	Algeria	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Brazil	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Egypt	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Georgia	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	India	n/a	n/a	n/a	
n/a	Indonesia	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Peru	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	TFYR of Macedonia	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*

NOTE: ● indicates a strength; ○ a weakness

5.2.4 Joint venture/strategic alliance deals

Joint ventures/strategic alliances: Number of deals, fractional counting (per trillion PPP$ GDP) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Bahrain	0.15	100.00	0.99	●
1	United Arab Emirates	0.07	100.00	0.99	●
3	Luxembourg	0.06	89.66	0.98	●
4	Canada	0.06	87.84	0.97	●
5	Singapore	0.05	73.70	0.96	
6	Ireland	0.05	69.86	0.94	
7	New Zealand	0.05	69.15	0.93	
8	Mauritius	0.04	65.59	0.92	●
9	Hong Kong (China)	0.04	65.52	0.91	
10	Australia	0.04	64.08	0.90	
11	Qatar	0.04	62.90	0.89	●
12	Switzerland	0.04	58.24	0.88	
13	Oman	0.04	56.51	0.87	●
14	Israel	0.04	56.01	0.85	
15	Cyprus	0.04	55.77	0.84	
16	United States of America	0.04	53.88	0.83	
17	Greece	0.03	52.85	0.82	
18	United Kingdom	0.03	47.63	0.81	
19	Georgia	0.03	44.55	0.80	●
20	Mongolia	0.03	43.83	0.79	
21	Lebanon	0.02	37.46	0.78	●
22	Zambia	0.02	37.33	0.76	●
23	Malaysia	0.02	36.64	0.75	
24	Jordan	0.02	34.93	0.74	●
25	Norway	0.02	34.42	0.73	
26	Tajikistan	0.02	33.96	0.72	●
27	Sweden	0.02	33.82	0.71	
28	Namibia	0.02	32.11	0.70	●
29	Kuwait	0.02	31.99	0.69	●
30	Saudi Arabia	0.02	31.10	0.67	
31	Denmark	0.02	30.30	0.66	
32	Zimbabwe	0.02	27.81	0.65	●
33	Mali	0.02	27.63	0.64	●
34	Netherlands	0.02	26.91	0.63	○
35	Croatia	0.02	25.52	0.62	
36	Mozambique	0.02	24.17	0.61	●
37	Botswana	0.01	22.22	0.60	
38	Japan	0.01	22.16	0.58	
39	Honduras	0.01	19.08	0.57	●
40	Belgium	0.01	18.57	0.56	
41	Korea, Rep.	0.01	18.42	0.55	
42	Egypt	0.01	17.88	0.54	
43	France	0.01	17.37	0.53	○
44	Finland	0.01	16.78	0.52	
45	Chile	0.01	16.29	0.51	
46	Philippines	0.01	15.67	0.49	
47	Thailand	0.01	15.11	0.48	
48	Estonia	0.01	13.76	0.47	○
49	Germany	0.01	13.55	0.46	○
50	Spain	0.01	12.70	0.45	○
51	India	0.01	12.18	0.44	
52	Nepal	0.01	10.86	0.43	
53	South Africa	0.01	10.62	0.42	
54	Latvia	0.01	9.98	0.40	○
55	Panama	0.01	9.40	0.39	
56	Russian Federation	0.01	9.19	0.38	
57	China	0.01	9.15	0.37	
58	Colombia	0.01	8.94	0.36	
59	Myanmar	0.01	8.86	0.35	●
60	Uzbekistan	0.01	8.29	0.34	
61	Belarus	0.01	8.27	0.33	
62	Italy	0.01	7.51	0.31	○
63	Serbia	0.01	7.37	0.30	○
64	Austria	0.01	7.10	0.29	○
65	Czech Republic	0.00	6.65	0.28	○
66	Sri Lanka	0.00	6.39	0.27	
67	Viet Nam	0.00	6.34	0.26	
68	Lithuania	0.00	5.75	0.25	○
69	Hungary	0.00	5.55	0.24	○
70	Morocco	0.00	5.40	0.22	
71	Tanzania, United Rep.	0.00	5.36	0.21	
72	Kenya	0.00	5.11	0.20	
73	Bangladesh	0.00	5.07	0.19	
74	Dominican Republic	0.00	4.88	0.18	
75	Brazil	0.00	4.80	0.17	○
76	Poland	0.00	4.13	0.16	○
77	Ghana	0.00	4.03	0.15	
78	Azerbaijan	0.00	3.95	0.13	○
79	Pakistan	0.00	3.65	0.12	
80	Ukraine	0.00	3.44	0.11	○
81	Turkey	0.00	3.11	0.10	○
82	Mexico	0.00	2.40	0.09	○
83	Portugal	0.00	2.02	0.08	○
84	Indonesia	0.00	1.77	0.07	○
85	Argentina	0.00	1.71	0.06	○
86	Peru	0.00	1.35	0.04	○
87	Algeria	0.00	1.13	0.03	
88	Venezuela, Bolivarian Rep.	0.00	0.70	0.02	○
89	Iran, Islamic Rep.	0.00	0.42	0.01	○
90	Nigeria	0.00	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Armenia	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Bulgaria	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Costa Rica	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Iceland	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Kazakhstan	n/a	n/a	n/a	
n/a	Kyrgyzstan	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Malta	n/a	n/a	n/a	
n/a	Moldova, Rep.	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Romania	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Slovakia	n/a	n/a	n/a	
n/a	Slovenia	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	TFYR of Macedonia	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Tunisia	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	
n/a	Uruguay	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	

SOURCE: Thomson Reuters, *Thomson One Banker Private Equity, SDC Platinum* database; International Monetary Fund *World Economic Outlook Database, 2015* (PPP$ GDP)

NOTE: ● indicates a strength; ○ a weakness

5.2.5 Patent families filed in at least three offices

Number of patent families filed by residents in at least three offices (per billion PPP$ GDP) | 2011

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Barbados	6.71	100.00	1.00	●
2	Japan	5.15	93.83	0.99	●
3	Korea, Rep.	4.39	90.12	0.98	●
4	Switzerland	3.35	83.81	0.97	
5	Israel	3.04	81.62	0.96	●
6	Finland	2.48	76.92	0.96	
7	Germany	2.37	75.93	0.95	
8	Seychelles (2010)	2.23	74.55	0.94	●
9	Sweden	1.90	70.86	0.93	
10	Luxembourg	1.71	68.50	0.92	
11	United States of America	1.50	65.55	0.91	
12	Austria	1.40	63.98	0.90	●
13	Netherlands	1.29	62.19	0.89	
14	France	1.23	61.25	0.88	
15	Denmark	1.10	58.81	0.88	
16	Canada	1.04	57.51	0.87	
17	United Kingdom	0.92	54.84	0.86	
18	Belgium	0.83	52.70	0.85	
19	Singapore	0.79	51.52	0.84	
20	Australia	0.75	50.46	0.83	
21	Malta	0.73	49.94	0.82	
22	Ireland	0.64	47.23	0.81	
23	Norway	0.54	43.83	0.81	
24	Italy	0.47	41.02	0.80	
25	New Zealand	0.46	40.50	0.79	
26	Cyprus	0.35	35.23	0.78	
27	Iceland	0.31	33.52	0.77	
28	Estonia	0.29	31.94	0.76	
29	China	0.28	31.19	0.75	
30	Hong Kong (China)	0.27	30.55	0.74	
31	Burundi (2004)	0.22	27.70	0.73	●
32	Czech Republic	0.21	26.73	0.73	
33	Spain	0.18	24.56	0.72	
34	Slovenia	0.17	23.36	0.71	
35	Mauritius (2009)	0.17	22.99	0.70	
36	Swaziland (2009)	0.14	20.15	0.69	●
37	Moldova, Rep.	0.13	20.05	0.68	
38	Hungary	0.13	19.84	0.67	
39	Montenegro (2010)	0.12	18.57	0.66	
40	Mongolia (2008)	0.12	18.30	0.65	
41	Portugal	0.10	16.27	0.65	
42	Guinea (2009)	0.08	14.04	0.64	●
43	Latvia (2009)	0.08	13.41	0.63	
44	Namibia (2005)	0.08	13.19	0.62	
45	Niger	0.07	12.89	0.61	●
46	Georgia	0.07	12.55	0.60	
47	Panama	0.07	12.45	0.59	
48	Kyrgyzstan (2009)	0.07	12.14	0.58	
49	Poland	0.07	12.04	0.58	
50	Albania (2004)	0.06	10.53	0.57	
51	Armenia (2010)	0.05	9.98	0.56	
52	India	0.05	9.86	0.55	
53	Slovakia	0.05	9.64	0.54	
54	Bulgaria	0.05	9.60	0.53	
55	Croatia	0.05	8.84	0.52	
56	Malaysia	0.04	8.64	0.51	
57	Jamaica	0.04	8.50	0.50	
58	Lithuania	0.04	8.49	0.50	
59	Jordan	0.04	8.39	0.49	
60	Sri Lanka	0.04	7.12	0.48	
61	Argentina	0.03	6.97	0.47	
62	Serbia	0.03	6.66	0.46	
63	Brazil	0.03	6.50	0.45	
64	Russian Federation	0.03	6.00	0.44	
65	Lebanon (2010)	0.03	5.90	0.43	
66	Mexico	0.03	5.69	0.42	
67	Greece	0.03	5.55	0.42	
68	Trinidad and Tobago (2009)	0.03	5.42	0.41	
69	South Africa	0.03	5.28	0.40	
70	Bolivia, Plurinational St. (2006)	0.02	5.10	0.39	
71	Saudi Arabia	0.02	5.07	0.38	
72	El Salvador (2009)	0.02	4.91	0.37	
73	Cameroon (2006)	0.02	4.85	0.36	
74	Oman (2005)	0.02	4.81	0.35	
75	Bahrain (2008)	0.02	4.65	0.35	
76	Belarus (2010)	0.02	4.38	0.34	
77	Philippines	0.02	4.32	0.33	
78	Romania	0.02	4.28	0.32	
79	Ecuador	0.02	4.26	0.31	
80	Tunisia (2010)	0.02	3.95	0.30	
81	Turkey	0.02	3.78	0.29	
82	Uruguay	0.02	3.63	0.28	
83	Costa Rica	0.02	3.61	0.27	
84	Kenya (2004)	0.02	3.32	0.27	
85	Chile	0.01	3.14	0.26	○
86	Dominican Republic (2006)	0.01	2.66	0.25	
87	Guatemala (2007)	0.01	2.56	0.24	
88	Ukraine	0.01	2.35	0.23	
89	Uzbekistan (2008)	0.01	2.28	0.22	
90	Thailand	0.01	2.10	0.21	○
91	Azerbaijan (2009)	0.01	1.73	0.20	
92	Myanmar (2008)	0.01	1.50	0.19	
93	United Arab Emirates	0.01	1.36	0.19	○
94	Colombia	0.01	1.28	0.18	○
95	Morocco (2009)	0.01	1.18	0.17	○
96	Viet Nam	0.00	1.10	0.16	○
97	Qatar (2010)	0.00	1.03	0.15	
98	Kazakhstan (2006)	0.00	0.95	0.14	○
99	Kuwait	0.00	0.93	0.13	
100	Venezuela, Bolivarian Rep.	0.00	0.92	0.12	
101	Peru (2010)	0.00	0.81	0.12	○
102	Nigeria (2010)	0.00	0.58	0.11	
103	Algeria (2010)	0.00	0.51	0.10	
104	Pakistan (2006)	0.00	0.40	0.09	
105	Indonesia (2010)	0.00	0.35	0.08	○
106	Egypt	0.00	0.28	0.07	○
107	Iran, Islamic Rep. (2009)	0.00	0.20	0.06	○
108	Bangladesh	0.00	0.00	0.00	○
108	Botswana	0.00	0.00	0.00	○
108	Côte d'Ivoire	0.00	0.00	0.00	○
108	Ghana	0.00	0.00	0.00	○
108	Nicaragua	0.00	0.00	0.00	○
108	TFYR of Macedonia	0.00	0.00	0.00	○
108	Zimbabwe	0.00	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	

SOURCE: World Intellectual Property Organization, *WIPO Statistics Database*; International Monetary Fund *World Economic Outlook Database*, 2015 (PPP$ GDP)

NOTE: ● indicates a strength; ○ a weakness

5.3.1 Royalties and license fees payments

Royalty and license fees, payments (% of total trade) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Guyana	3.39	100.00	0.97	●
1	Ireland	22.21	100.00	0.97	●
1	Netherlands	4.18	100.00	0.97	●
1	Singapore	3.78	100.00	0.97	●
1	Switzerland (2012)	8.39	100.00	0.97	●
6	Argentina	2.60	76.53	0.96	●
7	Swaziland (2012)	2.00	58.89	0.95	●
8	Japan	1.99	58.69	0.94	
9	Canada	1.93	56.89	0.94	
10	New Zealand	1.87	54.97	0.93	
11	South Africa	1.70	50.12	0.92	●
12	Thailand	1.64	48.42	0.91	●
13	Finland	1.62	47.84	0.90	
14	United States of America	1.58	46.61	0.90	
15	Russian Federation	1.57	46.34	0.89	●
16	Malta	1.52	44.83	0.88	
17	Korea, Rep.	1.48	43.53	0.87	
18	Iceland (2012)	1.40	41.34	0.86	
19	France	1.27	37.47	0.86	
20	Australia	1.23	36.15	0.85	
21	Brazil	1.22	35.80	0.84	●
22	Ukraine	1.16	34.20	0.83	●
23	Poland	1.11	32.82	0.82	●
24	Hungary	1.11	32.77	0.82	
25	Romania	1.07	31.48	0.81	●
26	United Kingdom	1.05	30.97	0.80	
27	Chile	1.04	30.63	0.79	
28	Serbia	1.03	30.35	0.78	
29	Jamaica	1.02	30.00	0.78	●
30	Denmark	1.00	29.47	0.77	
31	Croatia	0.98	28.98	0.76	
32	Italy	0.97	28.67	0.75	
33	Sweden	0.97	28.43	0.74	
34	Barbados (2010)	0.91	26.79	0.74	
35	China	0.91	26.74	0.73	
36	Luxembourg	0.86	25.25	0.72	
37	Germany	0.84	24.66	0.71	
38	Austria	0.83	24.57	0.70	
39	Colombia	0.83	24.57	0.70	
40	Indonesia	0.83	24.56	0.69	●
41	El Salvador	0.83	24.38	0.68	●
42	India	0.76	22.49	0.67	
43	Slovenia	0.73	21.63	0.66	
44	Philippines	0.73	21.59	0.66	●
45	Belgium	0.72	21.30	0.65	
46	Madagascar (2012)	0.68	20.10	0.64	●
47	Guatemala	0.65	19.22	0.63	●
48	TFYR of Macedonia	0.65	19.10	0.62	
49	Czech Republic	0.64	18.97	0.62	
50	Egypt (2012)	0.59	17.48	0.61	
51	Malaysia	0.58	17.03	0.60	
52	Bulgaria	0.55	16.15	0.59	
53	Israel (2012)	0.54	15.93	0.58	
54	Portugal	0.50	14.68	0.58	
55	Greece	0.48	14.12	0.57	
56	Moldova, Rep.	0.47	13.69	0.56	
57	Peru (2012)	0.46	13.61	0.55	
58	Spain	0.46	13.57	0.54	○
59	Venezuela, Bolivarian Rep. (2012)	0.45	13.31	0.54	
60	Dominican Republic (2012)	0.45	13.17	0.53	
61	Ecuador	0.44	12.89	0.52	
62	Norway	0.40	11.87	0.51	○
63	Albania	0.40	11.86	0.50	
64	Bolivia, Plurinational St. (2012)	0.39	11.51	0.50	
65	Mexico	0.36	10.69	0.49	
66	Hong Kong (China) (2012)	0.36	10.55	0.48	
67	Honduras	0.35	10.44	0.47	
68	Trinidad and Tobago (2011)	0.34	9.89	0.46	
69	Zimbabwe (2012)	0.33	9.85	0.46	
70	Turkey	0.33	9.73	0.45	
71	Pakistan	0.33	9.67	0.44	
72	Costa Rica	0.32	9.42	0.43	
73	Belarus	0.32	9.35	0.42	
74	Cyprus	0.31	9.24	0.42	
75	Nigeria	0.30	8.80	0.41	
76	Panama	0.29	8.49	0.40	
77	Paraguay	0.27	8.04	0.39	
78	Lesotho	0.27	7.80	0.38	
79	Latvia	0.25	7.43	0.38	○
80	Estonia	0.25	7.38	0.37	○
81	Uruguay	0.24	7.01	0.36	
82	Uganda	0.23	6.87	0.35	
83	Kenya (2012)	0.23	6.72	0.34	
84	Mongolia	0.23	6.65	0.34	
85	Algeria (2012)	0.20	5.88	0.33	
86	Kazakhstan	0.20	5.79	0.32	
87	Mauritius	0.19	5.60	0.31	
88	Montenegro	0.19	5.49	0.30	○
89	Morocco	0.18	5.14	0.30	
90	Iran, Islamic Rep. (2012)	0.17	5.11	0.29	
91	Botswana (2012)	0.16	4.76	0.28	
92	Slovakia	0.16	4.75	0.27	○
93	Kyrgyzstan (2012)	0.16	4.73	0.26	
94	Georgia	0.16	4.60	0.26	
95	Côte d'Ivoire (2010)	0.15	4.45	0.25	
96	Seychelles (2012)	0.14	4.22	0.24	
97	Cambodia	0.12	3.37	0.23	
98	Lithuania	0.11	3.30	0.22	○
99	Niger (2009)	0.11	3.22	0.22	
100	Togo (2010)	0.11	3.13	0.21	
101	Azerbaijan (2012)	0.10	3.04	0.20	
102	Mozambique (2012)	0.10	2.82	0.19	
103	Cameroon (2012)	0.10	2.80	0.18	
104	Senegal (2012)	0.09	2.67	0.18	
105	Fiji	0.09	2.66	0.17	
106	Bosnia and Herzegovina	0.08	2.48	0.16	○
107	Lebanon (2012)	0.07	1.96	0.15	○
108	Mali (2010)	0.07	1.92	0.14	
109	Namibia	0.07	1.91	0.14	○
110	Tunisia (2012)	0.05	1.55	0.13	○
111	Rwanda (2012)	0.05	1.50	0.12	
112	Yemen (2011)	0.05	1.38	0.11	
113	Bangladesh (2012)	0.03	0.98	0.10	
114	Ethiopia (2012)	0.02	0.71	0.10	
115	Guinea (2012)	0.02	0.70	0.09	
116	Malawi (2012)	0.02	0.68	0.08	○
117	Tanzania, United Rep.	0.01	0.36	0.07	
118	Nicaragua	0.01	0.35	0.06	○
119	Cabo Verde	0.01	0.32	0.06	○
120	Burkina Faso (2012)	0.01	0.23	0.05	○
121	Zambia (2012)	0.01	0.16	0.04	○
122	Bhutan	0.01	0.15	0.03	○
123	Angola (2012)	0.00	0.12	0.02	
124	Tajikistan (2012)	0.00	0.08	0.02	○
125	Burundi (2012)	0.00	0.08	0.01	○
126	Sudan	0.00	0.00	0.00	○
n/a	Armenia	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Qatar	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Sri Lanka	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Viet Nam	n/a	n/a	n/a	

SOURCE: World Trade Organization, *Trade in Commercial Services* database, based on the International Monetary Fund *Balance of Payments* database

NOTE: ● indicates a strength; ○ a weakness

5.3.2 High-tech imports

High-tech net imports (% of total trade) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Hong Kong (China)	41.48	100.00	0.99	●
1	Malaysia	23.42	100.00	0.99	●
3	Fiji	23.14	98.70	0.98	●
4	Viet Nam	22.04	93.55	0.98	●
5	Costa Rica	20.89	88.21	0.97	●
6	Singapore	20.75	87.54	0.96	
7	Panama (2011)	20.19	84.93	0.95	●
8	China	18.76	78.27	0.95	●
9	Mexico	17.67	73.19	0.94	●
10	United States of America	16.12	65.99	0.93	
11	Paraguay	16.02	65.51	0.92	●
12	Czech Republic	15.65	63.79	0.91	●
13	Colombia	15.63	63.67	0.91	●
14	Slovakia	14.78	59.75	0.90	●
15	Thailand	14.69	59.30	0.89	●
16	Mozambique	14.36	57.78	0.88	●
17	Japan	13.95	55.87	0.88	
18	Hungary	13.82	55.25	0.87	●
19	Malta	13.35	53.08	0.86	
20	Malawi	13.32	52.90	0.85	●
21	Korea, Rep.	12.68	49.93	0.84	
22	Netherlands	12.59	49.54	0.84	
23	Brazil	12.02	46.86	0.83	●
24	Estonia	11.83	45.98	0.82	
25	France	11.56	44.71	0.81	
26	United Kingdom	11.19	42.99	0.80	
27	Kenya	10.90	41.65	0.80	●
28	Rwanda	10.64	40.42	0.79	●
29	Argentina	10.53	39.93	0.78	●
30	Canada	10.23	38.53	0.77	
31	South Africa	10.18	38.29	0.77	
32	Switzerland	9.92	37.10	0.76	
33	Burundi	9.81	36.55	0.75	●
34	El Salvador	9.75	36.28	0.74	●
35	Chile	9.67	35.92	0.73	
36	Ethiopia	9.67	35.92	0.73	●
37	Australia	9.61	35.63	0.72	
38	Belgium	9.61	35.61	0.71	
39	Germany	9.57	35.46	0.70	
40	New Zealand	9.47	34.98	0.70	
41	Bangladesh	9.44	34.82	0.69	●
42	Israel	9.36	34.47	0.68	
43	Ecuador	9.36	34.46	0.67	●
44	Guatemala	9.32	34.26	0.66	●
45	Poland	9.23	33.85	0.66	
46	Sweden	9.20	33.74	0.65	
47	Romania	9.10	33.26	0.64	
48	Sudan	9.02	32.89	0.63	●
49	Austria	8.95	32.55	0.63	
50	Uruguay	8.89	32.27	0.62	
51	Peru	8.77	31.71	0.61	
52	Indonesia	8.36	29.80	0.60	
53	Turkey	8.14	28.77	0.59	
54	Tunisia	8.13	28.74	0.59	
55	Bolivia, Plurinational St.	7.90	27.64	0.58	●
56	Zimbabwe	7.88	27.56	0.57	●
57	Latvia	7.58	26.18	0.56	
58	Croatia	7.58	26.17	0.55	
59	Uganda	7.47	25.65	0.55	
60	Pakistan	7.32	24.96	0.54	●
61	Algeria	7.26	24.67	0.53	●
62	Italy	7.17	24.24	0.52	
63	Russian Federation	7.14	24.13	0.52	
64	Finland	7.12	24.01	0.51	○
65	Moldova, Rep.	6.95	23.25	0.50	
66	Niger	6.92	23.11	0.49	●
67	Mongolia	6.83	22.68	0.48	
68	Tanzania, United Rep.	6.82	22.62	0.48	
69	Kazakhstan	6.82	22.62	0.47	
70	India	6.75	22.30	0.46	
71	Serbia	6.59	21.57	0.45	
72	Egypt	6.52	21.23	0.45	
73	Nicaragua	6.51	21.19	0.44	●
74	Ukraine	6.48	21.06	0.43	
75	Bulgaria	6.34	20.40	0.42	
76	Namibia	6.33	20.35	0.41	
77	Portugal	6.29	20.15	0.41	○
78	Honduras	6.23	19.87	0.40	
79	Denmark	6.17	19.61	0.39	○
80	TFYR of Macedonia	6.14	19.45	0.38	
81	Spain	6.04	19.02	0.38	○
82	Georgia	6.02	18.91	0.37	
83	Saudi Arabia	6.02	18.89	0.36	
84	Nepal	6.00	18.83	0.35	
85	Norway	5.93	18.48	0.34	○
86	Greece	5.84	18.08	0.34	
87	Armenia	5.71	17.46	0.33	
88	Belarus	5.65	17.19	0.32	
89	Dominican Republic	5.52	16.58	0.31	
90	Slovenia	5.50	16.48	0.30	○
91	United Arab Emirates	5.45	16.27	0.30	○
92	Bosnia and Herzegovina	5.35	15.80	0.29	
93	Kyrgyzstan	5.32	15.63	0.28	
94	Sri Lanka	5.30	15.56	0.27	
95	Ireland	5.15	14.83	0.27	○
96	Jordan	5.15	14.83	0.26	
97	Mali	5.10	14.62	0.25	
98	Mauritius	5.08	14.52	0.24	
99	Ghana	5.06	14.43	0.23	
100	Iceland	4.95	13.91	0.23	○
101	Trinidad and Tobago	4.92	13.76	0.22	
102	Montenegro	4.89	13.63	0.21	○
103	Lithuania	4.73	12.89	0.20	○
104	Côte d'Ivoire	4.63	12.45	0.20	
105	Cyprus	4.57	12.14	0.19	○
106	Zambia	4.52	11.92	0.18	
107	Burkina Faso	4.50	11.84	0.17	
108	Cambodia	4.38	11.28	0.16	
109	Bahrain	4.22	10.51	0.16	
110	Madagascar	4.19	10.37	0.15	
111	Iran, Islamic Rep.	4.02	9.59	0.14	
112	Azerbaijan	3.94	9.19	0.13	○
113	Luxembourg	3.89	8.96	0.13	○
114	Kuwait	3.83	8.69	0.12	○
115	Jamaica	3.60	7.60	0.11	○
116	Albania	3.58	7.54	0.10	○
117	Guyana	3.56	7.46	0.09	○
118	Cabo Verde	3.54	7.33	0.09	
119	Bhutan	3.29	6.20	0.08	
120	Yemen	3.24	5.95	0.07	
121	Botswana	3.21	5.80	0.06	○
122	Senegal	3.10	5.28	0.05	○
123	Togo	3.03	4.97	0.05	○
124	Nigeria	2.89	4.33	0.04	○
125	Oman	2.89	4.31	0.03	○
126	Lebanon	2.76	3.70	0.02	○
127	Gambia	2.73	3.59	0.02	○
128	Qatar	2.26	1.40	0.01	○
129	Myanmar	1.96	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Morocco	n/a	n/a	n/a	
n/a	Philippines	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	

SOURCE: United Nations, *COMTRADE* database; Eurostat *'High-technology' aggregations based on SITC Rev. 4;* WTO *Trade in Commercial Services* database

NOTE: ● indicates a strength; ○ a weakness

5.3.3 Communications, computer and information services imports

Communications, computer and information services imports (% of total trade) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Finland	3.40	100.00	0.99	●
1	Niger (2011)	7.82	100.00	0.99	●
3	Gambia (2009)	3.23	95.14	0.98	●
4	Luxembourg	3.20	94.25	0.98	●
5	Madagascar (2012)	2.97	87.34	0.97	●
6	Sweden	2.82	82.86	0.96	●
7	Mali (2012)	2.60	76.20	0.95	●
8	Burkina Faso (2012)	2.47	72.23	0.94	●
9	Togo (2011)	2.18	63.65	0.93	●
10	Uganda	2.16	63.23	0.93	●
11	Cyprus	2.14	62.39	0.92	●
12	Fiji (2012)	2.03	59.32	0.91	●
13	Senegal (2012)	2.03	59.22	0.90	●
14	Estonia	2.02	58.95	0.89	
15	Sri Lanka	2.02	58.80	0.89	●
16	Denmark	2.00	58.35	0.88	
17	Germany	1.96	57.23	0.87	
18	Belgium	1.96	57.01	0.86	
19	Montenegro	1.86	54.26	0.85	●
20	Barbados (2010)	1.86	54.19	0.84	●
21	Moldova, Rep.	1.83	53.12	0.84	●
22	Slovenia	1.81	52.51	0.83	
23	Austria	1.78	51.69	0.82	
24	France	1.78	51.69	0.81	
25	Serbia	1.75	50.80	0.80	●
26	Mongolia	1.74	50.41	0.80	
27	Guyana	1.73	50.28	0.79	●
28	Italy	1.73	50.28	0.78	
29	Brazil	1.73	50.23	0.77	●
30	United Kingdom	1.70	49.31	0.76	
31	Norway	1.69	49.11	0.75	
32	Iceland (2012)	1.67	48.49	0.75	
33	Croatia	1.65	47.93	0.74	
34	Ethiopia (2012)	1.65	47.85	0.73	●
35	TFYR of Macedonia	1.64	47.47	0.72	
36	Albania	1.63	47.32	0.71	●
37	Netherlands	1.57	45.40	0.70	
38	Romania	1.54	44.70	0.70	
39	Czech Republic	1.43	41.28	0.69	
40	Cabo Verde	1.42	40.93	0.68	●
41	United States of America	1.40	40.43	0.67	
42	New Zealand	1.35	38.81	0.66	
43	Malaysia	1.32	38.05	0.66	
44	Latvia	1.31	37.70	0.65	
45	Spain	1.29	37.01	0.64	
46	Portugal	1.28	36.72	0.63	
47	Malta	1.24	35.67	0.62	
48	Israel (2012)	1.24	35.67	0.61	
49	Poland	1.23	35.20	0.61	
50	Mauritius	1.22	35.16	0.60	
51	Argentina	1.21	34.73	0.59	
52	Greece	1.19	34.25	0.58	
53	Russian Federation	1.15	32.83	0.57	
54	Tajikistan (2012)	1.11	31.64	0.57	●
55	Armenia	1.09	31.32	0.56	
56	Lebanon (2012)	1.08	30.85	0.55	
57	Nigeria	1.05	30.01	0.54	●
58	Canada	1.05	29.93	0.53	○
59	Hungary	1.04	29.72	0.52	
60	Pakistan	1.02	29.18	0.52	
61	Ireland	0.95	27.13	0.51	○
62	Jamaica	0.91	25.89	0.50	
63	Trinidad and Tobago (2011)	0.88	25.02	0.49	
64	Angola (2012)	0.87	24.47	0.48	●
65	Bosnia and Herzegovina	0.85	23.87	0.48	
66	Colombia	0.84	23.66	0.47	
67	Chile (2012)	0.83	23.52	0.46	
68	Ukraine	0.83	23.51	0.45	
69	Peru (2012)	0.81	22.78	0.44	
70	Côte d'Ivoire (2010)	0.78	21.83	0.43	●
71	Rwanda (2012)	0.77	21.71	0.43	
72	Egypt (2012)	0.75	21.06	0.42	
73	Indonesia	0.74	20.83	0.41	
74	India	0.74	20.76	0.40	
75	Philippines	0.74	20.72	0.39	
76	Bulgaria	0.73	20.48	0.39	
77	Japan	0.71	19.85	0.38	○
78	Australia	0.69	19.21	0.37	○
79	Mozambique (2012)	0.69	19.16	0.36	
80	Honduras	0.69	19.15	0.35	
81	Lesotho	0.65	18.18	0.34	
82	El Salvador	0.62	17.09	0.34	
83	Bolivia, Plurinational St. (2012)	0.61	16.97	0.33	
84	Costa Rica	0.60	16.62	0.32	
85	Singapore (2008)	0.60	16.53	0.31	○
86	Iran, Islamic Rep. (2012)	0.59	16.21	0.30	
87	Namibia (2011)	0.54	14.70	0.30	
88	Venezuela, Bolivarian Rep. (2012)	0.54	14.63	0.29	
89	Lithuania	0.53	14.49	0.28	○
90	Hong Kong (China) (2012)	0.52	14.31	0.27	○
91	Azerbaijan	0.52	14.29	0.26	
92	Kuwait	0.51	13.89	0.25	
93	Guatemala	0.51	13.73	0.25	
94	Cambodia	0.50	13.54	0.24	
95	Guinea (2012)	0.49	13.42	0.23	●
96	Georgia	0.48	12.87	0.22	
97	Tanzania, United Rep.	0.46	12.49	0.21	
98	Cameroon (2012)	0.45	12.14	0.20	
99	Belarus	0.44	11.76	0.20	○
100	Kyrgyzstan	0.43	11.55	0.19	
101	Kazakhstan	0.43	11.44	0.18	
102	Tunisia (2012)	0.42	11.17	0.17	○
103	Bhutan	0.41	10.96	0.16	
104	Botswana (2012)	0.41	10.87	0.16	
105	Slovakia	0.38	10.05	0.15	○
106	Morocco (2012)	0.38	9.95	0.14	○
107	Uruguay	0.38	9.91	0.13	○
108	Korea, Rep.	0.38	9.85	0.12	○
109	Malawi (2012)	0.37	9.78	0.11	
110	South Africa	0.36	9.41	0.11	○
111	Dominican Republic (2012)	0.36	9.31	0.10	○
112	China	0.33	8.42	0.09	○
113	Yemen (2011)	0.29	7.43	0.08	
114	Panama	0.25	6.24	0.07	○
115	Thailand	0.21	4.88	0.07	○
116	Sudan	0.20	4.73	0.06	
117	Zambia (2012)	0.20	4.70	0.05	○
118	Algeria (2012)	0.20	4.58	0.04	
119	Swaziland (2008)	0.18	4.01	0.03	○
120	Turkey	0.12	2.37	0.02	○
121	Bangladesh (2012)	0.11	1.89	0.02	○
122	Kenya (2012)	0.11	1.82	0.01	○
123	Paraguay	0.04	0.00	0.00	○
n/a	Bahrain	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Mexico	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Qatar	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Switzerland	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Viet Nam	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: World Trade Organization, *Trade in Commercial Services* database, based on the International Monetary Fund *Balance of Payments* database

NOTE: ● indicates a strength; ○ a weakness

5.3.4 Foreign direct investment net inflows

Foreign direct investment (FDI), net inflows (% of GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Hong Kong (China)	27.97	100.00	0.99	●
1	Luxembourg	49.81	100.00	0.99	●
1	Mozambique	42.11	100.00	0.99	●
4	Ireland	22.94	89.37	0.98	●
5	Singapore	21.40	86.14	0.97	
6	Mongolia	18.68	80.37	0.96	●
7	Seychelles	14.01	70.51	0.96	●
8	Barbados (2012)	12.20	66.70	0.95	●
9	Panama	11.84	65.94	0.94	●
10	Albania	11.45	65.12	0.94	●
11	Kyrgyzstan	10.48	63.07	0.93	●
12	Montenegro	10.08	62.23	0.92	●
13	Cambodia	8.82	59.56	0.91	●
14	Niger	8.58	59.06	0.91	●
15	Zambia	8.09	58.02	0.90	●
16	Madagascar	7.76	57.31	0.89	●
17	Nicaragua	7.51	56.79	0.88	●
18	Chile	7.31	56.36	0.88	●
19	Trinidad and Tobago	6.95	55.61	0.87	●
20	Fiji	6.75	55.19	0.86	●
21	Ghana	6.73	55.15	0.86	●
22	Guyana	6.52	54.70	0.85	●
23	Costa Rica	6.52	54.70	0.84	●
24	Lebanon	6.39	54.42	0.83	●
25	Georgia	6.33	54.29	0.83	●
26	Honduras	5.76	53.10	0.82	●
27	Bolivia, Plurinational St.	5.72	53.00	0.81	●
28	Tanzania, United Rep.	5.64	52.83	0.81	●
29	Namibia	5.56	52.67	0.80	●
30	Jordan	5.34	52.21	0.79	●
31	Uganda	5.33	52.19	0.78	●
32	Viet Nam	5.19	51.90	0.78	●
33	Uruguay	5.08	51.66	0.77	●
34	Peru	5.03	51.55	0.76	●
35	Colombia	4.44	50.30	0.76	
36	Kazakhstan	4.34	50.09	0.75	●
37	Israel	4.05	49.48	0.74	
38	Jamaica	4.02	49.41	0.73	●
39	Netherlands	4.01	49.40	0.73	
40	China	3.76	48.88	0.72	
41	Mali	3.75	48.85	0.71	●
42	Estonia	3.72	48.78	0.71	
43	Malaysia	3.71	48.76	0.70	
44	Canada	3.70	48.74	0.69	
45	TFYR of Macedonia	3.68	48.71	0.68	
46	Brazil	3.60	48.53	0.68	
47	Portugal	3.58	48.49	0.67	
48	Bulgaria	3.56	48.45	0.66	
49	Azerbaijan	3.56	48.45	0.65	●
50	Armenia	3.55	48.42	0.65	
51	Russian Federation	3.37	48.04	0.64	
52	Austria	3.33	47.96	0.63	
53	Spain	3.31	47.91	0.63	
54	Sudan	3.27	47.84	0.62	●
55	Thailand	3.27	47.83	0.61	
56	Serbia	3.24	47.77	0.60	
57	Burkina Faso	3.23	47.75	0.60	●
58	Morocco	3.22	47.72	0.59	
59	Malawi	3.20	47.68	0.58	●
60	Australia	3.17	47.61	0.58	
61	Moldova, Rep.	3.16	47.61	0.57	
62	Zimbabwe	3.12	47.53	0.56	●
63	Belarus	3.11	47.50	0.55	
64	Mexico	3.04	47.34	0.55	
65	Bahrain	3.02	47.30	0.54	
66	Latvia	2.85	46.94	0.53	
67	Cyprus	2.77	46.78	0.53	
68	Gambia	2.76	46.77	0.52	●
69	Dominican Republic	2.64	46.50	0.51	
70	Czech Republic	2.52	46.26	0.50	
71	Guatemala	2.51	46.23	0.50	
72	United Arab Emirates (2012)	2.50	46.21	0.49	
73	Iceland	2.37	45.93	0.48	
74	Tunisia	2.32	45.84	0.47	
75	South Africa	2.32	45.82	0.47	
76	Slovakia	2.24	45.67	0.46	
77	Mauritius	2.17	45.50	0.45	
78	Ukraine	2.13	45.42	0.45	
79	Indonesia	2.12	45.41	0.44	
80	Cabo Verde	2.05	45.27	0.43	
81	Egypt	2.04	45.24	0.42	
82	Ethiopia	2.03	45.22	0.42	
83	Oman	2.02	45.19	0.41	
84	Lesotho	1.98	45.11	0.40	
85	Senegal	1.97	45.09	0.40	
86	Romania	1.97	45.08	0.39	
87	Cameroon	1.95	45.05	0.38	
88	Togo	1.94	45.03	0.37	
89	United Kingdom	1.92	44.98	0.37	○
90	Uzbekistan	1.90	44.93	0.36	
91	Bosnia and Herzegovina	1.81	44.74	0.35	
92	Swaziland	1.77	44.66	0.35	
93	Argentina	1.68	44.47	0.34	
94	Venezuela, Bolivarian Rep.	1.61	44.32	0.33	
95	Turkey	1.57	44.24	0.32	
96	Kuwait (2012)	1.57	44.24	0.32	
97	Lithuania	1.55	44.20	0.31	○
98	India	1.50	44.10	0.30	
99	Rwanda	1.49	44.07	0.29	
100	Philippines	1.42	43.92	0.29	
101	United States of America	1.40	43.89	0.28	○
102	Sri Lanka	1.36	43.81	0.27	
103	Botswana	1.27	43.62	0.27	
104	Tajikistan	1.27	43.60	0.26	
105	Saudi Arabia	1.25	43.56	0.25	○
106	Côte d'Ivoire	1.20	43.46	0.24	
107	Kenya	1.17	43.39	0.24	
108	Bangladesh	1.16	43.37	0.23	
109	Paraguay	1.16	43.37	0.22	
110	Bhutan	1.12	43.29	0.22	
111	Greece	1.11	43.28	0.21	○
112	Nigeria	1.07	43.20	0.20	
113	Croatia	1.02	43.09	0.19	○
114	Korea, Rep.	0.94	42.91	0.19	○
115	Germany	0.90	42.82	0.18	○
116	Iran, Islamic Rep.	0.83	42.67	0.17	
117	El Salvador	0.81	42.64	0.17	
118	Algeria	0.80	42.63	0.16	
119	Ecuador	0.78	42.58	0.15	
120	Italy	0.63	42.27	0.14	○
121	Pakistan	0.55	42.09	0.14	
122	New Zealand	0.49	41.97	0.13	○
123	Denmark	0.48	41.95	0.12	○
124	Guinea	0.40	41.77	0.12	
125	Nepal	0.38	41.73	0.11	
126	Burundi	0.25	41.46	0.10	
127	France	0.24	41.43	0.09	○
128	Japan	0.08	41.09	0.09	○
129	Yemen	−0.37	40.14	0.08	
130	Qatar	−0.42	40.05	0.07	○
131	Norway	−0.49	39.90	0.06	○
132	Hungary	−0.56	39.74	0.06	○
133	Belgium	−0.64	39.57	0.05	○
134	Poland	−0.89	39.06	0.04	○
135	Slovenia	−0.89	39.04	0.04	○
136	Sweden	−0.92	38.99	0.03	○
137	Switzerland	−1.26	38.27	0.02	○
138	Finland	−2.06	36.57	0.01	○
139	Angola	−3.52	33.49	0.01	○
140	Malta	−19.38	0.00	0.00	○
n/a	Myanmar	n/a	n/a	n/a	

SOURCE: International Monetary Fund (with World Bank and OECD GDP estimates), extracted from World Bank *World Development Indicators* database

NOTE: ● indicates a strength; ○ a weakness

6.1.1 National office patent applications

Number of patent applications filed by residents at the national patent office (per billion PPP$ GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	China	43.59	100.00	0.96	●
1	Germany	13.12	100.00	0.96	●
1	Japan	58.00	100.00	0.96	●
1	Korea, Rep.	94.27	100.00	0.96	●
1	United States of America	17.17	100.00	0.96	●
6	New Zealand	10.64	81.10	0.95	●
7	Belarus	8.93	68.01	0.95	●
8	Iran, Islamic Rep.	8.85	67.43	0.94	●
9	Russian Federation	8.24	62.74	0.93	●
10	Slovenia (2011)	7.97	60.72	0.92	●
11	Finland	7.32	55.71	0.91	
12	Ukraine	7.28	55.44	0.90	●
13	United Kingdom	6.11	46.51	0.89	
14	Kyrgyzstan	6.09	46.34	0.88	●
15	France	5.80	44.09	0.87	
16	Austria	5.57	42.33	0.86	
17	Denmark	5.51	41.88	0.86	
18	Armenia	5.40	41.09	0.85	●
19	Sweden	5.39	41.00	0.84	
20	Mongolia (2010)	5.37	40.83	0.83	
21	Latvia	4.85	36.87	0.82	
22	Israel	4.66	35.45	0.81	
23	Poland	4.65	35.36	0.80	
24	Kazakhstan	4.61	35.06	0.79	●
25	Moldova, Rep.	4.01	30.49	0.78	
26	Italy	3.94	29.96	0.77	
27	Georgia	3.54	26.87	0.77	
28	Switzerland	3.34	25.32	0.76	
29	Norway	3.31	25.10	0.75	
30	Czech Republic	3.24	24.56	0.74	
31	Turkey	3.04	23.05	0.73	
32	Canada	2.99	22.63	0.72	
33	Netherlands	2.97	22.49	0.71	
34	Australia	2.91	22.07	0.70	
35	Hungary	2.74	20.76	0.69	
36	Romania	2.64	19.99	0.68	
37	Singapore	2.64	19.97	0.68	
38	Croatia	2.63	19.89	0.67	
39	Montenegro	2.52	19.09	0.66	
40	Greece	2.51	19.01	0.65	
41	Rwanda (2012)	2.45	18.54	0.64	
42	Iceland	2.40	18.14	0.63	
43	Portugal	2.36	17.88	0.62	
44	Luxembourg	2.29	17.36	0.61	
45	Bulgaria	2.26	17.11	0.60	
46	Serbia	2.10	15.85	0.59	
47	Spain	1.99	15.01	0.59	
48	Uzbekistan	1.91	14.42	0.58	●
49	Malaysia	1.73	13.03	0.57	
50	Sri Lanka	1.64	12.39	0.56	
51	Thailand	1.63	12.28	0.55	
52	TFYR of Macedonia	1.60	12.06	0.54	
53	India	1.57	11.84	0.53	
54	Ireland	1.56	11.76	0.52	○
55	Brazil	1.54	11.62	0.51	
56	Lithuania	1.53	11.55	0.50	
57	Belgium	1.52	11.46	0.50	
58	Morocco	1.31	9.82	0.49	
59	Slovakia	1.25	9.40	0.48	
60	Kenya	1.02	7.66	0.47	
61	Azerbaijan	0.98	7.35	0.46	
62	Malta	0.97	7.22	0.45	
63	Tunisia	0.94	6.98	0.44	
64	South Africa	0.93	6.96	0.43	
65	Viet Nam	0.93	6.96	0.42	
66	Jamaica	0.93	6.94	0.41	
67	Chile	0.86	6.39	0.41	
68	Estonia	0.73	5.38	0.40	○
69	Egypt	0.70	5.21	0.39	
70	Argentina	0.69	5.12	0.38	
71	Barbados	0.67	4.96	0.37	
72	Hong Kong (China)	0.59	4.34	0.36	○
73	Mexico	0.59	4.31	0.35	
74	Bhutan	0.55	4.06	0.34	
75	Jordan	0.46	3.35	0.33	
76	Côte d'Ivoire (2012)	0.44	3.19	0.32	
77	Yemen	0.42	3.04	0.32	●
78	Colombia	0.42	3.01	0.31	
79	Paraguay (2010)	0.41	2.93	0.30	
80	Swaziland (2012)	0.37	2.69	0.29	
81	Uruguay (2012)	0.35	2.50	0.28	
82	Philippines	0.34	2.45	0.27	
83	Saudi Arabia	0.32	2.29	0.26	○
84	Costa Rica	0.31	2.21	0.25	○
85	Nepal	0.29	2.04	0.24	
86	Indonesia	0.26	1.85	0.23	
87	Botswana	0.25	1.76	0.23	
88	Algeria	0.23	1.56	0.22	
89	Peru	0.20	1.39	0.21	
90	Bosnia and Herzegovina	0.19	1.27	0.20	
91	Pakistan	0.18	1.21	0.19	
92	Honduras	0.16	1.06	0.18	
93	Uganda	0.14	0.89	0.17	
94	Zambia (2012)	0.13	0.85	0.16	
95	Panama	0.13	0.80	0.15	
96	Madagascar	0.12	0.78	0.14	
97	Bangladesh	0.12	0.76	0.14	
98	Nicaragua	0.11	0.66	0.13	
99	Albania (2011)	0.10	0.63	0.12	
100	Tajikistan	0.10	0.57	0.11	
101	Burkina Faso (2010)	0.09	0.54	0.10	
102	Mauritius	0.09	0.52	0.09	○
103	Dominican Republic	0.09	0.50	0.08	○
104	Cyprus	0.07	0.39	0.07	○
105	Venezuela, Bolivarian Rep. (2011)	0.07	0.34	0.06	
106	Bahrain	0.05	0.23	0.05	○
107	Nigeria	0.05	0.23	0.05	
108	Guatemala	0.04	0.10	0.04	○
109	United Arab Emirates	0.03	0.08	0.03	○
110	Qatar	0.03	0.07	0.02	○
111	Ecuador (2010)	0.03	0.06	0.01	○
112	Cambodia	0.02	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: World Intellectual Property Organization, *WIPO Statistics Database*; International Monetary Fund *World Economic Outlook Database*, 2015 (PPP$ GDP)

NOTE: ● indicates a strength; ○ a weakness

6.1.2 Patent Cooperation Treaty resident applications

Number of international patent applications filed by residents at the Patent Cooperation Treaty (per billion PPP$ GDP) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Barbados	38.75	100.00	0.96	●
1	Finland	8.21	100.00	0.96	●
1	Japan	8.94	100.00	0.96	●
1	Sweden	8.76	100.00	0.96	●
1	Switzerland	8.70	100.00	0.96	●
6	Luxembourg	7.62	92.85	0.95	
7	Korea, Rep.	7.39	90.03	0.94	
8	Israel	5.95	72.39	0.93	
9	Netherlands	5.28	64.31	0.92	
10	Denmark	5.21	63.48	0.91	
11	Germany	4.84	58.91	0.90	
12	Malta	4.11	49.97	0.89	
13	United States of America	3.53	42.97	0.88	
14	Austria	3.51	42.68	0.87	
15	France	3.22	39.23	0.86	
16	Iceland	3.03	36.82	0.85	
17	Slovenia	2.55	31.05	0.84	
18	Belgium	2.49	30.24	0.83	
19	New Zealand	2.18	26.49	0.82	
20	Singapore	2.09	25.36	0.81	
21	Seychelles	2.08	25.27	0.80	●
22	United Kingdom	2.07	25.20	0.79	
23	Norway	2.00	24.31	0.78	
24	Canada	1.94	23.60	0.77	
25	Ireland	1.94	23.59	0.76	
26	Australia	1.58	19.15	0.75	
27	China	1.45	17.62	0.74	
28	Italy	1.44	17.48	0.73	
29	Cyprus	1.39	16.84	0.72	
30	Spain	1.09	13.22	0.71	
31	Estonia	0.81	9.87	0.70	
32	Hungary	0.65	7.82	0.69	
33	Lithuania	0.62	7.45	0.68	
34	Croatia	0.61	7.39	0.67	
35	Latvia	0.60	7.29	0.66	
36	Czech Republic	0.60	7.27	0.65	
37	Portugal	0.56	6.82	0.64	
38	Turkey	0.53	6.43	0.63	
39	Greece	0.47	5.65	0.62	
40	Slovakia	0.43	5.14	0.61	
41	South Africa	0.42	5.09	0.60	
42	Malaysia	0.42	5.08	0.59	
43	Bulgaria	0.40	4.78	0.58	
44	Ukraine	0.37	4.42	0.57	
45	Poland	0.37	4.41	0.56	
46	Chile	0.35	4.24	0.55	
47	Russian Federation	0.25	3.00	0.54	
48	Panama	0.21	2.50	0.53	
49	India	0.19	2.26	0.52	
50	Morocco	0.18	2.13	0.51	
51	Brazil	0.18	2.12	0.49	
52	Moldova, Rep.	0.17	2.02	0.48	
53	Armenia	0.16	1.96	0.47	
54	United Arab Emirates	0.16	1.94	0.46	
55	Colombia	0.16	1.90	0.45	
56	Serbia	0.15	1.74	0.44	
57	TFYR of Macedonia	0.14	1.72	0.43	
58	Mexico	0.13	1.57	0.42	
59	Bosnia and Herzegovina	0.13	1.55	0.41	
60	Namibia	0.13	1.50	0.40	
61	Costa Rica	0.13	1.50	0.39	
62	Zimbabwe (2013)	0.12	1.36	0.38	
63	Montenegro	0.11	1.26	0.37	
64	Sri Lanka	0.10	1.13	0.36	
65	Senegal	0.09	1.04	0.35	
66	Belarus	0.08	0.87	0.34	
67	Thailand	0.07	0.79	0.33	
68	Kenya	0.07	0.78	0.32	
69	Romania	0.07	0.76	0.31	
70	Tunisia	0.06	0.74	0.30	
71	Niger (2012)	0.06	0.74	0.29	
72	Madagascar	0.06	0.67	0.28	
73	El Salvador	0.06	0.67	0.27	
74	Rwanda (2013)	0.06	0.66	0.26	
75	Qatar	0.06	0.64	0.25	
76	Kyrgyzstan	0.05	0.59	0.24	
77	Uganda	0.05	0.59	0.23	
78	Egypt	0.05	0.57	0.22	
79	Philippines	0.05	0.57	0.21	
80	Kazakhstan	0.05	0.51	0.20	
81	Côte d'Ivoire	0.04	0.47	0.19	
82	Ecuador	0.04	0.43	0.18	
83	Uzbekistan	0.03	0.38	0.17	
84	Peru	0.03	0.35	0.16	○
85	Bahrain	0.03	0.35	0.15	
86	Albania	0.03	0.34	0.14	
87	Georgia	0.03	0.31	0.13	○
88	Sudan	0.03	0.26	0.12	
89	Trinidad and Tobago	0.02	0.23	0.11	○
90	Dominican Republic	0.02	0.22	0.10	○
91	Ghana (2013)	0.02	0.19	0.09	○
92	Oman (2013)	0.02	0.19	0.08	○
93	Cameroon (2013)	0.02	0.15	0.07	○
94	Viet Nam	0.01	0.12	0.06	○
95	Algeria	0.01	0.11	0.05	
96	Angola	0.01	0.09	0.04	
97	Guatemala	0.01	0.06	0.03	○
98	Indonesia	0.01	0.03	0.02	○
99	Azerbaijan	0.01	0.03	0.01	○
100	Nigeria	0.00	0.00	0.00	○
n/a	Argentina	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Hong Kong (China)	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Mauritius	n/a	n/a	n/a	
n/a	Mongolia	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Pakistan	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Uruguay	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	

SOURCE: World Intellectual Property Organization, *WIPO Statistics Database*; International Monetary Fund *World Economic Outlook Database*, 2015 (PPP$ GDP)

NOTE: ● indicates a strength; ○ a weakness

6.1.3 National office resident utility model applications

Number of utility model applications filed by residents at the national patent office (per billion PPP$ GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Belarus	6.25	100.00	0.95	●
1	China	54.73	100.00	0.95	●
1	Moldova, Rep.	12.64	100.00	0.95	●
1	Ukraine	25.44	100.00	0.95	●
5	Mongolia (2010)	6.20	99.12	0.93	●
6	Korea, Rep.	6.17	98.59	0.92	
7	Czech Republic	5.47	87.37	0.90	
8	Russian Federation	3.89	62.15	0.88	●
9	Germany	3.23	51.47	0.86	
10	Tajikistan	3.20	51.08	0.85	●
11	Bulgaria	2.90	46.19	0.83	●
12	Estonia	2.76	44.04	0.81	
13	Turkey	2.40	38.22	0.80	●
14	Slovakia	2.31	36.76	0.78	
15	Finland	2.04	32.40	0.76	
16	Georgia	1.93	30.64	0.75	
17	Armenia	1.73	27.48	0.73	
18	Spain	1.66	26.37	0.71	
19	Thailand	1.62	25.71	0.69	
20	Austria	1.46	23.25	0.68	
21	Japan	1.27	20.18	0.66	
22	Italy	1.18	18.65	0.64	
23	Philippines	1.16	18.29	0.63	
24	Uzbekistan	1.09	17.28	0.61	●
25	Poland	1.08	17.13	0.59	
26	Australia	1.08	17.02	0.58	
27	Hungary	0.99	15.71	0.56	
28	Gambia	0.99	15.57	0.54	●
29	Brazil	0.90	14.20	0.53	
30	Croatia	0.89	14.05	0.51	
31	Hong Kong (China)	0.81	12.83	0.49	
32	Serbia	0.74	11.65	0.47	
33	Rwanda (2012)	0.73	11.55	0.46	
34	Denmark	0.64	10.11	0.44	○
35	Kenya	0.63	9.86	0.42	
36	Uruguay (2012)	0.60	9.44	0.41	
37	Viet Nam	0.48	7.40	0.39	
38	Kyrgyzstan	0.44	6.81	0.37	
39	Colombia	0.37	5.72	0.36	
40	Portugal	0.35	5.33	0.34	○
41	Peru	0.35	5.33	0.32	
42	Kazakhstan	0.32	4.96	0.31	
43	Mexico	0.31	4.78	0.29	
44	Chile	0.22	3.33	0.27	○
45	Honduras	0.19	2.78	0.25	
46	Guatemala	0.18	2.61	0.24	
47	Argentina	0.17	2.55	0.22	
48	Slovenia (2010)	0.16	2.29	0.20	○
49	Romania	0.14	2.07	0.19	○
50	Burkina Faso (2010)	0.14	1.98	0.17	
51	Ecuador (2010)	0.13	1.88	0.15	
52	Botswana (2012)	0.10	1.40	0.14	○
53	Malaysia	0.10	1.39	0.12	○
54	Indonesia	0.09	1.26	0.10	
55	Greece	0.09	1.22	0.08	○
56	France	0.08	1.04	0.07	○
57	Azerbaijan	0.07	0.89	0.05	○
58	Costa Rica	0.04	0.49	0.03	○
59	Dominican Republic	0.04	0.41	0.02	○
60	Panama	0.01	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Algeria	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Belgium	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Canada	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Cyprus	n/a	n/a	n/a	
n/a	Egypt	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Iceland	n/a	n/a	n/a	
n/a	India	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Ireland	n/a	n/a	n/a	
n/a	Israel	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Latvia	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Lithuania	n/a	n/a	n/a	
n/a	Luxembourg	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Malta	n/a	n/a	n/a	
n/a	Mauritius	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Morocco	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Netherlands	n/a	n/a	n/a	
n/a	New Zealand	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Norway	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Pakistan	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Qatar	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Singapore	n/a	n/a	n/a	
n/a	South Africa	n/a	n/a	n/a	
n/a	Sri Lanka	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Sweden	n/a	n/a	n/a	
n/a	Switzerland	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	TFYR of Macedonia	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Tunisia	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	United Kingdom	n/a	n/a	n/a	
n/a	United States of America	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: World Intellectual Property Organization, *WIPO Statistics Database*; International Monetary Fund *World Economic Outlook Database*, 2015 (PPP$ GDP)

NOTE: ● indicates a strength; ○ a weakness

6.1.4 Scientific and technical publications

Number of scientific and technical journal articles (per billion PPP$ GDP) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Iceland	65.94	100.00	1.00	●
2	Denmark	63.36	96.08	0.99	●
3	Slovenia	59.35	89.96	0.99	●
4	Switzerland	55.74	84.47	0.98	
5	Finland	54.05	81.89	0.97	
6	Sweden	53.73	81.40	0.96	●
7	New Zealand	51.89	78.59	0.96	●
8	Serbia	51.56	78.10	0.95	●
9	Estonia	48.54	73.49	0.94	●
10	Australia	47.67	72.17	0.94	
11	Israel	46.40	70.24	0.93	
12	Portugal	45.00	68.10	0.92	●
13	Netherlands	43.83	66.32	0.91	
14	United Kingdom	41.46	62.70	0.91	
15	Belgium	40.50	61.25	0.90	
16	Gambia	39.58	59.85	0.89	●
17	Canada	37.40	56.52	0.88	
18	Czech Republic	35.44	53.54	0.88	
19	Cyprus	35.16	53.12	0.87	
20	Croatia	34.96	52.80	0.86	●
21	Austria	34.58	52.23	0.86	
22	Greece	33.98	51.32	0.85	●
23	Spain	33.65	50.81	0.84	
24	Norway	33.62	50.77	0.83	
25	Ireland	31.41	47.40	0.83	
26	Korea, Rep.	29.83	45.00	0.82	
27	Armenia	28.54	43.03	0.81	●
28	Italy	27.26	41.09	0.81	
29	Hungary	26.36	39.71	0.80	
30	Malawi	26.23	39.51	0.79	●
31	Germany	25.98	39.13	0.78	
32	France	25.73	38.75	0.78	
33	Singapore	25.70	38.71	0.77	
34	Lithuania	25.46	38.33	0.76	
35	Tunisia	25.44	38.30	0.76	●
36	Poland	24.74	37.24	0.75	
37	Montenegro	21.58	32.43	0.74	
38	Slovakia	21.50	32.30	0.73	
39	United States of America	20.58	30.90	0.73	
40	Iran, Islamic Rep.	19.99	30.00	0.72	●
41	Luxembourg	19.33	29.01	0.71	
42	Romania	17.92	26.85	0.71	
43	Fiji	17.28	25.87	0.70	●
44	Turkey	17.18	25.72	0.69	
45	Malta	17.13	25.64	0.68	
46	Chile	16.57	24.80	0.68	
47	Georgia	16.34	24.45	0.67	
48	Bulgaria	16.07	24.03	0.66	
49	Japan	15.65	23.39	0.65	
50	South Africa	15.45	23.08	0.65	
51	Jordan	14.92	22.28	0.64	
52	Barbados	14.17	21.14	0.63	
53	China	13.98	20.85	0.63	
54	Malaysia	13.91	20.74	0.62	
55	Moldova, Rep.	13.77	20.53	0.61	
56	Seychelles	13.72	20.45	0.60	
57	Zimbabwe	13.34	19.88	0.60	●
58	Ukraine	13.24	19.72	0.59	
59	Lebanon	13.13	19.55	0.58	
60	Latvia	12.83	19.09	0.58	
61	Uruguay	12.65	18.82	0.57	
62	TFYR of Macedonia	12.60	18.74	0.56	
63	Brazil	11.82	17.55	0.55	
64	Kenya	11.49	17.06	0.55	
65	Uganda	11.46	17.02	0.54	
66	Cameroon	11.28	16.74	0.53	●
67	Senegal	10.65	15.78	0.53	
68	Burkina Faso	9.96	14.73	0.52	●
69	Egypt	9.16	13.50	0.51	
70	Bosnia and Herzegovina	9.09	13.40	0.50	
71	Argentina	8.55	12.58	0.50	
72	Rwanda	8.38	12.33	0.49	
73	Cabo Verde	8.23	12.10	0.48	
74	Russian Federation	8.21	12.05	0.47	
75	Pakistan	7.78	11.40	0.47	
76	Botswana	7.74	11.34	0.46	
77	India	7.46	10.92	0.45	
78	Nepal	7.35	10.75	0.45	●
79	Bhutan	7.34	10.74	0.44	
80	Costa Rica	7.24	10.59	0.43	
81	Ethiopia	6.93	10.11	0.42	
82	Saudi Arabia	6.92	10.09	0.42	
83	Tanzania, United Rep.	6.80	9.91	0.41	
84	Togo	6.70	9.76	0.40	●
85	Thailand	6.67	9.71	0.40	
86	Namibia	6.66	9.70	0.39	
87	Niger	6.58	9.57	0.38	
88	Ghana	6.54	9.52	0.37	
89	Morocco	6.35	9.23	0.37	
90	Belarus	6.34	9.22	0.36	
91	Mongolia	6.10	8.84	0.35	
92	Madagascar	5.70	8.23	0.35	
93	Jamaica	5.64	8.15	0.34	
94	Mozambique	5.53	7.98	0.33	
95	Mexico	5.52	7.96	0.32	
96	Albania	5.26	7.57	0.32	
97	Colombia	5.09	7.30	0.31	
98	Mali	4.87	6.97	0.30	
99	Viet Nam	4.74	6.78	0.29	
100	Guyana	4.72	6.74	0.29	
101	Panama	4.62	6.59	0.28	
102	Zambia	4.57	6.52	0.27	
103	Mauritius	4.54	6.47	0.27	
104	Kyrgyzstan	4.44	6.31	0.26	
105	Lesotho	4.35	6.19	0.25	
106	Cambodia	4.32	6.14	0.24	
107	Algeria	4.22	5.98	0.24	
108	Qatar	3.94	5.56	0.23	
109	Swaziland	3.83	5.38	0.22	
110	Oman	3.82	5.38	0.22	
111	Trinidad and Tobago	3.71	5.20	0.21	
112	Guinea	3.47	4.84	0.20	●
113	Bolivia, Plurinational St.	3.22	4.45	0.19	
114	Côte d'Ivoire	3.21	4.44	0.19	
115	Ecuador	3.01	4.14	0.18	
116	Sri Lanka	2.90	3.97	0.17	○
117	Bangladesh	2.83	3.87	0.17	
118	Burundi	2.75	3.73	0.16	
119	United Arab Emirates	2.70	3.67	0.15	○
120	Azerbaijan	2.66	3.61	0.14	
121	Bahrain	2.65	3.59	0.14	○
122	Peru	2.40	3.22	0.13	○
123	Kuwait	2.36	3.14	0.12	
124	Nigeria	2.08	2.72	0.12	
125	Nicaragua	2.07	2.71	0.11	
126	Tajikistan	2.06	2.69	0.10	
127	Sudan	2.05	2.67	0.09	
128	Yemen	2.04	2.65	0.09	
129	Uzbekistan	1.89	2.43	0.08	
130	Kazakhstan	1.57	1.94	0.07	○
131	Philippines	1.56	1.94	0.06	○
132	Venezuela, Bolivarian Rep.	1.50	1.84	0.06	
133	Paraguay	1.03	1.12	0.05	○
134	Guatemala	1.02	1.11	0.04	○
135	Honduras	0.92	0.96	0.04	○
136	El Salvador	0.88	0.90	0.03	○
137	Indonesia	0.61	0.48	0.02	○
138	Dominican Republic	0.44	0.23	0.01	○
139	Angola	0.31	0.02	0.01	○
140	Myanmar	0.29	0.00	0.00	○
n/a	Hong Kong (China)	n/a	n/a	n/a	

SOURCE: Thomson Reuters, Web of Science, SCI and SSCI; International Monetary Fund *World Economic Outlook Database,* 2015 (PPP$ GDP)

NOTE: ● indicates a strength; ○ a weakness

6.1.5 Citable documents H index

The H index is the economy's number of published articles (H) that have received at least H citations in the period 1996–2013 | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	United Kingdom	934.00	100.00	0.99	●
1	United States of America	1,518.00	100.00	0.99	●
3	Germany	815.00	87.08	0.99	●
4	France	742.00	79.15	0.98	●
5	Canada	725.00	77.31	0.97	●
6	Japan	694.00	73.94	0.96	●
7	Italy	654.00	69.60	0.96	●
8	Netherlands	636.00	67.64	0.95	
9	Switzerland	629.00	66.88	0.94	
10	Australia	583.00	61.89	0.94	
11	Sweden	567.00	60.15	0.93	
12	Spain	531.00	56.24	0.92	●
13	Belgium	502.00	53.09	0.91	●
14	Denmark	476.00	50.27	0.91	
15	Israel	456.00	48.10	0.90	
16	China	436.00	45.93	0.89	
17	Austria	416.00	43.76	0.89	
18	Finland	407.00	42.78	0.88	
19	Korea, Rep.	375.00	39.31	0.87	
20	Norway	362.00	37.89	0.86	
21	Russian Federation	355.00	37.13	0.86	●
22	Brazil	342.00	35.72	0.85	●
23	India	341.00	35.61	0.84	●
24	Poland	336.00	35.07	0.84	●
25	Hong Kong (China)	325.00	33.88	0.83	
26	New Zealand	318.00	33.12	0.82	
27	Singapore	308.00	32.03	0.81	
28	Ireland	299.00	31.05	0.81	
29	Greece	295.00	30.62	0.80	
30	Hungary	277.00	28.66	0.79	
31	Portugal	269.00	27.80	0.79	
32	Czech Republic	268.00	27.69	0.78	
33	Mexico	261.00	26.93	0.77	●
34	South Africa	260.00	26.82	0.76	
35	Argentina	249.00	25.62	0.76	●
36	Turkey	237.00	24.32	0.75	
37	Chile	214.00	21.82	0.74	
38	Thailand	190.00	19.22	0.74	
39	Iceland	181.00	18.24	0.73	
40	Slovenia	172.00	17.26	0.72	
41	Slovakia	165.00	16.50	0.71	
42	Croatia	161.00	16.07	0.71	
43	Ukraine	159.00	15.85	0.70	
44	Iran, Islamic Rep.	158.00	15.74	0.69	●
45	Bulgaria	154.00	15.31	0.69	
46	Romania	153.00	15.20	0.68	
47	Colombia	151.00	14.98	0.67	
48	Kenya	149.00	14.77	0.66	
49	Egypt	148.00	14.66	0.65	●
49	Estonia	148.00	14.66	0.65	
51	Malaysia	145.00	14.33	0.64	
52	Saudi Arabia	144.00	14.22	0.64	
53	Venezuela, Bolivarian Rep.	141.00	13.90	0.63	●
54	Philippines	131.00	12.81	0.62	
55	Pakistan	130.00	12.70	0.61	●
56	Indonesia	126.00	12.27	0.60	
56	Peru	126.00	12.27	0.60	
58	Lithuania	122.00	11.83	0.59	
58	Viet Nam	122.00	11.83	0.59	
60	Panama	119.00	11.51	0.58	
61	Armenia	116.00	11.18	0.57	
62	Costa Rica	115.00	11.07	0.56	
63	Belarus	114.00	10.97	0.55	
63	Uruguay	114.00	10.97	0.55	
65	Bangladesh	112.00	10.75	0.54	●
66	Uganda	111.00	10.64	0.54	
67	Lebanon	109.00	10.42	0.52	
67	Morocco	109.00	10.42	0.52	
69	Nigeria	103.00	9.77	0.51	●
70	Tanzania, United Rep.	102.00	9.66	0.51	●
71	Cyprus	100.00	9.45	0.49	
71	United Arab Emirates	100.00	9.45	0.49	
73	Tunisia	97.00	9.12	0.49	
74	Sri Lanka	96.00	9.01	0.48	
75	Latvia	94.00	8.79	0.47	
76	Ecuador	92.00	8.58	0.44	
76	Jordan	92.00	8.58	0.44	
76	Kuwait	92.00	8.58	0.44	
76	Luxembourg	92.00	8.58	0.44	
80	Georgia	90.00	8.36	0.44	
81	Algeria	89.00	8.25	0.42	●
81	Malawi	89.00	8.25	0.42	
83	Serbia	86.00	7.93	0.41	
84	Gambia	85.00	7.82	0.41	
85	Senegal	83.00	7.60	0.40	
86	Ethiopia	82.00	7.49	0.39	
86	Ghana	82.00	7.49	0.39	
88	Zimbabwe	81.00	7.38	0.38	
89	Nepal	80.00	7.27	0.37	
90	Cameroon	78.00	7.06	0.36	
91	Côte d'Ivoire	76.00	6.84	0.36	
92	Zambia	75.00	6.73	0.35	
93	Oman	74.00	6.62	0.34	
94	Bolivia, Plurinational St.	71.00	6.30	0.33	
94	Burkina Faso	71.00	6.30	0.33	
96	Malta	70.00	6.19	0.32	○
97	Moldova, Rep.	68.00	5.97	0.31	
98	TFYR of Macedonia	67.00	5.86	0.30	○
98	Trinidad and Tobago	67.00	5.86	0.30	
100	Jamaica	64.00	5.54	0.29	
101	Botswana	63.00	5.43	0.29	
102	Madagascar	62.00	5.32	0.27	
102	Namibia	62.00	5.32	0.27	
104	Mongolia	61.00	5.21	0.26	
105	Mozambique	60.00	5.10	0.25	
105	Qatar	60.00	5.10	0.25	
107	Kazakhstan	59.00	4.99	0.24	
107	Mali	59.00	4.99	0.24	
109	Guatemala	58.00	4.89	0.21	
109	Sudan	58.00	4.89	0.21	
109	Uzbekistan	58.00	4.89	0.21	
112	Cambodia	57.00	4.78	0.21	
113	Barbados	55.00	4.56	0.20	○
114	Nicaragua	51.00	4.13	0.19	
114	Niger	51.00	4.13	0.19	
116	Azerbaijan	50.00	4.02	0.18	
117	Bosnia and Herzegovina	49.00	3.91	0.17	○
118	Paraguay	48.00	3.80	0.16	
119	Fiji	46.00	3.58	0.16	○
120	Honduras	45.00	3.47	0.14	○
120	Mauritius	45.00	3.47	0.14	○
122	Bahrain	43.00	3.26	0.12	○
122	Dominican Republic	43.00	3.26	0.12	○
122	Rwanda	43.00	3.26	0.12	
125	Yemen	42.00	3.15	0.11	
126	Myanmar	41.00	3.04	0.11	
127	Albania	40.00	2.93	0.10	○
128	Seychelles	38.00	2.71	0.09	○
129	Guinea	37.00	2.61	0.09	
130	El Salvador	36.00	2.50	0.08	○
131	Kyrgyzstan	35.00	2.39	0.06	○
131	Swaziland	35.00	2.39	0.06	○
133	Togo	33.00	2.17	0.06	
134	Angola	28.00	1.63	0.04	
134	Guyana	28.00	1.63	0.04	○
136	Burundi	26.00	1.41	0.04	
137	Tajikistan	24.00	1.19	0.03	○
138	Lesotho	23.00	1.09	0.01	○
138	Montenegro	23.00	1.09	0.01	○
140	Bhutan	20.00	0.76	0.01	○
141	Cabo Verde	13.00	0.00	0.00	○

SOURCE: SCImago. (2007). SJR — SCImago Journal & Country Rank. Retrieved February, 2015.

NOTE: ● indicates a strength; ○ a weakness

6.2.1 Growth rate of GDP per person engaged

Growth rate of GDP per person engaged (constant 1990 PPP$) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	China	7.13	100.00	1.00	●
2	Kyrgyzstan	6.55	96.01	0.99	●
3	Sri Lanka	6.21	93.67	0.98	●
4	Moldova, Rep.	5.35	87.75	0.97	●
5	Ghana	5.31	87.48	0.97	●
6	Uzbekistan	5.31	87.48	0.96	●
7	Myanmar	5.24	87.06	0.95	●
8	Côte d'Ivoire	5.17	86.58	0.94	●
9	Cambodia	5.05	85.70	0.93	●
10	Philippines	4.61	82.71	0.92	●
11	Armenia	4.58	82.49	0.91	●
12	Tajikistan	4.45	81.61	0.90	●
13	Kazakhstan	4.15	79.57	0.90	●
14	Mozambique	3.97	78.34	0.89	●
15	Peru	3.93	78.01	0.88	●
16	Chile	3.85	77.46	0.87	●
17	Viet Nam	3.80	77.15	0.86	●
18	Tanzania, United Rep.	3.66	76.22	0.85	●
19	Morocco	3.61	75.83	0.84	●
20	Ethiopia	3.60	75.78	0.83	●
21	Indonesia	3.60	75.77	0.83	●
22	Nigeria	3.48	74.95	0.82	●
23	South Africa	3.47	74.85	0.81	●
24	Bangladesh	3.43	74.62	0.80	●
25	Jordan	3.40	74.40	0.79	●
26	Hong Kong (China)	3.34	73.98	0.78	
27	Kenya	3.14	72.63	0.77	●
28	Bolivia, Plurinational St.	3.11	72.41	0.77	●
29	Malaysia	2.96	71.39	0.76	
30	Burkina Faso	2.91	71.04	0.75	●
31	Azerbaijan	2.87	70.78	0.74	●
32	Zambia	2.86	70.69	0.73	●
33	Georgia	2.83	70.52	0.72	
34	Uruguay	2.76	70.04	0.71	
35	Belarus	2.76	69.98	0.70	
36	Oman	2.62	69.08	0.70	
37	Thailand	2.50	68.20	0.69	
38	India	2.42	67.69	0.68	
39	Niger	2.38	67.39	0.67	●
40	Trinidad and Tobago	2.20	66.15	0.66	●
41	Colombia	2.16	65.89	0.65	
42	Tunisia	2.13	65.69	0.64	
43	Angola	2.05	65.14	0.63	●
44	Latvia	2.03	65.00	0.63	
45	Yemen	2.03	64.98	0.62	●
46	Lithuania	1.99	64.74	0.61	
47	Costa Rica	1.98	64.66	0.60	
48	Ecuador	1.94	64.41	0.59	●
49	Mali	1.84	63.67	0.58	●
50	Korea, Rep.	1.74	63.05	0.57	
51	Uganda	1.74	63.00	0.57	
52	Malawi	1.73	62.96	0.56	●
53	Israel	1.69	62.67	0.55	
54	Cameroon	1.67	62.56	0.54	●
55	Romania	1.67	62.52	0.53	
56	Russian Federation	1.65	62.38	0.52	
57	Algeria	1.63	62.28	0.51	●
58	Spain	1.58	61.93	0.50	○
59	Singapore	1.58	61.89	0.50	○
60	Japan	1.55	61.68	0.49	
61	Bahrain	1.48	61.26	0.48	
62	Argentina	1.43	60.90	0.47	
63	Norway	1.39	60.63	0.46	○
64	Australia	1.38	60.56	0.45	
65	Sweden	1.35	60.36	0.44	○
66	Ukraine	1.23	59.54	0.43	
67	Poland	1.22	59.42	0.43	
68	Saudi Arabia	1.21	59.39	0.42	
69	United Arab Emirates	1.19	59.23	0.41	
70	TFYR of Macedonia	1.12	58.79	0.40	
71	Estonia	0.98	57.80	0.39	○
72	Ireland	0.97	57.74	0.38	○
73	Senegal	0.95	57.60	0.37	
74	Sudan	0.94	57.51	0.37	●
75	Pakistan	0.90	57.22	0.36	
76	Denmark	0.86	56.98	0.35	○
77	Slovakia	0.85	56.92	0.34	○
78	United Kingdom	0.82	56.68	0.33	○
79	United States of America	0.81	56.61	0.32	○
80	Brazil	0.79	56.52	0.31	
81	New Zealand	0.79	56.50	0.30	○
82	Albania	0.68	55.74	0.30	
83	Bulgaria	0.65	55.56	0.29	○
84	Finland	0.56	54.91	0.28	○
85	Qatar	0.43	54.04	0.27	
86	Switzerland	0.43	54.00	0.26	○
87	Netherlands	0.40	53.85	0.25	○
88	Guatemala	0.40	53.81	0.24	
89	Portugal	0.35	53.46	0.23	○
90	Bosnia and Herzegovina	0.34	53.43	0.23	
91	Germany	0.30	53.14	0.22	○
92	Mexico	0.28	53.03	0.21	○
93	Dominican Republic	0.20	52.43	0.20	
94	Hungary	0.19	52.39	0.19	○
95	France	0.18	52.35	0.18	○
96	Croatia	0.14	52.06	0.17	○
97	Canada	0.12	51.90	0.17	○
98	Belgium	0.02	51.22	0.16	○
99	Italy	0.01	51.18	0.15	○
100	Austria	−0.02	50.97	0.14	○
101	Egypt	−0.12	50.24	0.13	
102	Luxembourg	−0.17	49.94	0.12	○
103	Iceland	−0.19	49.75	0.11	○
104	Malta	−0.28	49.14	0.10	○
105	Czech Republic	−0.37	48.56	0.10	○
106	Turkey	−0.61	46.92	0.09	○
107	Madagascar	−0.64	46.70	0.08	
108	Greece	−0.73	46.09	0.07	○
109	Venezuela, Bolivarian Rep.	−0.89	44.99	0.06	
110	Barbados	−0.99	44.30	0.05	○
111	Slovenia	−1.04	43.96	0.04	○
112	Jamaica	−1.06	43.83	0.03	○
113	Kuwait	−1.06	43.78	0.03	○
114	Iran, Islamic Rep.	−2.76	32.15	0.02	○
115	Zimbabwe	−3.39	27.81	0.01	○
116	Cyprus	−7.45	0.00	0.00	○
n/a	Bhutan	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Mauritius	n/a	n/a	n/a	
n/a	Mongolia	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Panama	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Serbia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	

SOURCE: The Conference Board Total Economy Database™ Output, Labor and Labor Productivity Country Details, 1950–2013, January 2014

NOTE: ● indicates a strength; ○ a weakness

6.2.2 New business density

New business density (new registrations per thousand population 15–64 years old) | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank		
1	Cyprus	22.51	100.00	0.97	●	
1	Hong Kong (China)	28.12	100.00	0.97	●	
1	Luxembourg	20.98	100.00	0.97	●	
1	New Zealand	15.07	100.00	0.97	●	
5	Panama	14.10	93.57	0.96	●	
6	Malta	13.61	90.31	0.95		
7	Botswana	12.30	81.59	0.94	●	
8	Australia	12.16	80.69	0.93		
9	Latvia	11.63	77.17	0.92	●	
10	United Kingdom	11.04	73.21	0.91		
11	Montenegro (2011)	10.66	70.75	0.90	●	
12	Bulgaria	9.03	59.88	0.90	●	
13	Iceland	8.17	54.18	0.89		
14	Singapore	8.04	53.37	0.88		
15	Estonia (2007)	7.92	52.52	0.87		
16	Norway	7.83	51.92	0.86		
17	Mauritius	7.40	49.06	0.85	●	
18	South Africa	6.54	43.36	0.84	●	
19	Sweden	6.41	42.51	0.83		
20	Chile	5.69	37.71	0.82		
21	Slovakia	5.11	33.88	0.81	●	
22	Georgia	4.86	32.25	0.80	●	
23	Hungary	4.75	31.53	0.79		
24	Lithuania	4.71	31.25	0.78		
25	Ireland	4.50	29.84	0.77		
26	Netherlands	4.44	29.46	0.76		
27	Slovenia	4.36	28.92	0.75		
28	Denmark	4.36	28.90	0.74		
29	Russian Federation	4.30	28.53	0.73		
30	Romania	4.12	27.34	0.72		
31	Peru	3.83	25.39	0.71		
32	Portugal (2010)	3.62	24.02	0.70		
33	TFYR of Macedonia	3.60	23.90	0.70		
34	Costa Rica	3.55	23.52	0.69		
35	Uruguay	2.98	19.77	0.68		
36	Czech Republic	2.96	19.64	0.67		
37	Israel	2.96	19.63	0.66		
38	France	2.88	19.08	0.65		
39	Croatia	2.82	18.70	0.64		
40	Spain	2.71	17.99	0.63		
41	Switzerland	2.53	16.79	0.62		○
42	Belgium	2.48	16.43	0.61		
43	Finland	2.32	15.35	0.60		
44	Malaysia	2.28	15.10	0.59		
45	Brazil	2.17	14.36	0.58		
46	Korea, Rep.	2.03	13.44	0.57		
47	Colombia	2.00	13.25	0.56		
48	Italy	1.91	12.63	0.55		
49	Oman (2009)	1.74	11.52	0.54		
50	Qatar	1.74	11.51	0.53		
51	Kazakhstan	1.71	11.35	0.52		
52	Serbia	1.68	11.10	0.51		
53	Moldova, Rep. (2009)	1.63	10.80	0.50		
54	Armenia	1.55	10.26	0.50		
55	Tunisia (2011)	1.52	10.07	0.49		
56	Lesotho	1.49	9.84	0.48	●	
57	United Arab Emirates	1.38	9.12	0.47		
58	Zambia	1.36	8.99	0.46		
59	Germany	1.29	8.53	0.45		○
60	Morocco (2009)	1.26	8.33	0.44		
61	Uganda	1.17	7.72	0.43		
62	Japan	1.15	7.62	0.42		○
63	Belarus	1.14	7.54	0.41		
64	Jamaica	1.11	7.37	0.40		
65	Rwanda	1.07	7.10	0.39		
66	Canada	1.07	7.09	0.38		○
67	Dominican Republic	1.05	6.92	0.37		
68	Jordan	0.98	6.49	0.36		
69	Kyrgyzstan	0.92	6.10	0.35		
70	Ukraine	0.92	6.10	0.34		
71	Nigeria	0.91	5.99	0.33		
72	Ghana	0.90	5.92	0.32		
73	Mexico	0.88	5.80	0.31		
74	Albania	0.88	5.79	0.30		
75	Thailand	0.86	5.66	0.30		
76	Namibia	0.85	5.65	0.29		
77	Kenya (2008)	0.84	5.57	0.28		
78	Turkey	0.79	5.20	0.27		
79	Greece (2010)	0.77	5.06	0.26		
80	Bosnia and Herzegovina	0.70	4.62	0.25		
81	Azerbaijan	0.70	4.60	0.24		
82	Nepal	0.66	4.35	0.23		
83	Uzbekistan	0.64	4.25	0.22		
84	Bolivia, Plurinational St.	0.56	3.71	0.21		
85	Algeria	0.53	3.52	0.20		
86	Poland (2009)	0.53	3.49	0.19		○
87	Guatemala	0.52	3.44	0.18		
88	Sri Lanka	0.51	3.40	0.17		○
89	Austria	0.50	3.28	0.16		○
90	El Salvador	0.48	3.18	0.15		
91	Argentina	0.47	3.07	0.14		
92	Indonesia	0.29	1.93	0.13		
93	Philippines	0.27	1.78	0.12		○
94	Senegal	0.27	1.75	0.11		
95	Tajikistan	0.26	1.68	0.10		
96	Guinea	0.23	1.48	0.10		
97	Bhutan	0.20	1.32	0.09		
98	Burkina Faso	0.15	0.96	0.08		○
99	India	0.12	0.80	0.07		○
100	Togo	0.12	0.79	0.06		
101	Bangladesh	0.09	0.59	0.05		○
102	Malawi (2009)	0.08	0.53	0.04		○
103	Madagascar	0.05	0.32	0.03		○
104	Pakistan	0.04	0.23	0.02		○
105	Ethiopia (2009)	0.03	0.18	0.01		○
106	Niger (2009)	0.00	0.00	0.00		○
n/a	Angola	n/a	n/a	n/a		
n/a	Bahrain	n/a	n/a	n/a		
n/a	Barbados	n/a	n/a	n/a		
n/a	Burundi	n/a	n/a	n/a		
n/a	Cabo Verde	n/a	n/a	n/a		
n/a	Cambodia	n/a	n/a	n/a		
n/a	Cameroon	n/a	n/a	n/a		
n/a	China	n/a	n/a	n/a		
n/a	Côte d'Ivoire	n/a	n/a	n/a		
n/a	Ecuador	n/a	n/a	n/a		
n/a	Egypt	n/a	n/a	n/a		
n/a	Fiji	n/a	n/a	n/a		
n/a	Gambia	n/a	n/a	n/a		
n/a	Guyana	n/a	n/a	n/a		
n/a	Honduras	n/a	n/a	n/a		
n/a	Iran, Islamic Rep.	n/a	n/a	n/a		
n/a	Kuwait	n/a	n/a	n/a		
n/a	Lebanon	n/a	n/a	n/a		
n/a	Mali	n/a	n/a	n/a		
n/a	Mongolia	n/a	n/a	n/a		
n/a	Mozambique	n/a	n/a	n/a		
n/a	Myanmar	n/a	n/a	n/a		
n/a	Nicaragua	n/a	n/a	n/a		
n/a	Paraguay	n/a	n/a	n/a		
n/a	Saudi Arabia	n/a	n/a	n/a		
n/a	Seychelles	n/a	n/a	n/a		
n/a	Sudan	n/a	n/a	n/a		
n/a	Swaziland	n/a	n/a	n/a		
n/a	Tanzania, United Rep.	n/a	n/a	n/a		
n/a	Trinidad and Tobago	n/a	n/a	n/a		
n/a	United States of America	n/a	n/a	n/a		
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a		
n/a	Viet Nam	n/a	n/a	n/a		
n/a	Yemen	n/a	n/a	n/a		
n/a	Zimbabwe	n/a	n/a	n/a		

SOURCE: World Bank, *Doing Business 2014, Entrepreneurship*

NOTE: ● indicates a strength; ○ a weakness

6.2.3 Total computer software spending

Total computer software spending (% of GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	United States of America	1.00	100.00	1.00	●
2	Switzerland	0.78	75.85	0.99	●
3	Canada	0.78	75.26	0.97	●
4	Ireland	0.75	72.07	0.96	
5	United Kingdom	0.70	66.44	0.95	
6	Belgium	0.69	65.35	0.93	●
7	Netherlands	0.66	62.07	0.92	
8	Turkey	0.66	62.06	0.90	●
9	Spain	0.65	61.47	0.89	●
10	Portugal	0.65	61.29	0.88	
11	Italy	0.62	57.37	0.86	●
12	Denmark	0.61	57.31	0.85	
13	Austria	0.61	57.21	0.84	
14	France	0.61	56.81	0.82	
15	Sweden	0.60	55.53	0.81	
16	Greece	0.60	55.34	0.79	
17	Norway	0.59	54.27	0.78	
18	Germany	0.58	53.03	0.77	
19	Finland	0.58	52.96	0.75	
20	Malaysia	0.41	34.39	0.74	
21	Singapore	0.38	31.26	0.73	
22	Zimbabwe	0.38	31.17	0.71	●
23	China	0.38	31.17	0.70	
24	Hong Kong (China)	0.37	30.26	0.68	
25	South Africa	0.36	29.00	0.67	
26	Thailand	0.34	27.16	0.66	
27	Bahrain	0.34	26.24	0.64	
28	Jamaica	0.34	26.20	0.63	●
29	Saudi Arabia	0.33	25.23	0.62	
30	Sri Lanka	0.32	24.83	0.60	
31	Viet Nam	0.32	24.79	0.59	
32	Korea, Rep.	0.32	24.14	0.58	
33	New Zealand	0.32	23.89	0.56	
34	Czech Republic	0.31	23.38	0.55	
35	Slovakia	0.31	23.10	0.53	
36	Tunisia	0.31	22.98	0.52	
37	Romania	0.30	22.29	0.51	
38	Japan	0.30	22.29	0.49	
39	Israel	0.30	22.06	0.48	
40	Bulgaria	0.29	21.51	0.47	
41	Hungary	0.29	21.46	0.45	
42	Kuwait	0.29	21.20	0.44	
43	Jordan	0.29	21.10	0.42	
44	Indonesia	0.29	21.08	0.41	
45	Chile	0.29	20.74	0.40	
46	Australia	0.28	20.40	0.38	○
47	Ukraine	0.28	20.26	0.37	
48	Costa Rica	0.28	20.21	0.36	
49	Brazil	0.28	20.16	0.34	
50	Poland	0.28	19.93	0.33	
51	Pakistan	0.28	19.60	0.32	
52	Honduras	0.28	19.60	0.30	
53	Philippines	0.27	18.97	0.29	
54	Russian Federation	0.26	18.19	0.27	○
55	Iran, Islamic Rep.	0.26	17.80	0.26	
56	Morocco	0.26	17.72	0.25	
57	Peru	0.26	17.42	0.23	
58	Qatar	0.26	17.24	0.22	
59	United Arab Emirates	0.25	17.08	0.21	○
60	Senegal	0.25	16.81	0.19	
61	Uruguay	0.25	16.73	0.18	○
62	Panama	0.25	16.58	0.16	
63	Bolivia, Plurinational St.	0.25	16.17	0.15	
64	Colombia	0.24	15.98	0.14	○
65	Egypt	0.24	15.86	0.12	○
66	Ecuador	0.24	15.65	0.11	○
67	Kenya	0.24	15.34	0.10	○
68	India	0.23	14.74	0.08	○
69	Venezuela, Bolivarian Rep.	0.23	14.60	0.07	
70	Mexico	0.23	14.01	0.05	○
71	Argentina	0.20	10.74	0.04	○
72	Bangladesh	0.19	9.70	0.03	○
73	Cameroon	0.18	9.38	0.01	○
74	Nigeria	0.10	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Algeria	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Armenia	n/a	n/a	n/a	
n/a	Azerbaijan	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Belarus	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Croatia	n/a	n/a	n/a	
n/a	Cyprus	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Estonia	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Georgia	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Iceland	n/a	n/a	n/a	
n/a	Kazakhstan	n/a	n/a	n/a	
n/a	Kyrgyzstan	n/a	n/a	n/a	
n/a	Latvia	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Lithuania	n/a	n/a	n/a	
n/a	Luxembourg	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Malta	n/a	n/a	n/a	
n/a	Mauritius	n/a	n/a	n/a	
n/a	Moldova, Rep.	n/a	n/a	n/a	
n/a	Mongolia	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Serbia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Slovenia	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	TFYR of Macedonia	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	

SOURCE: IHS Global Insight, *Information and Communication Technology Database*; International Monetary Fund *World Economic Outlook 2014* (GDP)

NOTE: ● indicates a strength; ○ a weakness

6.2.4 ISO 9001 quality certificates

ISO 9001 Quality management systems—Requirements: Number of certificates issued (per billion PPP$ GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Italy	76.43	100.00	0.99	●
1	Romania	49.04	100.00	0.99	●
3	Bulgaria	43.14	87.97	0.99	●
4	Czech Republic	41.72	85.07	0.98	●
5	Israel	34.83	71.02	0.97	●
6	Malta	34.28	69.90	0.96	●
7	Slovenia	33.95	69.23	0.96	●
8	Hungary	30.67	62.54	0.95	●
9	Croatia	30.10	61.39	0.94	●
10	Spain	28.00	57.09	0.94	●
11	Estonia	27.21	55.49	0.93	●
12	Slovakia	26.37	53.77	0.92	●
13	Switzerland	26.33	53.69	0.91	
14	Greece	26.23	53.49	0.91	●
15	Portugal	25.71	52.43	0.90	●
16	Serbia	24.68	50.33	0.89	●
17	Colombia	22.19	45.26	0.89	●
18	Bosnia and Herzegovina	21.33	43.50	0.88	●
19	China	20.84	42.49	0.87	
20	Latvia	19.89	40.57	0.86	●
21	United Kingdom	18.20	37.11	0.86	
22	Malaysia	17.30	35.29	0.85	
23	Germany	15.60	31.80	0.84	
24	Cyprus	15.45	31.50	0.84	
25	TFYR of Macedonia	15.21	31.01	0.83	●
26	Netherlands	14.63	29.83	0.82	
27	Lithuania	14.56	29.69	0.81	
28	Singapore	13.82	28.17	0.81	
29	Finland	13.01	26.53	0.80	
30	Montenegro	12.94	26.38	0.79	●
31	Australia	12.48	25.46	0.79	
32	Uruguay	12.46	25.41	0.78	●
33	Viet Nam	11.99	24.45	0.77	●
34	Austria	11.94	24.34	0.76	
35	France	11.68	23.81	0.76	
36	Poland	11.56	23.57	0.75	
37	Ireland	11.20	22.83	0.74	
38	Chile	10.70	21.81	0.74	
39	Sweden	10.66	21.75	0.73	
40	Barbados	10.30	21.01	0.72	
41	Mauritius	10.05	20.48	0.71	
42	Japan	9.82	20.02	0.71	
43	Lebanon	9.77	19.93	0.70	
44	Thailand	9.23	18.82	0.69	
45	Belgium	8.12	16.55	0.69	
46	New Zealand	8.08	16.48	0.68	
47	Ecuador	7.99	16.29	0.67	●
48	Moldova, Rep.	7.19	14.66	0.66	
49	Argentina	7.14	14.55	0.66	
50	Tunisia	7.00	14.27	0.65	
51	Brazil	6.89	14.05	0.64	
52	United Arab Emirates	6.78	13.83	0.64	
53	Korea, Rep.	6.69	13.65	0.63	
54	Hong Kong (China)	6.43	13.12	0.62	
55	Denmark	6.27	12.79	0.61	
56	Norway	6.25	12.75	0.61	
57	India	6.02	12.28	0.60	
58	Albania	5.48	11.18	0.59	
59	Canada	5.45	11.12	0.59	
60	Guyana	5.35	10.91	0.58	●
61	Luxembourg	5.26	10.73	0.57	
62	South Africa	5.21	10.63	0.56	
63	Turkey	4.97	10.13	0.56	
64	Bahrain	4.77	9.73	0.55	
65	Kenya	4.76	9.71	0.54	
66	Paraguay	4.70	9.59	0.54	●
67	Iceland	4.65	9.48	0.53	
68	Zimbabwe	4.40	8.97	0.52	●
69	El Salvador	4.02	8.20	0.51	
70	Seychelles	3.91	7.97	0.51	
71	Honduras	3.88	7.91	0.50	
72	Jordan	3.53	7.21	0.49	
73	Cabo Verde	3.44	7.01	0.49	
74	Russian Federation	3.37	6.87	0.48	
75	Bolivia, Plurinational St.	3.32	6.76	0.47	
76	Sri Lanka	3.29	6.70	0.46	
77	Ukraine	3.25	6.63	0.46	
78	Costa Rica	3.23	6.58	0.45	
79	Indonesia	3.14	6.41	0.44	
80	Oman	3.03	6.18	0.44	
81	Philippines	3.01	6.15	0.43	
82	Georgia	2.95	6.02	0.42	
83	Peru	2.91	5.93	0.41	
84	Fiji	2.90	5.91	0.41	
85	Morocco	2.85	5.81	0.40	
86	Pakistan	2.84	5.78	0.39	
87	Mexico	2.60	5.29	0.39	
88	Egypt	2.34	4.78	0.38	
89	Qatar	2.24	4.57	0.37	
90	United States of America	2.08	4.24	0.36	○
91	Panama	2.04	4.17	0.36	
92	Swaziland	2.03	4.15	0.35	
93	Iran, Islamic Rep.	1.97	4.02	0.34	
94	Guatemala	1.83	3.72	0.34	
95	Togo	1.79	3.65	0.33	
96	Nicaragua	1.76	3.60	0.32	
97	Mozambique	1.75	3.57	0.31	
98	Malawi	1.72	3.51	0.31	
99	Senegal	1.67	3.41	0.30	
100	Bhutan	1.66	3.38	0.29	
101	Kuwait	1.65	3.37	0.29	
102	Azerbaijan	1.61	3.29	0.28	
103	Dominican Republic	1.60	3.27	0.27	
104	Burkina Faso	1.58	3.23	0.26	
105	Saudi Arabia	1.52	3.11	0.26	○
106	Madagascar	1.42	2.89	0.25	
107	Namibia	1.36	2.77	0.24	
108	Kazakhstan	1.33	2.72	0.24	
109	Trinidad and Tobago	1.25	2.55	0.23	
110	Venezuela, Bolivarian Rep.	1.11	2.27	0.22	
111	Nepal	1.11	2.25	0.21	
112	Jamaica	1.10	2.24	0.21	○
113	Côte d'Ivoire	1.04	2.13	0.20	
114	Algeria	1.03	2.11	0.19	
115	Gambia	0.99	2.01	0.19	
116	Uganda	0.97	1.97	0.18	
117	Zambia	0.82	1.68	0.17	
118	Belarus	0.78	1.59	0.16	○
119	Armenia	0.73	1.50	0.16	○
120	Sudan	0.69	1.40	0.15	
121	Niger	0.67	1.36	0.14	
122	Mongolia	0.54	1.09	0.14	○
123	Bangladesh	0.53	1.08	0.13	
124	Cameroon	0.51	1.04	0.12	
125	Myanmar	0.51	1.03	0.11	
126	Tanzania, United Rep.	0.48	0.98	0.11	
127	Ghana	0.48	0.98	0.10	○
128	Guinea	0.41	0.83	0.09	
129	Yemen	0.40	0.82	0.09	
130	Uzbekistan	0.40	0.81	0.08	○
131	Cambodia	0.39	0.80	0.07	○
132	Ethiopia	0.38	0.77	0.06	
133	Botswana	0.38	0.77	0.06	○
134	Angola	0.34	0.69	0.05	
135	Kyrgyzstan	0.33	0.67	0.04	○
136	Tajikistan	0.24	0.49	0.04	○
137	Lesotho	0.20	0.40	0.03	○
138	Rwanda	0.17	0.35	0.02	○
139	Mali	0.16	0.32	0.01	○
140	Nigeria	0.09	0.18	0.01	○
141	Burundi	0.00	0.00	0.00	○

SOURCE: International Organization for Standardization, *The ISO Survey of Certifications 2013*; International Monetary Fund World Economic Outlook, 2015 (PPP$ GDP)

NOTE: ● indicates a strength; ○ a weakness

6.2.5 High-tech and medium high-tech output

High-tech and medium-high-tech output (% of total manufactures output) | 2011

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Singapore	69.24	100.00	1.00	●
2	Switzerland (2010)	63.96	92.37	0.99	●
3	Ireland (2010)	57.39	82.88	0.98	●
4	Slovakia	55.80	80.58	0.97	●
5	Germany	55.53	80.18	0.96	●
6	Korea, Rep. (2010)	53.44	77.15	0.95	
7	Czech Republic (2010)	50.24	72.54	0.94	●
8	Hungary	48.72	70.34	0.93	●
9	Slovenia	46.50	67.12	0.92	●
10	Denmark	44.30	63.94	0.91	
11	Thailand (2006)	43.88	63.33	0.90	●
12	Mexico	43.70	63.08	0.89	●
13	Japan (2010)	43.65	63.00	0.88	
14	United States of America (2008)	43.27	62.45	0.87	
15	China	43.13	62.26	0.86	
16	France	43.07	62.16	0.85	
17	United Kingdom	42.90	61.92	0.84	
18	Austria	42.40	61.21	0.83	
19	Malaysia (2010)	42.00	60.62	0.82	
20	Netherlands (2010)	41.24	59.53	0.81	
21	Finland	40.98	59.15	0.80	
22	Brazil	39.81	57.45	0.79	●
23	Estonia	38.21	55.14	0.78	
24	Norway (2010)	37.88	54.66	0.77	
25	Italy (2010)	37.62	54.29	0.76	
26	Romania	35.96	51.89	0.75	
27	Saudi Arabia (2009)	35.85	51.73	0.74	
28	Iran, Islamic Rep. (2010)	35.48	51.20	0.73	●
29	Belgium	34.96	50.45	0.72	
30	Spain	34.77	50.16	0.71	
31	Poland	33.60	48.48	0.70	
32	India (2010)	32.54	46.95	0.69	
33	Tunisia (2007)	32.43	46.78	0.68	●
34	Sweden	31.76	45.82	0.67	
35	Belarus	31.35	45.23	0.66	
36	Indonesia	30.88	44.54	0.65	
37	Israel (2010)	30.76	44.36	0.64	
38	Algeria (2010)	29.07	41.93	0.63	●
39	Canada	28.50	41.10	0.62	
40	Morocco	28.31	40.83	0.61	
41	South Africa (2010)	28.24	40.73	0.60	
42	Turkey (2009)	28.16	40.62	0.59	
43	Portugal	26.96	38.88	0.58	
44	Viet Nam (2008)	26.17	37.73	0.57	
45	Russian Federation	25.97	37.45	0.56	
46	Ukraine	24.92	35.93	0.55	
47	Jordan	24.51	35.34	0.54	
48	Trinidad and Tobago (2006)	24.11	34.76	0.53	
49	Pakistan (2006)	23.71	34.18	0.52	●
50	Colombia	22.06	31.79	0.51	
51	Lebanon (2007)	22.00	31.71	0.50	
52	Chile (2008)	21.73	31.31	0.49	
53	Egypt (2010)	21.45	30.91	0.48	
54	Qatar (2010)	20.78	29.94	0.47	
55	Lithuania	20.64	29.74	0.46	
56	Australia	20.36	29.34	0.45	
57	Serbia	19.71	28.39	0.44	
58	TFYR of Macedonia	19.58	28.21	0.43	
59	Hong Kong (China)	19.43	27.99	0.42	○
60	Bulgaria	18.88	27.19	0.41	
61	Gambia (2004)	16.81	24.20	0.40	
62	Philippines (2008)	16.28	23.44	0.39	
63	Senegal (2010)	15.28	21.99	0.38	
64	Paraguay (2010)	15.11	21.75	0.37	
65	Oman (2010)	14.87	21.40	0.36	
66	New Zealand (2010)	14.80	21.29	0.35	○
67	Latvia	14.11	20.30	0.34	○
68	Greece (2007)	14.08	20.25	0.33	
69	Ecuador (2008)	13.96	20.08	0.32	
70	Cyprus	13.39	19.26	0.31	
71	Georgia	12.92	18.58	0.30	
72	Costa Rica	11.92	17.13	0.29	
73	Azerbaijan	10.95	15.72	0.28	
74	Bangladesh (2006)	10.91	15.67	0.27	
75	Uruguay (2009)	10.90	15.65	0.26	
76	Ethiopia (2009)	10.87	15.61	0.25	
77	Kuwait	10.49	15.07	0.24	
78	Bahrain (2010)	9.93	14.26	0.23	
79	Peru	9.25	13.26	0.22	
80	Mauritius	9.19	13.19	0.21	○
81	Sri Lanka (2010)	8.85	12.70	0.20	
82	Malawi (2010)	8.62	12.37	0.19	
83	Moldova, Rep.	8.29	11.88	0.18	○
84	Kenya	7.74	11.09	0.17	
85	Iceland (2006)	7.13	10.21	0.16	○
86	Fiji (2010)	7.12	10.19	0.15	○
87	Kazakhstan (2007)	6.84	9.79	0.14	○
88	Mongolia	5.53	7.89	0.13	○
89	Panama (2005)	5.23	7.46	0.12	○
90	Cameroon (2008)	5.13	7.32	0.11	
91	Armenia	4.23	6.01	0.10	○
92	Luxembourg	3.43	4.85	0.09	○
93	Kyrgyzstan (2010)	3.26	4.61	0.08	
94	Madagascar (2006)	2.42	3.39	0.07	
95	Tajikistan (2008)	2.40	3.36	0.06	
96	Yemen (2009)	1.88	2.61	0.05	
97	Burundi (2010)	1.84	2.56	0.04	
98	Nepal (2008)	1.36	1.86	0.03	○
99	Albania	1.00	1.34	0.02	○
100	Malta (2009)	0.32	0.36	0.01	○
101	Tanzania, United Rep. (2010)	0.07	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Argentina	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Croatia	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: United Nations Industrial Development Organization *Industrial Statistics Database* INDSTAT4 2012; OECD 'ISIC REV. 3 Tech. Intensity Def.' (2004–11)

NOTE: ● indicates a strength; ○ a weakness

6.3.1 Royalties and license fees receipts

Royalty and license fees, receipts (% of total trade) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Switzerland (2012)	7.15	100.00	1.00	●
2	Netherlands	5.31	93.11	0.99	●
3	United States of America	5.13	92.36	0.98	●
4	Finland	3.55	83.91	0.97	
5	Japan	3.53	83.82	0.96	●
6	Paraguay (2008)	3.09	80.75	0.96	●
7	Sweden	2.60	76.85	0.95	
8	Ireland	2.53	76.25	0.94	
9	Rwanda (2011)	2.02	71.23	0.93	●
10	Iceland (2012)	1.72	67.63	0.92	
11	United Kingdom	1.65	66.75	0.91	
12	France	1.43	63.62	0.90	●
13	Denmark	1.38	62.84	0.89	
14	Israel (2012)	1.07	57.23	0.89	
15	Germany	1.06	57.19	0.88	
16	Hungary	1.00	55.95	0.87	●
17	Luxembourg	0.87	52.93	0.86	
18	Belgium	0.77	50.29	0.85	
19	Canada	0.67	47.47	0.84	
20	Italy	0.65	46.87	0.83	
21	Korea, Rep.	0.63	46.34	0.82	
22	New Zealand	0.59	44.98	0.82	
23	Mexico	0.57	44.11	0.81	●
24	Austria	0.46	40.19	0.80	
25	Yemen (2009)	0.40	37.27	0.79	●
26	Singapore	0.38	36.57	0.78	
27	El Salvador	0.34	34.50	0.77	●
28	Guyana	0.28	30.84	0.76	●
29	Egypt (2007)	0.25	29.27	0.75	●
30	Norway	0.25	29.12	0.75	
31	Madagascar (2012)	0.25	29.09	0.74	●
32	Australia	0.23	27.99	0.73	
33	Kenya (2012)	0.23	27.80	0.72	
34	Uganda	0.22	27.14	0.71	●
35	Malta	0.22	27.13	0.70	
36	Spain	0.22	26.86	0.69	
37	Serbia	0.21	26.04	0.68	
38	Brazil	0.20	25.36	0.68	
39	Bosnia and Herzegovina	0.20	25.34	0.67	
40	Ukraine	0.18	23.97	0.66	
41	Czech Republic	0.16	22.51	0.65	
42	Barbados (2010)	0.16	22.44	0.64	
43	Slovenia	0.16	22.42	0.63	
44	Seychelles (2012)	0.15	21.55	0.62	
45	Romania	0.15	21.49	0.61	
46	Russian Federation	0.14	20.14	0.61	
47	TFYR of Macedonia	0.13	19.62	0.60	
48	Argentina	0.13	19.60	0.59	
49	Poland	0.13	19.40	0.58	
50	Moldova, Rep.	0.12	18.68	0.57	
51	Latvia	0.10	16.34	0.56	
52	Croatia	0.10	16.21	0.55	
53	Colombia	0.10	15.91	0.54	
54	Guatemala	0.10	15.81	0.54	
55	Tunisia (2012)	0.10	15.59	0.53	
56	Hong Kong (China) (2012)	0.09	15.15	0.52	
57	India	0.09	14.50	0.51	
58	Chile	0.09	14.37	0.50	
59	Jamaica	0.08	14.03	0.49	
60	Greece	0.08	13.92	0.48	
61	Thailand	0.08	13.55	0.47	
62	Bolivia, Plurinational St. (2012)	0.08	13.35	0.46	
63	Bulgaria	0.07	12.57	0.46	
64	Senegal (2012)	0.06	11.31	0.45	
65	Belarus	0.06	10.97	0.44	
66	Lithuania	0.06	10.92	0.43	
67	Swaziland (2012)	0.06	10.69	0.42	
68	Kyrgyzstan (2012)	0.06	10.43	0.41	
69	South Africa	0.06	10.16	0.40	
70	Estonia	0.05	9.69	0.39	○
71	Mauritius	0.05	8.64	0.39	
72	Panama	0.04	8.58	0.38	
73	Portugal	0.04	8.39	0.37	○
74	Malaysia	0.04	8.17	0.36	○
75	Georgia	0.04	7.92	0.35	
76	China	0.04	7.58	0.34	
77	Mozambique (2012)	0.04	7.39	0.33	
78	Montenegro	0.03	6.43	0.32	
79	Zimbabwe (2012)	0.03	5.37	0.32	
80	Indonesia	0.02	5.01	0.31	
81	Peru (2012)	0.02	4.81	0.30	
82	Cambodia	0.02	4.72	0.29	
83	Angola (2008)	0.02	4.71	0.28	●
84	Sudan (2011)	0.02	4.70	0.27	●
85	Costa Rica	0.02	4.55	0.26	
86	Albania	0.02	4.41	0.25	
87	Burkina Faso (2012)	0.02	4.32	0.25	
88	Pakistan	0.02	3.34	0.24	
89	Tajikistan (2012)	0.01	3.13	0.23	
90	Cyprus	0.01	3.06	0.22	○
91	Mongolia	0.01	3.04	0.21	
92	Iran, Islamic Rep. (2012)	0.01	2.59	0.20	
93	Mali (2011)	0.01	2.54	0.19	
94	Guinea (2008)	0.01	1.38	0.18	
95	Lebanon (2012)	0.01	1.11	0.18	○
96	Slovakia	0.00	1.08	0.17	○
97	Algeria (2012)	0.00	0.92	0.16	
98	Philippines	0.00	0.91	0.15	
99	Ethiopia (2010)	0.00	0.77	0.14	
100	Uruguay	0.00	0.67	0.13	○
101	Morocco	0.00	0.59	0.12	○
102	Cameroon (2012)	0.00	0.55	0.11	
103	Fiji (2012)	0.00	0.49	0.11	○
104	Trinidad and Tobago (2011)	0.00	0.49	0.10	○
105	Bhutan	0.00	0.48	0.09	
106	Botswana (2012)	0.00	0.46	0.08	○
107	Côte d'Ivoire (2009)	0.00	0.26	0.07	○
108	Burundi (2012)	0.00	0.16	0.06	
109	Togo (2010)	0.00	0.16	0.05	
110	Bangladesh (2012)	0.00	0.15	0.04	○
111	Kazakhstan	0.00	0.06	0.04	○
112	Namibia (2011)	0.00	0.02	0.03	○
113	Niger (2007)	0.00	0.02	0.02	○
114	Azerbaijan (2012)	0.00	0.00	0.01	○
115	Cabo Verde (2012)	0.00	0.00	0.00	○
n/a	Armenia	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Qatar	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Sri Lanka	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	Turkey	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Viet Nam	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	

SOURCE: World Trade Organization, *Trade in Commercial Services* database, based on the International Monetary Fund *Balance of Payments* database

NOTE: ● indicates a strength; ○ a weakness

6.3.2 High-tech exports

High-tech net exports (% of total trade) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	China	28.37	100.00	0.98	●
1	Malaysia	27.82	100.00	0.98	●
1	Singapore	26.81	100.00	0.98	●
1	Viet Nam	23.58	100.00	0.98	●
5	Korea, Rep.	22.08	93.66	0.97	
6	Panama (2011)	18.36	77.87	0.96	●
7	Switzerland	17.06	72.36	0.95	
8	Costa Rica	16.77	71.12	0.95	●
9	Czech Republic	16.29	69.10	0.94	●
10	Mexico	14.42	61.15	0.93	●
11	Hungary	14.34	60.81	0.92	●
12	France	14.27	60.52	0.91	●
13	Netherlands	13.26	56.22	0.91	
14	Thailand	13.18	55.92	0.90	●
15	Israel	12.62	53.52	0.89	
16	Japan	12.40	52.58	0.88	
17	Germany	11.99	50.87	0.88	
18	Malta	11.80	50.03	0.87	
19	Estonia	11.56	49.01	0.86	
20	Ireland	11.27	47.81	0.85	
21	Belgium	10.00	42.43	0.84	
22	Sweden	9.43	40.01	0.84	
23	United Kingdom	9.38	39.79	0.83	
24	Austria	9.01	38.23	0.82	
25	Slovakia	8.98	38.10	0.81	●
26	United States of America	6.78	28.74	0.80	
27	Denmark	5.89	24.99	0.80	
28	Latvia	5.83	24.74	0.79	
29	Canada	5.75	24.39	0.78	
30	Poland	5.63	23.88	0.77	
31	Italy	5.26	22.31	0.77	
32	Lithuania	4.79	20.33	0.76	
33	Slovenia	4.56	19.33	0.75	
34	Romania	4.49	19.03	0.74	
35	Finland	4.47	18.97	0.73	
36	Kazakhstan	4.15	17.60	0.73	
37	Croatia	4.08	17.29	0.72	
38	Spain	3.88	16.45	0.71	
39	India	3.48	14.78	0.70	●
40	Tunisia	3.34	14.17	0.70	●
41	Norway	3.20	13.56	0.69	
42	Bulgaria	3.13	13.27	0.68	
43	Indonesia	3.11	13.21	0.67	
44	Brazil	3.01	12.75	0.66	
45	Argentina	2.65	11.23	0.66	
46	El Salvador	2.63	11.15	0.65	●
47	Ukraine	2.42	10.25	0.64	
48	Portugal	2.39	10.13	0.63	
49	South Africa	2.31	9.78	0.63	
50	Serbia	2.03	8.63	0.62	
51	TFYR of Macedonia	1.91	8.10	0.61	
52	Belarus	1.75	7.43	0.60	
53	Russian Federation	1.72	7.31	0.59	
54	Australia	1.71	7.24	0.59	
55	New Zealand	1.48	6.29	0.58	
56	Greece	1.42	6.00	0.57	
57	Uruguay	1.38	5.84	0.56	
58	Guatemala	1.36	5.75	0.55	
59	Iceland	1.21	5.14	0.55	
60	Colombia	1.15	4.90	0.54	
61	Dominican Republic	1.14	4.83	0.53	
62	Namibia	1.14	4.81	0.52	
63	Turkey	1.11	4.71	0.52	
64	Malawi	1.03	4.39	0.51	
65	Luxembourg	0.95	4.03	0.50	
66	Bosnia and Herzegovina	0.93	3.93	0.49	
67	Pakistan	0.93	3.92	0.48	
68	Côte d'Ivoire	0.87	3.68	0.48	●
69	Mozambique	0.83	3.54	0.47	●
70	Cambodia	0.74	3.13	0.46	
71	Chile	0.68	2.87	0.45	
72	Cyprus	0.61	2.57	0.45	
73	Zambia	0.58	2.46	0.44	
74	Kenya	0.56	2.38	0.43	
75	Iran, Islamic Rep.	0.53	2.26	0.42	
76	Paraguay	0.48	2.04	0.41	
77	Tanzania, United Rep.	0.46	1.94	0.41	
78	Jordan	0.43	1.83	0.40	
79	Peru	0.41	1.76	0.39	
80	Zimbabwe	0.41	1.74	0.38	
81	Sri Lanka	0.40	1.68	0.38	
82	Bolivia, Plurinational St.	0.38	1.60	0.37	
83	Mongolia	0.36	1.53	0.36	
84	Honduras	0.36	1.52	0.35	
85	Moldova, Rep.	0.34	1.45	0.34	
86	Botswana	0.32	1.37	0.34	
87	Ghana	0.32	1.36	0.33	
88	Oman	0.32	1.34	0.32	
89	Montenegro	0.29	1.22	0.31	
90	Georgia	0.29	1.22	0.30	
91	Ecuador	0.27	1.15	0.30	
92	Azerbaijan	0.27	1.13	0.29	
93	Armenia	0.23	0.99	0.28	
94	Albania	0.19	0.82	0.27	
95	Burundi	0.16	0.67	0.27	
96	Niger	0.15	0.63	0.26	
97	Senegal	0.15	0.62	0.25	
98	Kyrgyzstan	0.15	0.62	0.24	
99	Uganda	0.15	0.62	0.23	
100	Lebanon	0.14	0.61	0.23	
101	Rwanda	0.14	0.61	0.22	
102	Bangladesh	0.14	0.59	0.21	
103	Egypt	0.13	0.56	0.20	
104	Nicaragua	0.11	0.49	0.20	
105	Kuwait	0.11	0.47	0.19	
106	Hong Kong (China)	0.11	0.47	0.18	○
107	Mali	0.11	0.46	0.17	
108	Nigeria	0.11	0.46	0.16	
109	Fiji	0.11	0.45	0.16	○
110	Burkina Faso	0.10	0.43	0.15	
111	Saudi Arabia	0.10	0.41	0.14	○
112	Ethiopia	0.09	0.40	0.13	
113	Mauritius	0.09	0.39	0.13	○
114	United Arab Emirates	0.09	0.38	0.12	○
115	Jamaica	0.07	0.31	0.11	○
116	Madagascar	0.06	0.26	0.10	
117	Sudan	0.05	0.19	0.09	
118	Togo	0.04	0.17	0.09	
119	Nepal	0.04	0.17	0.08	○
120	Trinidad and Tobago	0.03	0.14	0.07	○
121	Yemen	0.02	0.10	0.06	
122	Gambia	0.02	0.06	0.05	○
123	Bahrain	0.01	0.04	0.05	○
124	Bhutan	0.01	0.03	0.04	○
125	Cabo Verde	0.01	0.03	0.03	○
126	Algeria	0.00	0.02	0.02	○
127	Guyana	0.00	0.01	0.02	○
128	Myanmar	0.00	0.00	0.01	○
129	Qatar	0.00	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Morocco	n/a	n/a	n/a	
n/a	Philippines	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	

SOURCE: United Nations, *COMTRADE* database; Eurostat *'High-technology' aggregations based on SITC Rev. 4*; WTO *Trade in Commercial Services* database

NOTE: ● indicates a strength; ○ a weakness

6.3.3 Communications, computer and information services exports

Communications, computer and information services exports (% of total trade) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Costa Rica	11.12	100.00	0.97	●
1	Gambia (2009)	5.99	100.00	0.97	●
1	India	10.12	100.00	0.97	●
1	Ireland	25.08	100.00	0.97	●
5	Finland	5.96	99.62	0.97	
6	Israel (2012)	4.95	82.42	0.96	●
7	Luxembourg	4.73	78.81	0.95	
8	Sweden	4.69	78.14	0.94	
9	Senegal (2012)	4.61	76.76	0.93	●
10	Philippines	4.56	75.96	0.92	●
11	Moldova, Rep.	4.06	67.54	0.92	●
12	Sri Lanka	3.94	65.45	0.91	●
13	Togo (2008)	3.80	63.11	0.90	●
14	United Kingdom	3.46	57.34	0.89	
15	Kenya (2012)	3.39	56.17	0.88	●
16	Albania	3.35	55.56	0.87	●
17	Mali (2008)	3.34	55.37	0.86	●
18	Romania	3.31	54.85	0.86	●
19	Cabo Verde	2.86	47.19	0.85	●
20	Austria	2.78	45.95	0.84	
21	Armenia	2.76	45.62	0.83	●
22	Serbia	2.73	45.11	0.82	●
23	Morocco (2012)	2.69	44.30	0.81	●
24	Belgium	2.67	43.98	0.81	
25	Estonia	2.63	43.34	0.80	
26	Tajikistan (2012)	2.63	43.33	0.79	●
27	Mauritius	2.62	43.22	0.78	
28	TFYR of Macedonia	2.55	41.95	0.77	●
29	Nicaragua	2.41	39.66	0.76	●
30	Honduras	2.31	37.97	0.75	●
31	Burkina Faso (2012)	2.29	37.67	0.75	●
32	Spain	2.26	37.13	0.74	
33	Guatemala	2.26	37.07	0.73	●
34	Pakistan	2.25	36.97	0.72	●
35	Germany	2.18	35.72	0.71	
36	Ukraine	2.16	35.45	0.70	
37	Latvia	2.14	35.02	0.69	
38	Bulgaria	2.05	33.61	0.69	
39	Montenegro	2.04	33.33	0.68	
40	Netherlands	2.01	32.96	0.67	
41	Croatia	1.96	32.05	0.66	
42	Guinea (2012)	1.96	32.05	0.65	●
43	Argentina	1.94	31.74	0.64	
44	France	1.88	30.68	0.64	
45	Egypt (2012)	1.87	30.47	0.63	●
46	Denmark	1.82	29.60	0.62	
47	Barbados (2010)	1.81	29.47	0.61	
48	Slovenia	1.75	28.51	0.60	
49	El Salvador	1.74	28.25	0.59	
50	Uganda	1.73	28.23	0.58	
51	Czech Republic	1.72	28.02	0.58	
52	Canada	1.71	27.75	0.57	○
53	Madagascar (2012)	1.69	27.55	0.56	
54	Belarus	1.67	27.17	0.55	
55	Ethiopia (2012)	1.66	26.91	0.54	●
56	Tunisia (2012)	1.58	25.60	0.53	
57	Greece	1.55	25.12	0.53	
58	Italy	1.55	25.11	0.52	
59	Uruguay	1.53	24.70	0.51	
60	Portugal	1.52	24.57	0.50	
61	Norway	1.52	24.53	0.49	○
62	Seychelles (2006)	1.45	23.36	0.48	
63	Poland	1.44	23.32	0.47	
64	Hungary	1.41	22.72	0.47	
65	Dominican Republic (2012)	1.34	21.57	0.46	
66	Lebanon (2012)	1.33	21.47	0.45	
67	United States of America	1.33	21.33	0.44	
68	Panama	1.31	21.03	0.43	
69	Bangladesh (2012)	1.30	20.87	0.42	
70	Malta	1.28	20.58	0.42	
71	Cameroon (2012)	1.25	19.98	0.41	
72	Iceland (2012)	1.24	19.81	0.40	○
73	Malawi (2012)	1.24	19.80	0.39	
74	Cyprus	1.22	19.46	0.38	
75	Malaysia	1.18	18.93	0.37	
76	New Zealand	1.15	18.37	0.36	○
77	Bolivia, Plurinational St. (2012)	1.05	16.61	0.36	
78	Rwanda (2012)	0.96	15.14	0.35	
79	Australia	0.95	14.95	0.34	○
80	Côte d'Ivoire (2010)	0.91	14.31	0.33	
81	Fiji (2012)	0.90	14.22	0.32	
82	Russian Federation	0.82	12.71	0.31	
83	Jamaica	0.78	12.17	0.31	
84	Slovakia	0.77	12.03	0.30	○
85	Cambodia	0.75	11.60	0.29	
86	China	0.74	11.44	0.28	
87	Georgia	0.71	10.94	0.27	
88	Niger (2009)	0.71	10.88	0.26	
89	Guyana	0.70	10.75	0.25	
90	Singapore (2008)	0.65	9.98	0.25	○
91	Lithuania	0.58	8.77	0.24	○
92	Indonesia	0.50	7.39	0.23	
93	Hong Kong (China) (2012)	0.49	7.24	0.22	○
94	Zambia (2008)	0.45	6.52	0.21	
95	Mozambique (2012)	0.44	6.44	0.20	
96	Tanzania, United Rep. (2012)	0.44	6.38	0.19	
97	Kyrgyzstan	0.43	6.29	0.19	
98	South Africa	0.43	6.17	0.18	○
99	Azerbaijan	0.42	6.01	0.17	
100	Colombia	0.42	5.97	0.16	○
101	Chile (2012)	0.40	5.78	0.15	○
102	Peru (2012)	0.39	5.51	0.14	○
103	Algeria (2012)	0.39	5.46	0.14	
104	Swaziland (2012)	0.36	5.07	0.13	
105	Japan	0.30	4.08	0.12	○
106	Korea, Rep.	0.28	3.73	0.11	○
107	Lesotho (2011)	0.27	3.45	0.10	
108	Sudan (2012)	0.26	3.30	0.09	
109	Brazil	0.25	3.22	0.08	○
110	Mongolia	0.20	2.39	0.08	○
111	Kazakhstan	0.20	2.37	0.07	○
112	Thailand	0.19	2.20	0.06	○
113	Venezuela, Bolivarian Rep. (2012)	0.18	1.91	0.05	
114	Iran, Islamic Rep. (2012)	0.17	1.85	0.04	○
115	Turkey	0.17	1.78	0.03	○
116	Namibia	0.16	1.68	0.03	○
117	Paraguay	0.10	0.61	0.02	○
118	Botswana (2012)	0.10	0.60	0.01	○
119	Trinidad and Tobago (2011)	0.06	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Mexico	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Qatar	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Switzerland	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Viet Nam	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: World Trade Organization, *Trade in Commercial Services* database, based on the International Monetary Fund *Balance of Payments* database

NOTE: ● indicates a strength; ○ a weakness

6.3.4 Foreign direct investment net outflows

Foreign direct investment (FDI), net outflows (% of GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Hong Kong (China)	33.40	100.00	0.97	●
1	Ireland	16.20	100.00	0.97	●
1	Luxembourg	610.05	100.00	0.97	●
1	Mauritius	210.16	100.00	0.97	●
1	Singapore	9.05	100.00	0.97	●
6	Switzerland	8.28	94.44	0.96	
7	Barbados (2010)	7.66	90.03	0.95	●
8	Kuwait	5.50	74.46	0.94	●
9	Netherlands	4.90	70.14	0.93	
10	Angola	4.87	69.91	0.93	●
11	Trinidad and Tobago (2011)	4.48	67.11	0.92	●
12	Malaysia	4.15	64.76	0.91	
13	Russian Federation	4.14	64.65	0.90	●
14	Iceland	4.07	64.18	0.89	
15	Qatar	3.95	63.29	0.89	
16	Chile	3.94	63.24	0.88	●
17	Austria	3.84	62.49	0.87	
18	Sweden	3.49	60.04	0.86	
19	Mozambique	3.34	58.93	0.85	●
20	Denmark	3.23	58.11	0.84	
21	Bahrain	3.20	57.91	0.84	●
22	Malta	2.77	54.85	0.83	
23	Japan	2.77	54.85	0.82	
24	Portugal	2.70	54.32	0.81	
25	Lebanon	2.69	54.26	0.80	●
26	Canada	2.49	52.82	0.80	
27	United States of America	2.43	52.41	0.79	
28	Togo (2010)	2.40	52.20	0.78	●
29	Spain	2.29	51.40	0.77	
30	Norway	2.25	51.11	0.76	
31	Korea, Rep.	2.24	50.98	0.75	
32	Germany	2.17	50.51	0.75	
33	Colombia	2.02	49.44	0.74	
34	Azerbaijan	2.01	49.35	0.73	●
35	Cyprus	1.78	47.68	0.72	
36	China	1.76	47.58	0.71	
37	Thailand	1.74	47.41	0.70	
38	Oman	1.74	47.39	0.70	
39	Costa Rica	1.63	46.65	0.69	
40	Israel	1.61	46.46	0.68	
41	Panama	1.60	46.38	0.67	
42	Czech Republic	1.58	46.28	0.66	
43	South Africa	1.58	46.27	0.66	
44	Estonia	1.47	45.45	0.65	
45	Philippines	1.40	44.98	0.64	
46	Latvia	1.33	44.48	0.63	
47	Italy	1.33	44.48	0.62	
48	Malawi (2012)	1.17	43.35	0.61	●
49	Bulgaria	1.17	43.29	0.61	
50	Viet Nam	1.14	43.11	0.60	
51	Slovakia	1.13	43.04	0.59	
52	Indonesia	1.11	42.87	0.58	
53	Mexico	1.05	42.43	0.57	
54	Nicaragua	0.92	41.55	0.57	●
55	Kazakhstan	0.84	40.94	0.56	
56	Serbia	0.75	40.30	0.55	
57	Georgia	0.75	40.26	0.54	
58	Lesotho	0.74	40.19	0.53	●
59	Cabo Verde	0.68	39.76	0.52	●
60	Zambia	0.67	39.74	0.52	
61	Saudi Arabia	0.66	39.65	0.51	
62	Slovenia	0.62	39.35	0.50	
63	Lithuania	0.61	39.30	0.49	
64	Brazil	0.59	39.18	0.48	
65	Seychelles	0.55	38.85	0.48	
66	Moldova, Rep.	0.52	38.66	0.47	
67	Morocco	0.43	37.98	0.46	
68	Montenegro	0.40	37.78	0.45	
69	TFYR of Macedonia	0.39	37.73	0.44	
70	Turkey	0.38	37.62	0.43	
71	Venezuela, Bolivarian Rep. (2012)	0.38	37.62	0.43	
72	Belarus	0.37	37.53	0.42	
73	Mongolia	0.36	37.49	0.41	
74	Nigeria (2012)	0.33	37.29	0.40	
75	Senegal (2011)	0.33	37.26	0.39	
76	Cambodia	0.30	37.08	0.39	
77	Uganda	0.28	36.92	0.38	
78	United Kingdom	0.26	36.80	0.37	○
79	El Salvador	0.25	36.67	0.36	
80	Ukraine	0.24	36.64	0.35	
81	Albania	0.22	36.47	0.34	
82	Namibia	0.20	36.31	0.34	
83	Honduras	0.19	36.28	0.33	
84	Argentina	0.18	36.19	0.32	
85	Armenia	0.18	36.19	0.31	
86	Côte d'Ivoire (2010)	0.18	36.17	0.30	
87	Guatemala	0.14	35.90	0.30	
88	Bosnia and Herzegovina	0.13	35.80	0.29	
89	Fiji	0.12	35.77	0.28	
90	Pakistan	0.10	35.63	0.27	
91	Sri Lanka	0.10	35.60	0.26	
92	India	0.09	35.58	0.25	
93	Egypt (2012)	0.08	35.48	0.25	
94	Peru	0.07	35.39	0.24	
95	Jordan	0.05	35.24	0.23	○
96	Mali (2011)	0.04	35.20	0.22	
97	Uruguay	0.04	35.15	0.21	
98	Kenya (2012)	0.03	35.13	0.20	
99	Swaziland	0.01	34.96	0.20	
100	Burkina Faso (2010)	0.01	34.95	0.19	
101	Burundi	0.01	34.94	0.18	
102	Niger (2012)	0.01	34.94	0.17	
103	Bangladesh	0.00	34.92	0.16	
104	Ghana	0.00	34.91	0.16	
105	Bolivia, Plurinational St. (2011)	0.00	34.91	0.15	○
106	Kyrgyzstan	0.00	34.90	0.14	
107	Guinea	0.00	34.89	0.13	
108	Botswana	0.00	34.87	0.12	○
109	France	−0.01	34.80	0.11	○
110	Romania	−0.03	34.66	0.11	○
111	Finland	−0.10	34.19	0.10	○
112	Paraguay	−0.13	34.00	0.09	
113	Algeria	−0.13	33.97	0.08	
114	Australia	−0.27	32.95	0.07	○
115	Greece	−0.29	32.83	0.07	○
116	Croatia	−0.31	32.66	0.06	○
117	Jamaica	−0.60	30.55	0.05	○
118	Dominican Republic	−0.64	30.31	0.04	○
119	Poland	−0.82	29.04	0.03	○
120	New Zealand	−0.85	28.77	0.02	○
121	Cameroon	−1.28	25.67	0.02	○
122	Hungary	−2.59	16.28	0.01	○
123	Belgium	−4.85	0.00	0.00	○
n/a	Bhutan	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	Tunisia	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: International Monetary Fund (with World Bank and OECD GDP estimates), extracted from World Bank *World Development Indicators* database

NOTE: ● indicates a strength; ○ a weakness

7.1.1 National office resident trademark applications

Number of trademark applications issued to residents by the national office (per billion PPP$ GDP) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Moldova, Rep.	176.73	100.00	0.99	●
1	Paraguay (2010)	296.27	100.00	0.99	●
3	Mongolia	135.17	76.12	0.98	●
4	Malta	132.50	74.59	0.97	●
5	Turkey	130.49	73.43	0.96	●
6	Luxembourg	122.36	68.76	0.95	
7	France	120.99	67.98	0.94	●
8	Slovenia (2010)	111.61	62.59	0.93	●
9	Bulgaria	111.48	62.51	0.92	●
10	Czech Republic	109.54	61.40	0.91	●
11	China	107.18	60.04	0.90	
12	Costa Rica (2012)	101.01	56.49	0.89	●
13	Iceland	98.51	55.06	0.88	
14	Belarus	97.00	54.19	0.87	●
15	New Zealand	95.16	53.14	0.86	
16	Korea, Rep.	93.14	51.97	0.85	
17	Portugal	91.74	51.17	0.84	
18	Armenia	86.22	48.00	0.83	●
19	Ukraine	83.83	46.63	0.82	●
20	Estonia	81.03	45.02	0.81	
21	Switzerland	76.35	42.33	0.80	
22	Viet Nam	76.29	42.30	0.79	●
23	Jamaica	76.23	42.26	0.78	●
24	Chile	73.62	40.76	0.77	
25	Argentina	70.39	38.90	0.76	●
26	Austria	69.82	38.58	0.75	
27	Slovakia	68.51	37.82	0.75	
28	Hong Kong (China)	67.07	37.00	0.74	
29	Uruguay	66.67	36.77	0.73	
30	Germany	66.27	36.54	0.72	
31	Australia	65.90	36.32	0.71	
32	Finland	64.28	35.39	0.70	
33	Romania	64.02	35.24	0.69	
34	Ecuador (2010)	63.94	35.20	0.68	●
35	Panama	63.03	34.67	0.67	
36	Cyprus	62.69	34.48	0.66	
37	Netherlands	59.56	32.68	0.65	○
38	Spain	56.99	31.20	0.64	
39	Honduras	55.48	30.33	0.63	●
40	Morocco	54.64	29.85	0.62	
41	Peru (2012)	54.30	29.66	0.61	
42	Croatia	53.06	28.95	0.60	
43	Latvia	52.98	28.90	0.59	
44	Sweden	52.85	28.83	0.58	○
45	Madagascar	51.52	28.06	0.57	
46	Lithuania	51.44	28.01	0.56	
47	Canada	51.42	28.01	0.55	○
48	Georgia	51.25	27.91	0.54	
49	Italy	50.25	27.33	0.53	
50	United Kingdom	50.18	27.29	0.52	○
51	Poland	50.08	27.23	0.51	
52	Albania	49.93	27.15	0.50	
53	Barbados	49.72	27.03	0.49	
54	Russian Federation	48.19	26.15	0.48	
55	Denmark	47.42	25.71	0.47	○
56	Seychelles	46.01	24.89	0.46	
57	Belgium	45.48	24.59	0.45	○
58	Serbia	43.72	23.58	0.44	
59	Dominican Republic	41.41	22.26	0.43	
60	Nicaragua	41.24	22.16	0.42	
61	Brazil	41.19	22.13	0.41	
62	Nepal	39.94	21.41	0.40	
63	Hungary	39.65	21.24	0.39	
64	Guatemala (2010)	39.25	21.01	0.38	
65	Mexico	37.40	19.95	0.37	
66	Mauritius	35.29	18.74	0.36	
67	Japan	33.79	17.88	0.35	○
68	Colombia	31.96	16.82	0.34	
69	Uzbekistan	31.09	16.32	0.33	
70	South Africa	30.51	15.99	0.32	
71	Norway	29.98	15.69	0.31	○
72	Thailand	28.91	15.07	0.30	
73	Jordan	27.76	14.41	0.29	
74	Sri Lanka	27.47	14.24	0.28	
75	India	27.00	13.98	0.27	
76	Philippines	26.03	13.42	0.26	
77	Azerbaijan	22.43	11.35	0.25	
78	Venezuela, Bolivarian Rep. (2011)	22.12	11.17	0.25	
79	Myanmar (2012)	21.93	11.06	0.24	
80	Malaysia	21.20	10.64	0.23	○
81	Cambodia	21.03	10.54	0.22	
82	United States of America	20.33	10.14	0.21	○
83	Nigeria	19.88	9.88	0.20	
84	Pakistan	18.81	9.27	0.19	
85	Gambia	18.40	9.03	0.18	
86	Yemen	18.33	8.99	0.17	
87	Indonesia	18.07	8.84	0.16	
88	Bosnia and Herzegovina	17.89	8.74	0.15	○
89	Kyrgyzstan	17.89	8.74	0.14	
90	Kazakhstan	17.81	8.69	0.13	○
91	Singapore	17.39	8.45	0.12	○
92	Bangladesh	16.14	7.73	0.11	
93	Israel	12.81	5.82	0.10	○
94	Tajikistan	11.98	5.34	0.09	
95	Uganda	10.03	4.22	0.08	
96	United Arab Emirates	9.28	3.79	0.07	○
97	Bahrain	7.36	2.69	0.06	○
98	Zambia	7.32	2.67	0.05	○
99	Algeria (2012)	6.94	2.45	0.04	
100	Rwanda (2012)	6.67	2.30	0.03	○
101	Sudan (2012)	5.90	1.85	0.02	○
102	Bhutan	2.95	0.16	0.01	○
103	Qatar	2.68	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Egypt	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Greece	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Ireland	n/a	n/a	n/a	
n/a	Kenya	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	TFYR of Macedonia	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Tunisia	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: World Intellectual Property Organization, *WIPO Statistics Database*; International Monetary Fund *World Economic Outlook Database*, 2015 (PPP$ GDP)

NOTE: ● indicates a strength; ○ a weakness

7.1.2 Madrid System trademark applications by country of origin

Number of international trademark applications issued through the Madrid system by country of origin (per billion PPP$ GDP) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Cyprus	7.55	100.00	0.94	●
1	Iceland	8.59	100.00	0.94	●
1	Luxembourg	6.81	100.00	0.94	●
1	Moldova, Rep.	4.23	100.00	0.94	●
1	Switzerland	6.65	100.00	0.94	●
6	Slovenia	3.12	73.77	0.93	●
7	Austria	2.53	59.67	0.91	●
8	Latvia	2.35	55.33	0.90	●
9	Estonia	2.30	54.31	0.88	
10	Denmark	2.22	52.47	0.87	
11	Bulgaria	2.18	51.35	0.85	●
12	New Zealand	2.14	50.48	0.84	
13	Croatia	1.81	42.63	0.82	●
14	Serbia	1.78	41.97	0.81	●
15	Netherlands	1.76	41.39	0.79	
16	Germany	1.75	41.21	0.78	
17	Finland	1.64	38.71	0.76	
18	Belgium	1.62	38.08	0.75	
19	Sweden	1.56	36.75	0.73	
20	Montenegro	1.50	35.24	0.72	
21	France	1.47	34.71	0.70	
22	Lithuania	1.47	34.62	0.69	
23	Australia	1.42	33.46	0.67	
24	Italy	1.29	30.34	0.66	
25	Hungary	1.18	27.80	0.64	
26	Ukraine	1.17	27.42	0.63	
27	United Kingdom	1.16	27.20	0.61	○
28	Belarus	1.12	26.41	0.60	
29	Armenia	1.11	26.16	0.58	
30	Israel	1.03	24.18	0.57	
31	Czech Republic	1.00	23.62	0.55	
32	Norway	0.95	22.27	0.54	○
33	Portugal	0.90	21.04	0.52	
34	Turkey	0.86	20.16	0.51	
35	Ireland	0.82	19.37	0.49	○
36	Spain	0.81	19.13	0.48	○
37	Slovakia	0.81	19.08	0.46	
38	TFYR of Macedonia	0.62	14.42	0.45	
39	Georgia	0.58	13.69	0.43	
40	Singapore	0.53	12.35	0.42	○
41	Bosnia and Herzegovina	0.53	12.29	0.40	
42	Japan	0.44	10.22	0.39	○
43	Poland	0.42	9.83	0.37	
44	Korea, Rep.	0.39	9.07	0.36	○
45	Greece	0.39	9.02	0.34	
46	United States of America	0.38	8.82	0.33	○
47	Russian Federation	0.36	8.33	0.31	
48	Morocco	0.32	7.36	0.30	
49	Azerbaijan	0.21	4.87	0.28	
50	Albania	0.19	4.36	0.27	
51	Romania	0.19	4.32	0.25	○
52	Kyrgyzstan	0.16	3.57	0.24	
53	Viet Nam	0.13	3.01	0.22	
54	China	0.13	2.85	0.21	
55	Kazakhstan	0.12	2.69	0.19	
56	Colombia	0.07	1.56	0.18	○
57	Philippines	0.07	1.47	0.16	
58	Mozambique	0.06	1.39	0.15	
59	Madagascar	0.06	1.26	0.13	
60	Sudan	0.05	1.05	0.12	
61	Tajikistan	0.04	0.92	0.10	
62	Mongolia	0.03	0.54	0.09	○
63	Egypt	0.02	0.44	0.07	○
64	Kenya	0.02	0.40	0.06	○
65	Iran, Islamic Rep.	0.02	0.34	0.04	○
66	Ghana	0.02	0.30	0.03	○
67	Uzbekistan	0.02	0.28	0.01	○
68	Algeria (2013)	0.01	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Argentina	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Brazil	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Canada	n/a	n/a	n/a	
n/a	Chile	n/a	n/a	n/a	
n/a	Costa Rica	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Hong Kong (China)	n/a	n/a	n/a	
n/a	India	n/a	n/a	n/a	
n/a	Indonesia	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Lebanon	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Malaysia	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Malta	n/a	n/a	n/a	
n/a	Mauritius	n/a	n/a	n/a	
n/a	Mexico	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Pakistan	n/a	n/a	n/a	
n/a	Panama	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Peru	n/a	n/a	n/a	
n/a	Qatar	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	South Africa	n/a	n/a	n/a	
n/a	Sri Lanka	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	Thailand	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Tunisia	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uruguay	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: World Intellectual Property Organization, *WIPO Statistics Database*; International Monetary Fund *World Economic Outlook Database*, 2015 (PPP$ GDP)

NOTE: ● indicates a strength; ○ a weakness

7.1.3 ICTs and business model creation

Average answer to the survey question: In your country, to what extent do ICTs enable new business models? [1 = not at all; 7 = to a great extent] | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Finland	5.85	80.80	1.00	●
2	United Arab Emirates	5.74	79.05	0.99	●
3	Estonia	5.72	78.58	0.98	●
4	Qatar	5.64	77.39	0.98	●
5	Netherlands	5.60	76.63	0.97	●
6	Sweden	5.57	76.09	0.96	●
7	Luxembourg	5.57	76.09	0.95	
8	United Kingdom	5.54	75.67	0.95	
9	Singapore	5.54	75.63	0.94	
10	Malaysia	5.50	75.04	0.93	●
11	Norway	5.50	74.93	0.92	
12	Korea, Rep.	5.47	74.58	0.92	
13	Switzerland	5.44	74.02	0.91	
14	Japan	5.39	73.14	0.90	
15	New Zealand	5.37	72.80	0.89	
16	Ireland	5.34	72.39	0.89	
17	Portugal	5.30	71.72	0.88	●
18	United States of America	5.27	71.12	0.87	
19	Germany	5.16	69.34	0.86	
20	Canada	5.14	68.93	0.86	
21	Israel	5.09	68.12	0.85	
22	Iceland	5.09	68.12	0.84	
23	Belgium	5.08	68.00	0.83	
24	Hong Kong (China)	5.04	67.28	0.83	
25	Spain	5.03	67.16	0.82	
26	Lithuania	5.01	66.88	0.81	
27	Rwanda	5.00	66.74	0.80	●
28	Chile	4.99	66.44	0.80	
29	Saudi Arabia	4.95	65.90	0.79	●
30	France	4.93	65.46	0.78	
31	Austria	4.93	65.42	0.77	
32	Indonesia	4.92	65.32	0.77	●
33	Panama	4.87	64.54	0.76	
34	Australia	4.86	64.32	0.75	
35	Malta	4.85	64.21	0.74	
36	Bahrain	4.85	64.18	0.73	
37	Kenya	4.84	63.93	0.73	●
38	Guatemala	4.80	63.36	0.72	●
39	Jordan	4.79	63.25	0.71	●
40	Azerbaijan	4.79	63.16	0.70	●
41	Costa Rica	4.73	62.21	0.70	
42	Turkey	4.72	62.08	0.69	
43	Denmark	4.70	61.73	0.68	
44	Thailand	4.67	61.20	0.67	
45	Czech Republic	4.65	60.87	0.67	
46	Uruguay	4.65	60.84	0.66	
47	China	4.64	60.60	0.65	
48	Philippines	4.63	60.47	0.64	
49	Colombia	4.61	60.18	0.64	
50	TFYR of Macedonia	4.61	60.09	0.63	
51	Senegal	4.60	59.94	0.62	●
52	Viet Nam	4.56	59.39	0.61	
53	Dominican Republic	4.55	59.23	0.61	●
54	Armenia	4.55	59.22	0.60	
55	Mali	4.55	59.10	0.59	●
56	South Africa	4.54	58.96	0.58	
57	Mauritius	4.53	58.86	0.58	
58	Oman	4.52	58.68	0.57	
59	Latvia	4.52	58.58	0.56	
60	Hungary	4.51	58.43	0.55	
61	Sri Lanka	4.50	58.35	0.55	
62	Croatia	4.47	57.90	0.54	
63	El Salvador	4.46	57.63	0.53	
64	Slovenia	4.44	57.26	0.52	
65	Mexico	4.41	56.91	0.52	
66	Cyprus	4.41	56.80	0.51	
67	Honduras	4.40	56.69	0.50	
68	Cabo Verde	4.38	56.41	0.49	
69	Nigeria	4.35	55.83	0.48	●
70	Zambia	4.34	55.71	0.48	
71	Burkina Faso	4.30	54.99	0.47	●
72	Kazakhstan	4.26	54.37	0.46	
73	Brazil	4.24	54.05	0.45	
74	Peru	4.24	53.98	0.45	
75	Montenegro	4.23	53.83	0.44	
76	Barbados	4.21	53.49	0.43	
77	Cambodia	4.19	53.15	0.42	
78	Cameroon	4.18	53.06	0.42	●
79	Gambia	4.16	52.70	0.41	
80	Slovakia	4.15	52.44	0.40	
81	Mongolia	4.13	52.22	0.39	
82	Paraguay	4.13	52.09	0.39	
83	Romania	4.11	51.76	0.38	
84	India	4.10	51.73	0.37	
85	Morocco	4.08	51.35	0.36	
86	Jamaica	4.07	51.24	0.36	
87	Tajikistan	4.07	51.23	0.35	
88	Namibia	4.07	51.17	0.34	
89	Bulgaria	4.06	50.99	0.33	
90	Russian Federation	4.02	50.39	0.33	
91	Pakistan	4.02	50.30	0.32	
92	Uganda	4.01	50.21	0.31	
93	Ghana	4.00	50.05	0.30	
94	Guyana	3.99	49.76	0.30	
95	Poland	3.96	49.38	0.29	○
96	Italy	3.95	49.23	0.28	○
97	Côte d'Ivoire	3.95	49.21	0.27	
98	Georgia	3.93	48.89	0.27	
99	Bolivia, Plurinational St.	3.86	47.67	0.26	
100	Seychelles	3.85	47.56	0.25	
101	Madagascar	3.84	47.32	0.24	
102	Zimbabwe	3.83	47.14	0.23	
103	Tunisia	3.82	46.96	0.23	
104	Egypt	3.77	46.12	0.22	
105	Iran, Islamic Rep.	3.76	46.02	0.21	
106	Serbia	3.76	45.97	0.20	○
107	Argentina	3.75	45.89	0.20	
108	Ukraine	3.75	45.86	0.19	○
109	Bangladesh	3.74	45.72	0.18	
110	Tanzania, United Rep.	3.74	45.68	0.17	
111	Bhutan	3.72	45.40	0.17	
112	Moldova, Rep.	3.71	45.17	0.16	○
113	Trinidad and Tobago	3.68	44.59	0.15	
114	Botswana	3.65	44.25	0.14	
115	Mozambique	3.65	44.12	0.14	
116	Kyrgyzstan	3.64	43.95	0.13	
117	Greece	3.61	43.54	0.12	○
118	Malawi	3.55	42.55	0.11	
119	Albania	3.41	40.15	0.11	○
120	Nepal	3.36	39.32	0.10	
121	Ethiopia	3.35	39.12	0.09	
122	Kuwait	3.34	38.96	0.08	○
123	Swaziland	3.33	38.91	0.08	○
124	Angola	3.33	38.83	0.07	
125	Lesotho	3.30	38.32	0.06	○
126	Venezuela, Bolivarian Rep.	3.29	38.16	0.05	
127	Lebanon	3.26	37.67	0.05	○
128	Nicaragua	3.22	37.03	0.04	○
129	Guinea	3.15	35.86	0.03	
130	Myanmar	3.07	34.48	0.02	
131	Algeria	3.07	34.46	0.02	○
132	Burundi	2.74	28.98	0.01	○
133	Yemen	2.71	28.53	0.00	○
n/a	Belarus	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	

SOURCE: World Economic Forum, *Executive Opinion Survey 2014–2015*

NOTE: ● indicates a strength; ○ a weakness

7.1.4 ICTs and organizational model creation

Average answer to the survey question: In your country, to what extent do ICTs enable new organizational models (e.g. virtual teams, remote working, telecommuting) within businesses? [1 = not at all; 7 = to a great extent] | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Finland	5.78	79.66	1.00	●
2	Estonia	5.71	78.43	0.99	●
3	Norway	5.50	75.08	0.98	●
4	Malaysia	5.49	74.87	0.98	●
5	United Arab Emirates	5.49	74.82	0.97	●
6	Netherlands	5.47	74.53	0.96	●
7	Qatar	5.47	74.43	0.95	●
8	United Kingdom	5.46	74.32	0.95	
9	United States of America	5.44	74.04	0.94	
10	Sweden	5.40	73.40	0.93	
11	Singapore	5.33	72.23	0.92	
12	Canada	5.25	70.80	0.92	
13	Ireland	5.22	70.41	0.91	
14	Iceland	5.17	69.56	0.90	
15	New Zealand	5.17	69.48	0.89	
16	Luxembourg	5.16	69.33	0.89	
17	Australia	5.16	69.27	0.88	
18	Portugal	5.12	68.63	0.87	
19	Korea, Rep.	5.06	67.72	0.86	
20	Hong Kong (China)	5.06	67.59	0.86	
21	Germany	4.99	66.55	0.85	
22	Lithuania	4.98	66.35	0.84	
23	Belgium	4.97	66.16	0.83	
24	Saudi Arabia	4.85	64.09	0.83	●
25	Switzerland	4.84	64.02	0.82	
26	Azerbaijan	4.75	62.51	0.81	●
27	Israel	4.75	62.44	0.80	
28	Guatemala	4.73	62.22	0.80	●
29	Jordan	4.72	62.01	0.79	●
30	Bahrain	4.69	61.55	0.78	
31	Denmark	4.69	61.54	0.77	
32	China	4.68	61.41	0.77	
33	Indonesia	4.68	61.31	0.76	●
34	Spain	4.66	60.95	0.75	
35	Latvia	4.65	60.79	0.74	
36	Costa Rica	4.65	60.78	0.73	
37	Japan	4.64	60.59	0.73	
38	Philippines	4.62	60.25	0.72	●
39	Malta	4.61	60.21	0.71	
40	Chile	4.59	59.88	0.70	
41	Panama	4.59	59.85	0.70	
42	Czech Republic	4.58	59.73	0.69	
43	Uruguay	4.58	59.68	0.68	
44	Armenia	4.56	59.27	0.67	
45	Rwanda	4.53	58.78	0.67	●
46	France	4.51	58.51	0.66	
47	Austria	4.51	58.48	0.65	
48	Dominican Republic	4.48	58.00	0.64	●
49	Sri Lanka	4.47	57.79	0.64	●
50	Croatia	4.47	57.77	0.63	
51	Honduras	4.46	57.68	0.62	●
52	Colombia	4.45	57.57	0.61	
53	Mauritius	4.41	56.86	0.61	
54	Slovenia	4.40	56.66	0.60	
55	Kenya	4.38	56.33	0.59	
56	Turkey	4.37	56.22	0.58	
57	South Africa	4.35	55.84	0.58	
58	Cambodia	4.31	55.18	0.57	●
59	El Salvador	4.30	55.00	0.56	
60	TFYR of Macedonia	4.30	54.95	0.55	
61	Mexico	4.28	54.73	0.55	
62	Senegal	4.20	53.29	0.54	●
63	Kazakhstan	4.17	52.85	0.53	
64	Cyprus	4.17	52.75	0.52	
65	Jamaica	4.17	52.75	0.52	
66	Thailand	4.16	52.69	0.51	
67	Mali	4.14	52.39	0.50	
68	Barbados	4.14	52.34	0.49	
69	Viet Nam	4.13	52.18	0.48	
70	Oman	4.13	52.13	0.48	
71	Peru	4.13	52.10	0.47	
72	Slovakia	4.09	51.45	0.46	
73	Hungary	4.06	51.02	0.45	
74	Brazil	4.05	50.82	0.45	
75	Guyana	4.04	50.68	0.44	
76	Russian Federation	4.02	50.33	0.43	
77	Cabo Verde	3.98	49.71	0.42	
78	Zambia	3.95	49.18	0.42	
79	Cameroon	3.95	49.15	0.41	
80	Gambia	3.94	49.02	0.40	
81	Tajikistan	3.93	48.91	0.39	
82	Montenegro	3.93	48.88	0.39	
83	Côte d'Ivoire	3.92	48.63	0.38	
84	Romania	3.91	48.46	0.37	
85	Nigeria	3.89	48.21	0.36	
86	India	3.89	48.10	0.36	
87	Paraguay	3.88	48.06	0.35	
88	Bulgaria	3.88	48.01	0.34	
89	Poland	3.86	47.71	0.33	
90	Namibia	3.86	47.61	0.33	
91	Trinidad and Tobago	3.84	47.37	0.32	
92	Bolivia, Plurinational St.	3.83	47.16	0.31	
93	Egypt	3.83	47.09	0.30	
94	Argentina	3.82	47.08	0.30	
95	Madagascar	3.82	46.97	0.29	
96	Uganda	3.78	46.25	0.28	
97	Morocco	3.67	44.55	0.27	
98	Ukraine	3.66	44.40	0.27	
99	Tanzania, United Rep.	3.65	44.17	0.26	
100	Mongolia	3.64	43.97	0.25	
101	Pakistan	3.60	43.27	0.24	
102	Tunisia	3.59	43.22	0.23	
103	Moldova, Rep.	3.59	43.14	0.23	○
104	Georgia	3.58	43.06	0.22	
105	Seychelles	3.58	42.93	0.21	○
106	Serbia	3.56	42.61	0.20	○
107	Bangladesh	3.55	42.54	0.20	
108	Iran, Islamic Rep.	3.55	42.49	0.19	
109	Ghana	3.53	42.19	0.18	
110	Burkina Faso	3.51	41.84	0.17	
111	Malawi	3.50	41.63	0.17	
112	Bhutan	3.49	41.44	0.16	
113	Zimbabwe	3.45	40.87	0.15	
114	Venezuela, Bolivarian Rep.	3.45	40.86	0.14	
115	Italy	3.43	40.49	0.14	○
116	Greece	3.42	40.40	0.13	○
117	Kyrgyzstan	3.38	39.63	0.12	
118	Kuwait	3.38	39.58	0.11	○
119	Mozambique	3.36	39.38	0.11	
120	Nepal	3.34	38.96	0.10	
121	Botswana	3.33	38.77	0.09	○
122	Nicaragua	3.30	38.32	0.08	
123	Swaziland	3.27	37.84	0.08	○
124	Ethiopia	3.16	36.06	0.07	
125	Algeria	3.11	35.24	0.06	
126	Albania	3.05	34.22	0.05	○
127	Lesotho	2.97	32.83	0.05	○
128	Yemen	2.92	32.07	0.04	
129	Myanmar	2.89	31.54	0.03	
130	Lebanon	2.86	31.08	0.02	○
131	Guinea	2.71	28.57	0.02	○
132	Angola	2.65	27.58	0.01	○
133	Burundi	2.43	23.90	0.00	○
n/a	Belarus	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	

SOURCE: World Economic Forum, *Executive Opinion Survey 2014–2015*

NOTE: ● indicates a strength; ○ a weakness

7.2.1 Cultural and creative services exports

Cultural and creative services exports (% of total trade) | 2012

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Luxembourg	5.66	100.00	0.99	●
1	Serbia	1.74	100.00	0.99	●
3	United Kingdom	1.55	89.31	0.98	●
4	Hungary	1.53	87.80	0.97	●
5	Belgium	1.38	79.42	0.95	●
6	Croatia	1.37	78.57	0.94	●
7	Montenegro (2013)	1.34	77.01	0.93	●
8	Lebanon	1.27	72.73	0.92	●
9	Latvia	1.23	70.90	0.91	●
10	United States of America	1.19	68.60	0.90	
11	Cameroon	1.16	66.71	0.88	●
12	France	1.06	60.66	0.87	
13	Slovenia	0.99	56.98	0.86	
14	Poland	0.98	56.06	0.85	●
15	Argentina (2013)	0.93	53.30	0.84	●
16	Israel	0.91	52.48	0.83	
17	New Zealand (2004)	0.86	49.28	0.81	
18	Albania (2013)	0.85	48.73	0.80	●
19	Russian Federation	0.84	48.32	0.79	
20	Estonia	0.84	48.11	0.78	
21	Spain	0.84	48.01	0.77	
22	Cyprus	0.82	47.22	0.76	
23	Moldova, Rep. (2013)	0.82	46.92	0.74	
24	Sweden	0.81	46.63	0.73	
25	Bulgaria	0.78	44.71	0.72	
26	Austria	0.73	41.87	0.71	
27	Romania	0.72	41.42	0.70	
28	Canada	0.72	41.33	0.69	
29	Denmark	0.71	40.92	0.67	
30	TFYR of Macedonia	0.66	37.76	0.66	
31	Czech Republic	0.63	36.39	0.65	
32	Morocco	0.58	33.35	0.64	
33	Portugal	0.56	32.25	0.63	
34	Norway	0.56	31.96	0.62	
35	Turkey	0.54	31.20	0.60	
36	Netherlands	0.51	29.45	0.59	○
37	Ecuador (2013)	0.43	24.84	0.58	
38	Slovakia	0.43	24.46	0.57	
39	Germany	0.39	22.56	0.56	
40	Colombia (2013)	0.36	20.51	0.55	
41	Korea, Rep. (2013)	0.33	18.97	0.53	
42	Italy	0.30	17.44	0.52	
43	Finland	0.29	16.60	0.51	○
44	Lithuania	0.29	16.44	0.50	
45	Brazil (2013)	0.28	16.26	0.49	
46	Iceland	0.26	15.10	0.48	
47	Armenia (2013)	0.26	14.94	0.47	
48	Bolivia, Plurinational St.	0.23	13.41	0.45	
49	China	0.23	13.12	0.44	
50	Malta	0.22	12.54	0.43	
51	Ireland	0.21	11.92	0.42	○
52	Algeria	0.20	11.52	0.41	
53	Guinea	0.19	10.95	0.40	●
54	Hong Kong (China)	0.18	10.17	0.38	○
55	Mozambique	0.13	7.39	0.37	
56	Peru	0.11	6.48	0.36	
57	Panama (2013)	0.11	6.28	0.35	
58	Georgia (2013)	0.10	5.57	0.34	
59	India	0.10	5.47	0.33	
60	Philippines (2013)	0.09	5.36	0.31	
61	Australia (2013)	0.08	4.61	0.30	○
62	Swaziland (2010)	0.07	4.21	0.29	
63	Greece	0.05	3.07	0.28	
64	Mongolia (2007)	0.05	2.67	0.27	
65	Ukraine (2013)	0.05	2.61	0.26	
66	Cabo Verde (2013)	0.04	2.28	0.24	
67	Malawi	0.04	2.26	0.23	
68	Fiji	0.04	2.10	0.22	
69	Azerbaijan (2013)	0.02	1.33	0.21	
70	Mexico (2013)	0.02	1.13	0.20	○
71	Japan	0.01	0.83	0.19	○
72	Belarus (2013)	0.01	0.81	0.17	○
73	Bosnia and Herzegovina (2013)	0.01	0.80	0.16	○
74	Mauritius (2013)	0.01	0.80	0.15	○
75	Costa Rica	0.01	0.64	0.14	○
76	Guatemala (2013)	0.01	0.62	0.13	
77	Pakistan	0.01	0.61	0.12	
78	Rwanda	0.01	0.60	0.10	
79	Venezuela, Bolivarian Rep.	0.01	0.52	0.09	
80	Mali	0.01	0.46	0.08	
81	Kazakhstan (2013)	0.01	0.40	0.07	○
82	Ethiopia	0.01	0.31	0.06	
83	Uganda	0.01	0.29	0.05	○
84	Senegal	0.00	0.17	0.03	○
85	Paraguay (2013)	0.00	0.17	0.02	○
86	Bangladesh	0.00	0.12	0.01	○
87	Kenya	0.00	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Bahrain	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Chile	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Egypt	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Indonesia	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Kyrgyzstan	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malaysia	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Oman	n/a	n/a	n/a	
n/a	Qatar	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Singapore	n/a	n/a	n/a	
n/a	South Africa	n/a	n/a	n/a	
n/a	Sri Lanka	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Switzerland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	Thailand	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Tunisia	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uruguay	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Viet Nam	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: World Trade Organization, *Trade in Commercial Services* database, based on the International Monetary Fund *Balance of Payments* database

NOTE: ● indicates a strength; ○ a weakness

7.2.2 National feature films produced

Number of national feature films produced (per million population 15–69 years old) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Azerbaijan	26.11	100.00	0.95	●
1	Bahrain	34.78	100.00	0.95	●
1	Bhutan (2011)	58.51	100.00	0.95	●
1	Iceland	30.10	100.00	0.95	●
1	Luxembourg (2011)	42.88	100.00	0.95	●
1	Mauritius (2011)	32.65	100.00	0.95	●
7	Guyana (2011)	22.86	87.53	0.94	●
8	Estonia	19.63	75.18	0.93	●
9	Switzerland	17.51	67.08	0.92	
10	Denmark	17.40	66.64	0.91	
11	Slovenia	15.15	58.00	0.90	
12	Armenia	13.09	50.13	0.89	●
13	Finland	12.73	48.76	0.88	
14	Nigeria (2011)	11.16	42.74	0.88	●
15	Israel	10.97	42.02	0.87	
16	Mongolia	10.51	40.25	0.86	●
17	Ireland	10.44	40.00	0.85	
18	Sweden	9.11	34.90	0.84	
19	Belgium	8.97	34.36	0.83	
20	Greece	8.75	33.52	0.82	
21	Croatia	8.41	32.21	0.81	●
22	TFYR of Macedonia	8.20	31.41	0.80	●
23	Norway	8.14	31.16	0.79	
24	New Zealand	7.89	30.20	0.78	
25	Austria	7.48	28.64	0.77	
26	Hong Kong (China)	7.43	28.45	0.76	
27	Spain	6.87	26.29	0.75	
28	Latvia	6.80	26.04	0.74	
29	Lithuania	6.76	25.87	0.73	
30	Japan	6.73	25.77	0.72	
31	Malta	6.24	23.91	0.71	
32	France	6.08	23.28	0.70	
33	Argentina	5.94	22.74	0.69	
34	Netherlands	5.66	21.69	0.68	
35	Czech Republic	5.65	21.63	0.67	
36	Korea, Rep.	5.47	20.93	0.66	
37	United Kingdom	5.43	20.80	0.65	○
38	Slovakia	5.29	20.25	0.64	
39	Uruguay	5.18	19.82	0.63	
40	Hungary	4.38	16.78	0.63	
41	Lebanon	4.24	16.23	0.62	
42	Bolivia, Plurinational St. (2009)	4.13	15.80	0.61	●
43	Bosnia and Herzegovina	3.92	15.01	0.60	
44	Italy	3.89	14.89	0.59	
45	Germany	3.80	14.56	0.58	
46	Canada	3.61	13.82	0.57	○
47	Malaysia	3.38	12.93	0.56	
48	United States of America	3.24	12.42	0.55	
49	Uzbekistan	3.13	12.00	0.54	●
50	Singapore	3.10	11.86	0.53	
51	Kazakhstan	3.05	11.67	0.52	
52	Georgia	2.90	11.10	0.51	
53	Bulgaria	2.83	10.85	0.50	
54	Serbia	2.56	9.80	0.49	
55	Chile	2.43	9.32	0.48	
56	Romania	2.30	8.81	0.47	
57	Cambodia	2.02	7.75	0.46	
58	Cameroon (2009)	1.83	7.00	0.45	●
59	Burkina Faso	1.78	6.82	0.44	
60	Tajikistan	1.77	6.78	0.43	
61	Fiji (2009)	1.72	6.60	0.42	
62	Portugal	1.71	6.55	0.41	○
63	Turkey	1.63	6.25	0.40	
64	Australia	1.56	5.99	0.39	○
65	India (2012)	1.55	5.92	0.38	
66	Mexico	1.53	5.86	0.38	
67	Iran, Islamic Rep.	1.49	5.72	0.37	
68	Viet Nam	1.34	5.13	0.36	
69	Guatemala (2010)	1.26	4.81	0.35	
70	Paraguay (2009)	1.25	4.81	0.34	
71	Cyprus	1.17	4.48	0.33	
72	Moldova, Rep.	1.14	4.35	0.32	
73	Venezuela, Bolivarian Rep.	1.02	3.91	0.31	
74	Sri Lanka	1.01	3.88	0.30	
75	Tunisia	1.01	3.87	0.29	
76	Thailand (2010)	0.99	3.78	0.28	
77	Morocco	0.97	3.71	0.27	
78	Dominican Republic (2009)	0.94	3.61	0.26	
79	Brazil	0.91	3.47	0.25	
80	Poland	0.91	3.47	0.24	○
81	Philippines	0.85	3.25	0.23	
82	Guinea (2010)	0.83	3.18	0.22	●
83	Colombia	0.79	3.01	0.21	
84	Niger (2011)	0.75	2.86	0.20	
85	Myanmar (2009)	0.74	2.85	0.19	
86	South Africa	0.71	2.70	0.18	○
87	Russian Federation	0.68	2.62	0.17	○
88	Egypt	0.61	2.35	0.16	
89	China	0.60	2.31	0.15	○
90	Peru	0.59	2.26	0.14	○
91	Belarus	0.57	2.19	0.13	○
92	Costa Rica	0.57	2.19	0.13	○
93	Kyrgyzstan	0.54	2.07	0.12	
94	Bangladesh	0.51	1.97	0.11	
95	Indonesia (2011)	0.51	1.96	0.10	
96	Honduras (2012)	0.41	1.57	0.09	○
97	Panama (2010)	0.41	1.57	0.08	○
98	Senegal	0.39	1.49	0.07	○
99	Ukraine	0.36	1.37	0.06	○
100	Nicaragua (2009)	0.28	1.08	0.05	○
101	El Salvador (2008)	0.26	1.00	0.04	○
102	Pakistan (2009)	0.26	0.99	0.03	○
103	Mali (2011)	0.14	0.52	0.02	○
104	Cabo Verde	0.00	0.00	0.00	○
104	Oman (2009)	0.00	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Algeria	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Jordan	n/a	n/a	n/a	
n/a	Kenya	n/a	n/a	n/a	
n/a	Kuwait	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Qatar	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Saudi Arabia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: UNESCO Institute for Statistics, *UIS online database*; United Nations, *World Population Prospects: The 2012 Revision* (population data)

NOTE: ● indicates a strength; ○ a weakness

7.2.3 Global entertainment and media output

Global entertainment and media output (per thousand population 15–69 years old) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Norway	3.38	100.00	1.00	●
2	Switzerland	2.67	78.97	0.98	●
3	Australia	2.31	68.21	0.97	●
4	United States of America	2.29	67.71	0.95	
5	Sweden	2.22	65.54	0.93	
6	Japan	2.22	65.46	0.91	
7	Denmark	2.09	61.53	0.90	
8	United Kingdom	2.00	58.92	0.88	
9	Austria	1.88	55.41	0.86	
10	Finland	1.85	54.48	0.84	
11	Germany	1.70	50.06	0.83	
12	Netherlands	1.70	49.90	0.81	
13	Canada	1.68	49.51	0.79	
14	France	1.61	47.23	0.78	
15	Belgium	1.57	46.16	0.76	
16	New Zealand	1.52	44.59	0.74	
17	Ireland	1.46	42.96	0.72	
18	Hong Kong (China)	1.42	41.61	0.71	
19	Korea, Rep.	1.26	36.84	0.69	
20	Singapore	1.26	36.72	0.67	
21	Qatar	1.07	31.14	0.66	
22	Italy	1.02	29.76	0.64	
23	Israel	0.96	27.77	0.62	
24	Portugal	0.91	26.30	0.60	
25	Spain	0.79	22.93	0.59	
26	Kuwait	0.69	19.85	0.57	
27	Czech Republic	0.59	16.97	0.55	
28	Greece	0.55	15.66	0.53	
29	Argentina	0.53	15.04	0.52	
30	United Arab Emirates	0.50	14.12	0.50	
31	Hungary	0.43	11.99	0.48	
32	Malaysia	0.38	10.66	0.47	
33	Saudi Arabia	0.37	10.22	0.45	
34	Poland	0.35	9.73	0.43	
35	South Africa	0.35	9.64	0.41	
36	Brazil	0.34	9.35	0.40	
37	Chile	0.31	8.65	0.38	○
38	Bahrain	0.31	8.54	0.36	
39	Mexico	0.29	8.02	0.34	
40	Oman	0.29	7.82	0.33	
41	Russian Federation	0.26	7.09	0.31	○
42	Turkey	0.22	5.94	0.29	
43	Venezuela, Bolivarian Rep.	0.22	5.92	0.28	
44	Colombia	0.22	5.70	0.26	
45	Thailand	0.19	5.00	0.24	
46	Romania	0.16	4.07	0.22	○
47	China	0.13	3.01	0.21	
48	Lebanon	0.12	2.93	0.19	
49	Philippines	0.09	2.11	0.17	
50	Indonesia	0.08	1.76	0.16	
51	Algeria	0.08	1.54	0.14	
52	Jordan	0.07	1.39	0.12	○
53	Kenya	0.07	1.32	0.10	○
54	Egypt	0.05	0.76	0.09	○
55	Morocco	0.04	0.61	0.07	○
56	Nigeria	0.04	0.35	0.05	
57	Viet Nam	0.03	0.24	0.03	○
58	India	0.03	0.20	0.02	○
59	Pakistan	0.02	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Armenia	n/a	n/a	n/a	
n/a	Azerbaijan	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Belarus	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Bulgaria	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Costa Rica	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Croatia	n/a	n/a	n/a	
n/a	Cyprus	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Estonia	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Georgia	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Iceland	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Kazakhstan	n/a	n/a	n/a	
n/a	Kyrgyzstan	n/a	n/a	n/a	
n/a	Latvia	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Lithuania	n/a	n/a	n/a	
n/a	Luxembourg	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Malta	n/a	n/a	n/a	
n/a	Mauritius	n/a	n/a	n/a	
n/a	Moldova, Rep.	n/a	n/a	n/a	
n/a	Mongolia	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Panama	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Peru	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Senegal	n/a	n/a	n/a	
n/a	Serbia	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Slovakia	n/a	n/a	n/a	
n/a	Slovenia	n/a	n/a	n/a	
n/a	Sri Lanka	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	TFYR of Macedonia	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Tunisia	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	
n/a	Ukraine	n/a	n/a	n/a	
n/a	Uruguay	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Yemen	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: PwC's *Global entertainment and media outlook, 2015–2019; United Nations,* World Population Prospects: *The 2012 Revision* (population data)

NOTE: ● indicates a strength; ○ a weakness

7.2.4 Printing and publishing output

Printing and publishing manufactures output (% of manufactures total output) | 2011

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Australia (2006)	6.11	100.00	0.96	●
1	Greece (2007)	7.12	100.00	0.96	●
1	Hong Kong (China) (2004)	18.25	100.00	0.96	●
1	Iceland (2006)	6.36	100.00	0.96	●
1	Malta (2009)	36.18	100.00	0.96	●
6	Panama (2005)	5.29	86.29	0.95	●
7	Lebanon (2007)	4.18	67.79	0.94	●
8	Georgia	3.52	56.61	0.93	●
9	Tanzania, United Rep. (2008)	3.41	54.87	0.92	●
10	Mauritius	3.22	51.58	0.91	●
11	Cyprus	3.12	49.99	0.90	●
12	Mongolia	2.94	46.96	0.89	●
13	Ethiopia (2009)	2.72	43.30	0.88	●
14	Costa Rica	2.69	42.68	0.87	●
15	Peru	2.66	42.23	0.86	●
16	TFYR of Macedonia	2.62	41.53	0.85	●
17	Colombia	2.58	40.93	0.84	●
18	Israel (2010)	2.55	40.36	0.82	
19	South Africa (2010)	2.44	38.50	0.81	●
20	Moldova, Rep.	2.38	37.49	0.80	●
21	Latvia	2.33	36.74	0.79	
22	Saudi Arabia (2009)	2.31	36.45	0.78	
23	Japan (2010)	2.27	35.71	0.77	
24	Fiji (2010)	2.25	35.33	0.76	●
25	United Kingdom	2.23	35.03	0.75	
26	Estonia	2.15	33.77	0.74	
27	Madagascar (2006)	2.08	32.51	0.73	●
28	New Zealand (2010)	1.98	30.90	0.72	
29	Slovenia	1.89	29.29	0.71	
30	United States of America (2008)	1.88	29.24	0.70	
31	Sri Lanka (2010)	1.82	28.14	0.69	●
32	Netherlands (2010)	1.81	28.05	0.68	
33	Norway (2010)	1.81	27.95	0.67	
34	Kenya	1.76	27.12	0.66	
35	Malawi (2010)	1.74	26.78	0.65	●
36	Kazakhstan (2007)	1.69	25.93	0.64	
37	Switzerland (2010)	1.67	25.64	0.63	
38	Serbia	1.67	25.61	0.62	
39	Nepal (2008)	1.65	25.39	0.61	●
40	Ireland (2010)	1.60	24.55	0.60	
41	Spain	1.58	24.18	0.59	
42	Luxembourg (2009)	1.57	23.97	0.58	
43	Armenia	1.55	23.71	0.57	
44	Ecuador (2008)	1.55	23.68	0.56	
45	Austria	1.52	23.09	0.55	○
46	Bangladesh (2006)	1.50	22.84	0.54	●
47	Senegal (2010)	1.50	22.79	0.53	
48	Ukraine	1.49	22.61	0.52	
49	Jordan	1.48	22.52	0.51	
50	Italy (2010)	1.48	22.46	0.49	
51	Portugal	1.46	22.14	0.48	
52	Paraguay (2010)	1.43	21.59	0.47	
53	Denmark	1.40	21.07	0.46	○
54	Belgium	1.37	20.58	0.45	○
55	Sweden	1.36	20.50	0.44	○
56	France	1.32	19.81	0.43	○
57	Czech Republic (2010)	1.31	19.64	0.42	
58	Cameroon (2008)	1.28	19.19	0.41	●
59	Viet Nam (2008)	1.25	18.67	0.40	
60	Finland	1.24	18.42	0.39	○
61	Germany	1.21	17.95	0.38	○
62	Algeria (2008)	1.21	17.88	0.36	
62	Russian Federation	1.21	17.88	0.36	
64	Bulgaria	1.21	17.86	0.35	
65	Uruguay (2009)	1.19	17.63	0.34	
66	Qatar (2010)	1.18	17.40	0.33	
67	Thailand (2006)	1.14	16.79	0.32	
68	Turkey (2009)	1.14	16.78	0.31	
69	Romania	1.13	16.52	0.30	
70	Trinidad and Tobago (2006)	1.12	16.36	0.29	
71	Poland	1.08	15.82	0.28	○
72	Bahrain (2010)	1.04	15.05	0.27	
73	Kyrgyzstan (2010)	1.02	14.78	0.26	
74	Lithuania	0.94	13.47	0.25	○
75	Indonesia	0.92	13.07	0.24	
76	Singapore	0.90	12.69	0.23	○
77	Brazil	0.88	12.47	0.22	○
78	Malaysia (2010)	0.87	12.22	0.21	○
79	Hungary	0.84	11.80	0.20	○
80	Morocco	0.84	11.68	0.19	○
81	Burundi (2010)	0.78	10.78	0.18	
82	Tunisia (2007)	0.72	9.67	0.16	○
83	Azerbaijan	0.71	9.59	0.15	
84	India (2010)	0.68	9.03	0.14	
85	Kuwait	0.65	8.53	0.13	
86	Egypt (2010)	0.64	8.46	0.12	○
87	Slovakia	0.64	8.38	0.11	○
88	Mexico	0.57	7.22	0.10	○
89	Tajikistan (2008)	0.56	7.04	0.09	
90	Korea, Rep. (2010)	0.53	6.47	0.08	○
91	China	0.52	6.37	0.07	○
92	Oman (2010)	0.42	4.63	0.06	○
93	Canada	0.40	4.37	0.05	○
94	Yemen (2009)	0.37	3.94	0.04	
95	Philippines (2008)	0.36	3.74	0.03	○
96	Pakistan (2006)	0.33	3.22	0.02	○
97	Iran, Islamic Rep. (2010)	0.21	1.19	0.01	○
98	Gambia (2004)	0.14	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Argentina	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Belarus	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Bosnia and Herzegovina	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Chile	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Croatia	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Ghana	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Montenegro	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Nigeria	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Uganda	n/a	n/a	n/a	
n/a	United Arab Emirates	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: United Nations Industrial Development Organization, *Industrial Statistics Database*, ISIC Revision 3 (INDSTAT4 2012)

NOTE: ● indicates a strength; ○ a weakness

7.2.5 Creative goods exports

Creative goods exports (% of total trade) | 2013

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	China	14.03	100.00	1.00	●
2	Slovakia	10.48	89.87	0.99	●
3	Malaysia	10.29	89.23	0.98	●
4	Czech Republic	10.06	88.48	0.98	●
5	Mexico	9.84	87.70	0.97	●
6	Thailand	9.26	85.63	0.96	●
7	Hungary	6.22	72.45	0.95	●
8	Netherlands	5.61	69.17	0.94	
9	Viet Nam	5.05	65.83	0.94	●
10	Singapore	5.05	65.83	0.93	
11	Switzerland	4.04	58.99	0.92	
12	Poland	3.89	57.92	0.91	●
13	Latvia	3.11	51.38	0.91	●
14	United Kingdom	2.83	48.82	0.90	
15	Korea, Rep.	2.58	46.28	0.89	
16	Tunisia	2.57	46.18	0.88	●
17	Turkey	2.56	46.04	0.87	●
18	India	2.52	45.62	0.87	●
19	Ireland	2.44	44.85	0.86	
20	Japan	2.37	44.00	0.85	
21	Italy	2.23	42.49	0.84	
22	Indonesia	1.91	38.61	0.83	●
23	Belgium	1.82	37.45	0.83	
24	Sweden	1.79	37.02	0.82	
25	Germany	1.76	36.67	0.81	
26	Guyana	1.69	35.76	0.80	●
27	France	1.69	35.75	0.80	
28	Israel	1.68	35.53	0.79	
29	United States of America	1.66	35.33	0.78	
30	Denmark	1.65	35.13	0.77	
31	Portugal	1.58	34.15	0.76	
32	Romania	1.49	32.87	0.76	●
33	Lithuania	1.46	32.48	0.75	
34	Austria	1.43	31.97	0.74	
35	Estonia	1.32	30.28	0.73	
36	Dominican Republic	1.24	28.97	0.72	●
37	Pakistan	1.15	27.45	0.72	●
38	Bolivia, Plurinational St.	1.06	25.99	0.71	●
39	Canada	0.99	24.68	0.70	
40	Malta	0.94	23.72	0.69	
41	Spain	0.84	21.80	0.69	
42	El Salvador	0.83	21.58	0.68	●
43	Bulgaria	0.82	21.34	0.67	
44	Mauritius	0.79	20.90	0.66	
45	Jordan	0.77	20.45	0.65	
46	Finland	0.73	19.63	0.65	
47	South Africa	0.72	19.41	0.64	
48	Serbia	0.72	19.38	0.63	
49	Slovenia	0.71	19.16	0.62	
50	Lebanon (2012)	0.69	18.79	0.61	
51	Australia	0.63	17.40	0.61	
52	Costa Rica	0.60	16.77	0.60	
53	Namibia	0.57	16.07	0.59	
54	Egypt	0.57	16.01	0.58	
55	Ukraine	0.57	16.01	0.57	
56	Greece	0.56	15.86	0.57	
57	Iran, Islamic Rep. (2011)	0.54	15.26	0.56	
58	Armenia	0.52	14.99	0.55	
59	Norway	0.52	14.91	0.54	
60	Croatia	0.47	13.77	0.54	
61	Cambodia	0.45	13.14	0.53	●
62	Russian Federation	0.43	12.72	0.52	
63	Guatemala	0.40	11.86	0.51	
64	Sri Lanka	0.39	11.77	0.50	
65	Belarus	0.39	11.72	0.50	
66	Kuwait	0.37	11.23	0.49	
67	Peru	0.33	9.98	0.48	
68	Zimbabwe (2012)	0.31	9.59	0.47	
69	New Zealand	0.30	9.40	0.46	○
70	Kazakhstan	0.29	8.96	0.46	
71	Kenya	0.28	8.66	0.45	
72	Colombia	0.27	8.33	0.44	
73	Nepal	0.26	8.04	0.43	●
74	Hong Kong (China)	0.23	7.38	0.43	○
75	Chile	0.23	7.35	0.42	
76	Brazil	0.23	7.17	0.41	
77	Botswana	0.19	6.11	0.40	
78	Nigeria	0.19	5.99	0.39	
79	Bosnia and Herzegovina	0.18	5.95	0.39	
80	TFYR of Macedonia	0.18	5.81	0.38	
81	Luxembourg	0.18	5.78	0.37	
82	Argentina	0.16	5.34	0.36	
83	Senegal (2012)	0.15	5.04	0.35	
84	Albania	0.15	4.91	0.35	
85	Montenegro	0.14	4.66	0.34	
86	Fiji	0.13	4.19	0.33	
87	Burundi (2010)	0.12	3.95	0.32	
88	Saudi Arabia	0.12	3.84	0.31	○
89	Nicaragua	0.11	3.61	0.31	
90	Madagascar (2012)	0.11	3.56	0.30	
91	Honduras (2012)	0.09	3.15	0.29	
92	Iceland	0.09	3.00	0.28	○
93	Malawi (2011)	0.08	2.78	0.28	
94	Uruguay	0.08	2.64	0.27	
95	Tanzania, United Rep.	0.07	2.48	0.26	
96	Ghana	0.07	2.42	0.25	
97	United Arab Emirates (2008)	0.06	2.10	0.24	○
98	Bangladesh (2011)	0.06	2.08	0.24	
99	Moldova, Rep.	0.06	2.02	0.23	○
100	Trinidad and Tobago (2010)	0.06	1.95	0.22	
101	Zambia (2012)	0.06	1.90	0.21	
102	Kyrgyzstan	0.06	1.90	0.20	
103	Sudan (2012)	0.05	1.81	0.20	
104	Ecuador	0.05	1.77	0.19	
105	Mongolia	0.05	1.72	0.18	
106	Ethiopia	0.05	1.70	0.17	
107	Jamaica	0.05	1.64	0.17	○
108	Georgia	0.04	1.41	0.16	○
109	Rwanda	0.03	1.10	0.15	
110	Uganda	0.03	1.06	0.14	
111	Myanmar (2010)	0.03	1.00	0.13	
112	Burkina Faso (2011)	0.03	0.86	0.13	
113	Paraguay	0.02	0.83	0.12	
114	Côte d'Ivoire (2012)	0.02	0.76	0.11	
115	Togo (2011)	0.02	0.70	0.10	
116	Gambia	0.02	0.60	0.09	
117	Mozambique	0.02	0.59	0.09	
118	Cyprus	0.02	0.55	0.08	○
119	Oman	0.02	0.53	0.07	○
120	Bhutan (2012)	0.01	0.33	0.06	
121	Qatar	0.01	0.29	0.06	○
122	Yemen	0.01	0.25	0.05	
123	Niger (2011)	0.01	0.19	0.04	
124	Panama	0.01	0.18	0.03	○
125	Azerbaijan	0.01	0.16	0.02	○
126	Bahrain (2011)	0.01	0.15	0.02	○
127	Mali (2012)	0.00	0.13	0.01	○
128	Algeria	0.00	0.00	0.00	○
n/a	Angola	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Morocco	n/a	n/a	n/a	
n/a	Philippines	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	

SOURCE: United Nations, *COMTRADE* database; 2009 UNESCO Framework for Cultural Statistics; World Trade Organization, *Trade in Commercial Services* database

NOTE: ● indicates a strength; ○ a weakness

7.3.1 Generic top-level domains (gTLDs)

Generic top-level domains gTLDs (per thousand population 15–69 years old) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Iceland	100.00	100.00	0.98	●
1	Luxembourg	100.00	100.00	0.98	●
1	Malta	46.14	46.14	0.97	●
1	Seychelles	100.00	100.00	0.98	●
5	United States of America	100.00	100.00	0.98	●
6	Canada	41.47	41.47	0.96	●
7	Netherlands	41.35	41.35	0.96	
8	Cyprus	36.75	36.75	0.95	●
9	Hong Kong (China)	36.51	36.51	0.94	
10	Australia	35.80	35.80	0.94	
11	Switzerland	34.78	34.78	0.93	
12	United Kingdom	33.65	33.65	0.92	
13	Ireland	33.07	33.07	0.91	
14	Germany	29.40	29.40	0.91	
15	Norway	28.90	28.90	0.90	
16	Panama	25.84	25.84	0.89	●
17	Denmark	25.40	25.40	0.89	
18	Sweden	23.20	23.20	0.88	
19	France	21.57	21.57	0.87	
20	Austria	20.06	20.06	0.86	
21	New Zealand	18.40	18.40	0.86	
22	Finland	15.85	15.85	0.85	
23	Spain	14.68	14.68	0.84	
24	Singapore	14.25	14.25	0.84	
25	Israel	12.90	12.90	0.83	
26	Belgium	11.91	11.91	0.82	
27	Italy	11.90	11.90	0.81	
28	Bulgaria	11.46	11.46	0.81	●
29	Slovenia	11.11	11.11	0.80	
30	Portugal	9.59	9.59	0.79	
31	Barbados	8.92	8.92	0.79	
32	Czech Republic	8.71	8.71	0.78	
33	Japan	8.53	8.53	0.77	
34	Croatia	7.33	7.33	0.76	●
35	Mauritius	6.86	6.86	0.76	
36	Turkey	6.80	6.80	0.75	
37	Lithuania	6.49	6.49	0.74	
38	Greece	6.35	6.35	0.74	
39	Costa Rica	5.91	5.91	0.73	
40	United Arab Emirates	5.83	5.83	0.72	
41	Hungary	5.44	5.44	0.71	
42	Kuwait	5.08	5.08	0.71	●
43	Estonia	5.00	5.00	0.70	
44	Namibia	4.76	4.76	0.69	●
45	Latvia	4.58	4.58	0.69	
46	Korea, Rep.	4.39	4.39	0.68	
47	Lebanon	4.16	4.16	0.67	
48	Poland	3.79	3.79	0.66	
49	Malaysia	3.49	3.49	0.66	
50	Jordan	3.49	3.49	0.65	
51	Uruguay	3.44	3.44	0.64	
52	TFYR of Macedonia	3.33	3.33	0.64	
53	Albania	3.12	3.12	0.63	
54	Bahrain	3.09	3.09	0.62	
55	Thailand	2.93	2.93	0.61	
56	Peru	2.61	2.61	0.61	
57	Guatemala	2.49	2.49	0.60	
58	Trinidad and Tobago	2.42	2.42	0.59	●
59	Romania	2.39	2.39	0.59	
60	Ukraine	2.33	2.33	0.58	
61	Qatar	2.25	2.25	0.57	
62	Saudi Arabia	1.78	1.78	0.56	
63	South Africa	1.77	1.77	0.56	
64	Russian Federation	1.74	1.74	0.55	
65	Argentina	1.66	1.66	0.54	
66	Slovakia	1.64	1.64	0.54	
67	Armenia	1.59	1.59	0.53	
68	Colombia	1.57	1.57	0.52	
69	Fiji	1.54	1.54	0.51	
70	Nicaragua	1.54	1.54	0.51	●
71	Mexico	1.43	1.43	0.50	
72	Tunisia	1.43	1.43	0.49	
73	Moldova, Rep.	1.33	1.33	0.49	
74	Viet Nam	1.32	1.32	0.48	
75	Bosnia and Herzegovina	1.31	1.31	0.47	
76	Dominican Republic	1.31	1.31	0.46	
77	El Salvador	1.30	1.30	0.46	
78	Cabo Verde	1.22	1.22	0.45	
79	Ecuador	1.17	1.17	0.44	
80	Oman	1.16	1.16	0.44	
81	Chile	1.15	1.15	0.43	
82	Bhutan	1.10	1.10	0.42	
83	Venezuela, Bolivarian Rep.	1.08	1.08	0.41	
84	China	1.05	1.05	0.41	
85	Jamaica	1.04	1.04	0.40	
86	Iran, Islamic Rep.	0.98	0.98	0.39	
87	Bolivia, Plurinational St.	0.96	0.96	0.39	
88	Belarus	0.94	0.94	0.38	
89	Paraguay	0.89	0.89	0.37	
90	Brazil	0.87	0.87	0.36	
91	Indonesia	0.86	0.86	0.36	
92	Morocco	0.85	0.85	0.35	
93	Georgia	0.84	0.84	0.34	
94	Montenegro	0.80	0.80	0.34	
95	Serbia	0.71	0.71	0.33	
96	Egypt	0.70	0.70	0.32	
97	Guyana	0.68	0.68	0.31	
98	Botswana	0.68	0.68	0.31	
99	Philippines	0.63	0.63	0.30	
100	Azerbaijan	0.62	0.62	0.29	
101	Niger	0.59	0.59	0.29	
102	Senegal	0.58	0.58	0.28	
103	Kenya	0.58	0.58	0.27	
104	India	0.53	0.53	0.26	
105	Cambodia	0.41	0.41	0.26	
106	Sri Lanka	0.41	0.41	0.25	
107	Togo	0.36	0.36	0.24	
108	Ghana	0.35	0.35	0.24	
109	Mongolia	0.34	0.34	0.23	
110	Honduras	0.34	0.34	0.22	
111	Pakistan	0.32	0.32	0.21	
112	Swaziland	0.30	0.30	0.21	
113	Nigeria	0.29	0.29	0.20	
114	Côte d'Ivoire	0.29	0.29	0.19	
115	Nepal	0.26	0.26	0.19	
116	Algeria	0.25	0.25	0.18	
117	Zimbabwe	0.22	0.22	0.17	
118	Yemen	0.21	0.21	0.16	
119	Kazakhstan	0.19	0.19	0.16	○
120	Bangladesh	0.19	0.19	0.15	
121	Uganda	0.13	0.13	0.14	
122	Kyrgyzstan	0.12	0.12	0.14	
123	Lesotho	0.11	0.11	0.13	
124	Malawi	0.11	0.11	0.12	
125	Cameroon	0.10	0.10	0.11	
126	Tanzania, United Rep.	0.09	0.09	0.11	
127	Mali	0.09	0.09	0.10	
128	Rwanda	0.08	0.08	0.09	○
129	Madagascar	0.07	0.07	0.09	
130	Zambia	0.07	0.07	0.08	
131	Gambia	0.07	0.07	0.07	○
132	Burkina Faso	0.04	0.04	0.06	○
133	Tajikistan	0.03	0.03	0.06	○
134	Guinea	0.03	0.03	0.05	
135	Sudan	0.03	0.03	0.04	
136	Burundi	0.02	0.02	0.04	
137	Mozambique	0.02	0.02	0.03	○
138	Myanmar	0.02	0.02	0.02	
139	Ethiopia	0.00	0.00	0.01	○
140	Angola	0.00	0.00	0.01	○
141	Uzbekistan	0.00	0.00	0.00	○

SOURCE: ZookNIC Inc; United Nations, Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2012 Revision* (population)

NOTE: ● indicates a strength; ○ a weakness

7.3.2 Country-code top-level domains (ccTLDs)

Country-code top-level domains ccTLDs (per thousand population 15–69 years old) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Denmark	100.00	100.00	0.97	●
1	Germany	100.00	100.00	0.97	●
1	Montenegro	100.00	100.00	0.97	●
1	Netherlands	100.00	100.00	0.97	●
1	Switzerland	100.00	100.00	0.97	●
6	United Kingdom	42.30	42.30	0.96	●
7	Iceland	38.99	38.99	0.96	●
8	Luxembourg	38.44	38.44	0.95	
9	Austria	36.19	36.19	0.94	●
10	Sweden	35.62	35.62	0.94	
11	Belgium	34.13	34.13	0.93	●
12	New Zealand	33.16	33.16	0.92	
13	Norway	32.37	32.37	0.91	
14	Australia	30.98	30.98	0.91	
15	Czech Republic	26.44	26.44	0.90	●
16	Finland	16.69	16.69	0.89	
17	Argentina	16.30	16.30	0.89	●
18	Portugal	16.17	16.17	0.88	●
19	Hungary	16.17	16.17	0.87	●
20	Canada	15.96	15.96	0.86	
21	Poland	15.73	15.73	0.86	●
22	Estonia	15.63	15.63	0.85	
23	Slovakia	13.76	13.76	0.84	●
24	Lithuania	13.65	13.65	0.84	
25	Latvia	13.57	13.57	0.83	
26	Slovenia	13.50	13.50	0.82	
27	Seychelles	11.53	11.53	0.81	●
28	Italy	11.47	11.47	0.81	
29	France	11.44	11.44	0.80	
30	Ireland	10.79	10.79	0.79	
31	Greece	9.48	9.48	0.79	
32	Spain	9.34	9.34	0.78	
33	Colombia	9.03	9.03	0.77	
34	Romania	8.33	8.33	0.76	●
35	Russian Federation	8.17	8.17	0.76	
36	Israel	8.09	8.09	0.75	
37	Singapore	7.08	7.08	0.74	
38	Chile	6.58	6.58	0.74	
39	Uruguay	5.45	5.45	0.73	
40	Croatia	5.02	5.02	0.72	
41	South Africa	4.97	4.97	0.71	
42	Hong Kong (China)	4.60	4.60	0.71	
43	Brazil	4.36	4.36	0.70	
44	Korea, Rep.	4.32	4.32	0.69	
45	Malta	3.45	3.45	0.69	
46	Ukraine	3.44	3.44	0.68	
47	Belarus	3.08	3.08	0.67	
48	Japan	2.85	2.85	0.66	
49	Cyprus	2.70	2.70	0.66	
50	United Arab Emirates	2.55	2.55	0.65	
51	Venezuela, Bolivarian Rep.	2.31	2.31	0.64	●
52	Malaysia	2.25	2.25	0.64	
53	Serbia	2.15	2.15	0.63	
54	China	1.89	1.89	0.62	
55	Kazakhstan	1.87	1.87	0.61	
56	Iran, Islamic Rep.	1.86	1.86	0.61	
57	Armenia	1.85	1.85	0.60	
58	Qatar	1.75	1.75	0.59	
59	Moldova, Rep.	1.69	1.69	0.59	
60	Mexico	1.54	1.54	0.58	
61	Viet Nam	1.49	1.49	0.57	
62	Mauritius	1.42	1.42	0.56	
63	United States of America	1.38	1.38	0.56	
64	Turkey	1.22	1.22	0.55	
65	Bulgaria	1.20	1.20	0.54	
66	Georgia	1.19	1.19	0.54	
67	Fiji	1.16	1.16	0.53	
68	Bosnia and Herzegovina	1.04	1.04	0.52	
69	Guyana	1.02	1.02	0.51	
70	Botswana	0.94	0.94	0.51	
71	Mongolia	0.88	0.88	0.50	
72	TFYR of Macedonia	0.81	0.81	0.49	
73	Costa Rica	0.81	0.81	0.49	
74	Bahrain	0.77	0.77	0.48	
75	Trinidad and Tobago	0.76	0.76	0.47	
76	Albania	0.74	0.74	0.46	
77	Barbados	0.71	0.71	0.46	
78	Peru	0.71	0.71	0.45	
79	Panama	0.67	0.67	0.44	
80	Ecuador	0.65	0.65	0.44	
81	Dominican Republic	0.63	0.63	0.43	
82	Paraguay	0.61	0.61	0.42	
83	Jamaica	0.60	0.60	0.41	
84	Azerbaijan	0.59	0.59	0.41	
85	Cabo Verde	0.44	0.44	0.40	
86	Nepal	0.41	0.41	0.39	
87	Bhutan	0.37	0.37	0.39	
88	Morocco	0.34	0.34	0.38	
89	Nicaragua	0.33	0.33	0.37	
90	Saudi Arabia	0.33	0.33	0.36	
91	El Salvador	0.32	0.32	0.36	
92	India	0.32	0.32	0.35	
93	Kenya	0.28	0.28	0.34	
94	Guatemala	0.28	0.28	0.34	
95	Bolivia, Plurinational St.	0.27	0.27	0.33	
96	Swaziland	0.27	0.27	0.32	
97	Kuwait	0.26	0.26	0.31	
98	Kyrgyzstan	0.26	0.26	0.31	
99	Gambia	0.25	0.25	0.30	
100	Honduras	0.25	0.25	0.29	
101	Tajikistan	0.24	0.24	0.29	
102	Thailand	0.22	0.22	0.28	
103	Philippines	0.20	0.20	0.27	
104	Cameroon	0.17	0.17	0.26	
105	Uzbekistan	0.17	0.17	0.26	
106	Lebanon	0.17	0.17	0.25	
107	Jordan	0.16	0.16	0.24	○
108	Indonesia	0.13	0.13	0.24	
109	Tunisia	0.12	0.12	0.23	
110	Sri Lanka	0.10	0.10	0.22	
111	Oman	0.09	0.09	0.21	
112	Senegal	0.08	0.08	0.21	
113	Lesotho	0.08	0.08	0.20	
114	Côte d'Ivoire	0.07	0.07	0.19	
115	Pakistan	0.07	0.07	0.19	
116	Nigeria	0.06	0.06	0.18	
117	Tanzania, United Rep.	0.06	0.06	0.17	
118	Burundi	0.06	0.06	0.16	
119	Mozambique	0.05	0.05	0.16	
120	Malawi	0.05	0.05	0.15	
121	Algeria	0.04	0.04	0.14	
122	Guinea	0.03	0.03	0.14	
123	Uganda	0.03	0.03	0.13	
124	Cambodia	0.03	0.03	0.12	
125	Zimbabwe	0.03	0.03	0.11	
126	Madagascar	0.03	0.03	0.11	
127	Namibia	0.03	0.03	0.10	○
128	Rwanda	0.02	0.02	0.09	○
129	Burkina Faso	0.02	0.02	0.09	
130	Egypt	0.02	0.02	0.08	○
131	Yemen	0.01	0.01	0.07	
132	Bangladesh	0.01	0.01	0.06	
133	Angola	0.01	0.01	0.06	
134	Ethiopia	0.00	0.00	0.05	
135	Myanmar	0.00	0.00	0.04	
136	Sudan	0.00	0.00	0.04	
137	Niger	0.00	0.00	0.03	○
138	Zambia	0.00	0.00	0.02	○
139	Ghana	0.00	0.00	0.01	○
140	Mali	0.00	0.00	0.01	○
141	Togo	0.00	0.00	0.00	○

SOURCE: ZookNIC Inc; United Nations, Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2012 Revision* (population)

NOTE: ● indicates a strength; ○ a weakness

7.3.3 Wikipedia monthly edits

Wikipedia monthly page edits (per million population 15–69 years old) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	Iceland	13,529.16	100.00	1.00	●
2	Hong Kong (China)	11,073.54	81.84	0.99	●
3	Ireland	9,744.51	72.01	0.99	●
4	United Kingdom	9,652.35	71.33	0.98	●
5	Malta	9,424.37	69.65	0.97	●
6	Netherlands	9,406.73	69.52	0.96	●
7	Finland	8,836.02	65.30	0.96	
8	Israel	7,906.33	58.42	0.95	
9	Australia	7,868.46	58.14	0.94	
10	New Zealand	7,816.31	57.76	0.94	
11	Estonia	7,671.34	56.69	0.93	●
12	Sweden	7,625.05	56.34	0.92	
13	Italy	7,569.56	55.93	0.91	●
14	Luxembourg	7,322.33	54.10	0.91	
15	Norway	7,232.92	53.44	0.90	
16	Canada	7,167.23	52.96	0.89	
17	Belgium	6,650.74	49.14	0.89	
18	Uruguay	6,005.16	44.36	0.88	●
19	Germany	5,952.06	43.97	0.87	
20	Spain	5,678.19	41.95	0.86	
21	Chile	5,520.35	40.78	0.86	●
22	Cyprus	5,408.77	39.95	0.85	
23	Denmark	5,288.93	39.07	0.84	
24	Montenegro	5,218.33	38.55	0.84	●
25	United States of America	5,148.43	38.03	0.83	
26	Austria	4,879.46	36.04	0.82	
27	France	4,814.47	35.56	0.81	
28	Bulgaria	4,772.61	35.25	0.81	●
29	Serbia	4,693.03	34.66	0.80	●
30	Armenia	4,651.34	34.35	0.79	●
31	Greece	4,568.81	33.74	0.79	
32	Switzerland	4,555.61	33.65	0.78	
33	Korea, Rep.	4,407.70	32.55	0.77	
34	Bosnia and Herzegovina	3,913.21	28.90	0.76	●
35	Argentina	3,777.59	27.89	0.76	●
36	Lithuania	3,619.07	26.72	0.75	
37	Croatia	3,562.67	26.30	0.74	
38	Slovakia	3,369.56	24.88	0.74	
39	Slovenia	3,298.34	24.35	0.73	
40	Japan	3,292.10	24.30	0.72	
41	Czech Republic	3,275.29	24.18	0.71	
42	Portugal	3,156.39	23.30	0.71	
43	TFYR of Macedonia	3,131.69	23.12	0.70	
44	Latvia	3,087.05	22.79	0.69	
45	Hungary	2,890.88	21.34	0.69	
46	Poland	2,614.24	19.29	0.68	
47	Albania	2,576.69	19.01	0.67	
48	Singapore	2,562.14	18.91	0.66	
49	Colombia	2,259.65	16.67	0.66	
50	Costa Rica	2,245.22	16.56	0.65	
51	Barbados	2,125.34	15.68	0.64	
52	Iran, Islamic Rep.	2,091.36	15.42	0.64	●
53	Qatar	2,058.25	15.18	0.63	
54	Peru	1,929.56	14.23	0.62	
55	United Arab Emirates	1,889.24	13.93	0.61	
56	Fiji	1,885.38	13.90	0.61	●
57	Belarus	1,864.61	13.75	0.60	
58	Ecuador	1,804.13	13.30	0.59	●
59	Azerbaijan	1,709.38	12.60	0.59	
60	Malaysia	1,677.11	12.36	0.58	
61	Venezuela, Bolivarian Rep.	1,623.93	11.97	0.57	
62	Georgia	1,586.93	11.69	0.56	
63	Russian Federation	1,568.96	11.56	0.56	
64	Bahrain	1,547.68	11.40	0.55	
65	Mexico	1,479.01	10.90	0.54	
66	Ukraine	1,472.06	10.85	0.54	
67	Saudi Arabia	1,469.75	10.83	0.53	
68	Kuwait	1,452.23	10.70	0.52	
69	Panama	1,416.52	10.43	0.51	
70	Trinidad and Tobago	1,399.14	10.31	0.51	
71	Philippines	1,298.29	9.56	0.50	
72	Dominican Republic	1,155.11	8.50	0.49	
73	Jordan	1,037.91	7.64	0.49	
74	Mauritius	998.83	7.35	0.48	
75	Mongolia	984.67	7.24	0.47	
76	Brazil	971.19	7.14	0.46	
77	Thailand	944.02	6.94	0.46	
78	Romania	934.51	6.87	0.45	
79	El Salvador	921.31	6.77	0.44	
80	Kazakhstan	919.66	6.76	0.44	
81	Lebanon	876.27	6.44	0.43	
82	Paraguay	872.44	6.41	0.42	
83	Moldova, Rep.	812.65	5.97	0.41	
84	Turkey	793.91	5.83	0.41	
85	Jamaica	779.80	5.73	0.40	
86	Honduras	777.82	5.71	0.39	
87	Guatemala	774.87	5.69	0.39	
88	Nicaragua	691.17	5.07	0.38	
89	Oman	637.37	4.67	0.37	
90	Bolivia, Plurinational St.	590.48	4.33	0.36	
91	Sri Lanka	536.61	3.93	0.36	
92	Tunisia	499.87	3.66	0.35	
93	Seychelles	473.18	3.46	0.34	
94	Egypt	439.07	3.21	0.34	
95	Algeria	399.68	2.92	0.33	
96	Morocco	390.44	2.85	0.32	
97	Guyana	373.44	2.72	0.31	
98	South Africa	363.80	2.65	0.31	
99	Kyrgyzstan	332.09	2.42	0.30	
100	Cabo Verde	299.78	2.18	0.29	
101	Viet Nam	267.66	1.94	0.29	
102	India	264.59	1.92	0.28	
103	Indonesia	260.62	1.89	0.27	
104	Pakistan	244.77	1.77	0.26	
105	Botswana	240.54	1.74	0.26	
106	Namibia	224.05	1.62	0.25	
107	Nepal	218.24	1.57	0.24	
108	Cambodia	202.64	1.46	0.24	
109	Bhutan	178.93	1.28	0.23	
110	China	149.78	1.07	0.22	
111	Bangladesh	121.58	0.86	0.21	
112	Yemen	117.46	0.83	0.21	
113	Kenya	107.00	0.75	0.20	
114	Ghana	101.69	0.71	0.19	
115	Tajikistan	97.53	0.68	0.19	
116	Zimbabwe	86.16	0.60	0.18	
117	Swaziland	64.00	0.43	0.17	
118	Angola	58.50	0.39	0.16	
119	Senegal	51.45	0.34	0.16	
120	Uzbekistan	49.99	0.33	0.15	
121	Gambia	49.66	0.33	0.14	
122	Sudan	48.87	0.32	0.14	
123	Uganda	46.51	0.30	0.13	
124	Zambia	44.34	0.29	0.12	
125	Tanzania, United Rep.	38.61	0.25	0.11	
126	Rwanda	38.57	0.25	0.11	
127	Lesotho	37.25	0.24	0.10	
128	Nigeria	36.19	0.23	0.09	
129	Mozambique	27.50	0.16	0.09	
130	Cameroon	27.50	0.16	0.08	○
131	Ethiopia	23.93	0.14	0.07	
132	Côte d'Ivoire	23.74	0.14	0.06	○
133	Myanmar	21.06	0.12	0.06	
134	Madagascar	16.14	0.08	0.05	○
135	Malawi	14.19	0.07	0.04	○
136	Togo	13.60	0.06	0.04	○
137	Mali	12.71	0.05	0.03	○
138	Burkina Faso	8.72	0.02	0.02	○
139	Burundi	7.62	0.02	0.01	○
140	Guinea	5.62	0.00	0.01	○
141	Niger	5.34	0.00	0.00	○

SOURCE: Wikimedia Foundation; United Nations, *World Population Prospects: The 2012 Revision* (population)

NOTE: ● indicates a strength; ○ a weakness

7.3.4 Video uploads on YouTube

Number of video uploads on YouTube (scaled by population 15–69 years old) | 2014

Rank	Country/Economy	Value	Score (0–100)	Percent rank	
1	United States of America	100.00	100.00	1.00	●
2	Israel	95.49	95.49	0.99	●
3	Netherlands	95.34	95.34	0.97	●
4	United Kingdom	94.74	94.74	0.96	
5	Hong Kong (China)	94.14	94.14	0.95	
6	Canada	93.53	93.53	0.93	
7	Estonia	93.38	93.38	0.92	●
8	Denmark	92.48	92.48	0.89	
8	Singapore	92.48	92.48	0.89	
10	Latvia	92.18	92.18	0.88	●
11	Finland	92.03	92.03	0.86	
12	Switzerland	91.73	91.73	0.85	
13	Sweden	91.43	91.43	0.84	
14	Ireland	89.77	89.77	0.82	
15	New Zealand	89.17	89.17	0.81	
16	Czech Republic	89.02	89.02	0.79	
17	Australia	88.57	88.57	0.78	
18	Norway	87.97	87.97	0.77	
19	Spain	87.82	87.82	0.75	
20	Hungary	87.07	87.07	0.74	
21	France	86.47	86.47	0.71	
21	Korea, Rep.	86.47	86.47	0.71	
23	Belgium	86.02	86.02	0.70	
24	Portugal	84.96	84.96	0.68	
25	Lithuania	84.81	84.81	0.67	
26	Greece	84.66	84.66	0.66	
27	Germany	83.61	83.61	0.64	
28	Japan	82.71	82.71	0.63	
29	Poland	82.41	82.41	0.62	
30	Austria	81.80	81.80	0.60	○
31	Argentina	81.20	81.20	0.58	
31	Slovenia	81.20	81.20	0.58	
33	Italy	80.90	80.90	0.56	
34	Chile	80.15	80.15	0.55	
35	Romania	79.10	79.10	0.53	
36	Slovakia	78.80	78.80	0.52	
37	Russian Federation	78.65	78.65	0.49	
37	Ukraine	78.65	78.65	0.49	
39	Saudi Arabia	78.50	78.50	0.48	
40	Kuwait	78.05	78.05	0.47	
41	Bulgaria	77.44	77.44	0.45	
42	Croatia	76.69	76.69	0.44	
43	Brazil	76.24	76.24	0.42	
44	Bahrain	75.94	75.94	0.40	
44	United Arab Emirates	75.94	75.94	0.40	
46	Serbia	74.89	74.89	0.38	
47	Morocco	74.14	74.14	0.37	
48	Mexico	73.68	73.68	0.33	
48	Peru	73.68	73.68	0.33	
48	TFYR of Macedonia	73.68	73.68	0.33	
51	Bosnia and Herzegovina	73.38	73.38	0.32	
52	Montenegro	73.08	73.08	0.30	○
53	Qatar	72.63	72.63	0.29	
54	Thailand	72.48	72.48	0.27	
55	Colombia	72.18	72.18	0.26	
56	Malaysia	69.62	69.62	0.25	○
57	Viet Nam	68.87	68.87	0.23	
58	Turkey	68.57	68.57	0.22	
59	Lebanon	67.07	67.07	0.21	
60	Philippines	62.86	62.86	0.19	
61	Egypt	62.56	62.56	0.16	
61	Jordan	62.56	62.56	0.16	○
63	Tunisia	58.95	58.95	0.15	○
64	Oman	56.69	56.69	0.14	○
65	Indonesia	55.49	55.49	0.12	
66	Algeria	48.72	48.72	0.11	
67	South Africa	45.86	45.86	0.10	○
68	India	37.29	37.29	0.08	○
69	Senegal	36.84	36.84	0.07	○
70	Yemen	36.54	36.54	0.05	
71	Kenya	29.17	29.17	0.04	○
72	Ghana	25.26	25.26	0.03	○
73	Uganda	13.38	13.38	0.01	○
74	Nigeria	0.00	0.00	0.00	○
n/a	Albania	n/a	n/a	n/a	
n/a	Angola	n/a	n/a	n/a	
n/a	Armenia	n/a	n/a	n/a	
n/a	Azerbaijan	n/a	n/a	n/a	
n/a	Bangladesh	n/a	n/a	n/a	
n/a	Barbados	n/a	n/a	n/a	
n/a	Belarus	n/a	n/a	n/a	
n/a	Bhutan	n/a	n/a	n/a	
n/a	Bolivia, Plurinational St.	n/a	n/a	n/a	
n/a	Botswana	n/a	n/a	n/a	
n/a	Burkina Faso	n/a	n/a	n/a	
n/a	Burundi	n/a	n/a	n/a	
n/a	Cabo Verde	n/a	n/a	n/a	
n/a	Cambodia	n/a	n/a	n/a	
n/a	Cameroon	n/a	n/a	n/a	
n/a	China	n/a	n/a	n/a	
n/a	Costa Rica	n/a	n/a	n/a	
n/a	Côte d'Ivoire	n/a	n/a	n/a	
n/a	Cyprus	n/a	n/a	n/a	
n/a	Dominican Republic	n/a	n/a	n/a	
n/a	Ecuador	n/a	n/a	n/a	
n/a	El Salvador	n/a	n/a	n/a	
n/a	Ethiopia	n/a	n/a	n/a	
n/a	Fiji	n/a	n/a	n/a	
n/a	Gambia	n/a	n/a	n/a	
n/a	Georgia	n/a	n/a	n/a	
n/a	Guatemala	n/a	n/a	n/a	
n/a	Guinea	n/a	n/a	n/a	
n/a	Guyana	n/a	n/a	n/a	
n/a	Honduras	n/a	n/a	n/a	
n/a	Iceland	n/a	n/a	n/a	
n/a	Iran, Islamic Rep.	n/a	n/a	n/a	
n/a	Jamaica	n/a	n/a	n/a	
n/a	Kazakhstan	n/a	n/a	n/a	
n/a	Kyrgyzstan	n/a	n/a	n/a	
n/a	Lesotho	n/a	n/a	n/a	
n/a	Luxembourg	n/a	n/a	n/a	
n/a	Madagascar	n/a	n/a	n/a	
n/a	Malawi	n/a	n/a	n/a	
n/a	Mali	n/a	n/a	n/a	
n/a	Malta	n/a	n/a	n/a	
n/a	Mauritius	n/a	n/a	n/a	
n/a	Moldova, Rep.	n/a	n/a	n/a	
n/a	Mongolia	n/a	n/a	n/a	
n/a	Mozambique	n/a	n/a	n/a	
n/a	Myanmar	n/a	n/a	n/a	
n/a	Namibia	n/a	n/a	n/a	
n/a	Nepal	n/a	n/a	n/a	
n/a	Nicaragua	n/a	n/a	n/a	
n/a	Niger	n/a	n/a	n/a	
n/a	Pakistan	n/a	n/a	n/a	
n/a	Panama	n/a	n/a	n/a	
n/a	Paraguay	n/a	n/a	n/a	
n/a	Rwanda	n/a	n/a	n/a	
n/a	Seychelles	n/a	n/a	n/a	
n/a	Sri Lanka	n/a	n/a	n/a	
n/a	Sudan	n/a	n/a	n/a	
n/a	Swaziland	n/a	n/a	n/a	
n/a	Tajikistan	n/a	n/a	n/a	
n/a	Tanzania, United Rep.	n/a	n/a	n/a	
n/a	Togo	n/a	n/a	n/a	
n/a	Trinidad and Tobago	n/a	n/a	n/a	
n/a	Uruguay	n/a	n/a	n/a	
n/a	Uzbekistan	n/a	n/a	n/a	
n/a	Venezuela, Bolivarian Rep.	n/a	n/a	n/a	
n/a	Zambia	n/a	n/a	n/a	
n/a	Zimbabwe	n/a	n/a	n/a	

SOURCE: Google, parent company of YouTube; United Nations, *World Population Prospects: The 2012 Revision* (population data)

NOTE: ● indicates a strength; ○ a weakness

Appendix III

Sources and Definitions

Sources and Definitions

This appendix complements the data tables by providing, for each of the 79 indicators included in the Global Innovation Index (GII), its title, its description, its definition, and its source. For each indicator for each country/economy, the most recent value within the period 2004–14 was used. The single year given next to the description corresponds to the most frequent year for which data were available; when more than one year is considered, the period is indicated at the end of the indicator's source in parentheses.

Some indicators received special treatment in the computation. A few variables required scaling by some other indicator to be comparable across countries, through division by gross domestic product (GDP) in current US dollars, purchasing power parity GDP in international dollars (PPP$ GDP), population, total exports, total trade, and so on. Details are provided in this appendix. The scaling factor was in each case the value corresponding to the same year of the particular indicator. In addition, 36 indicators that were assigned half weight are singled out with an 'a'. Finally, indicators for which higher scores indicate worse outcomes, commonly known as 'bads', are differentiated with a 'b' (details on the computation can be found in Appendix IV Technical Notes).

A total of 55 variables are hard data; 19 are composite indicators from international agencies, distinguished with an asterisk (*); and 5 are survey questions from the World Economic Forum's Executive Opinion Survey (EOS), singled out with a dagger (†).

1 Institutions

1.1 Political environment

1.1.1 Political stability and absence of violence/terrorism

Political stability and absence of violence/terrorism index* | 2013

Index that captures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism. Scores are standardized.

Source: World Bank, World Governance Indicators, 2013 update. (http://info.worldbank.org/governance/wgi/index.aspx#home)

1.1.2 Government effectiveness

Government effectiveness index* | 2013

Index that captures perceptions of the quality of public and civil services and the degree of their independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Scores are standardized.

Source: World Bank, World Governance Indicators, 2013 update. (http://info.worldbank.org/governance/wgi/index.aspx#home)

1.2 Regulatory environment

1.2.1 Regulatory quality

Regulatory quality index*[a] | 2013

Index that captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private-sector development. Scores are standardized.

Source: World Bank, World Governance Indicators, 2013 update. (http://info.worldbank.org/governance/wgi/index.aspx#home)

1.2.2 Rule of law

Rule of law index*[a] | 2013

Index that captures perceptions of the extent to which agents have confidence in and abide by the rules of society, in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Scores are standardized.

Source: World Bank, World Governance Indicators, 2013 update. (http://info.worldbank.org/governance/wgi/index.aspx#home)

1.2.3 Cost of redundancy dismissal

Sum of notice period and severance pay for redundancy dismissal (in salary weeks, averages for workers with 1, 5, and 10 years of tenure, with a minimum threshold of 8 weeks)[b] | 2014

Doing Business, in its indicators on employing workers, measures flexibility in the regulation of redundancy in a manner consistent with relevant ILO conventions to strike a better balance between labour market flexibility and social protection (including unemployment protection). The redundancy cost indicator is the sum of the cost of advance notice requirements added to severance payments due when terminating a redundant worker, expressed in weeks of salary. The average value of notice requirements and severance payments applicable to a worker with 1 year of tenure, a worker with 5 years of tenure, and a worker with 10 years of tenure is used to assign the score. If the redundancy cost adds up to 8 or fewer weeks of salary, a value of 8 is assigned but the actual number of weeks is published. If the cost adds up to more than 8 weeks of salary, the score is the number of weeks. One month is recorded as 4 and 1/3 weeks. Assumptions about the worker: the worker earns a salary plus benefits equal to the economy's average wage during the entire period of his employment; has a pay period that is the most common for workers in the economy; is a lawful citizen who belongs to the same race and religion as the majority of the economy's population; resides in the economy's largest business city; and is not a member of a labour union, unless membership is mandatory. Assumptions about the business: the business is a limited liability company; it operates in the economy's largest business city; it is 100% domestically owned; it operates in the manufacturing sector; it has 60 employees; it is subject to collective bargaining agreements in economies where such agreements cover more than half the manufacturing sector and apply even to firms not party to them; and it abides by every law and regulation but does not grant workers more benefits than mandated by law, regulation, or (if applicable) collective bargaining agreement.

Note: The methodology was improved for *Doing Business 2015,* which has affected the year-on-year comparability of these indicators. Read about the changes at http://www.doingbusiness.org/methodology/methodology-note

Source: World Bank, Doing Business 2015: Going Beyond Efficiency. (http://www.doingbusiness.org/reports/global-reports/doing-business-2015)

1.3 Business environment

1.3.1 Ease of starting a business

Ease of starting a business (distance to frontier)* | 2014

The ranking is the simple average of the percentile rankings on the component indicators of the ease of starting a business index: procedures (number); time (days); cost to complete each procedure (% of income per capita); and paid-in minimum capital (% of income per capita). *Doing Business* records all procedures that are officially required for an entrepreneur to start up and formally operate an industrial or commercial business. These include obtaining all necessary licenses and permits and completing any required notifications, verifications, or inscriptions for the company and employees with relevant authorities. To make the data comparable across economies, *Doing Business* uses a standardized business that is a limited liability company (or its legal equivalent); operates in the economy's largest business city; is 100% domestically owned and has 5 owners (none of whom is a legal entity); has start-up capital of 10 times income per capita, paid in cash; performs general industrial or commercial activities; it is not using heavily polluting production processes; leases the commercial plant or offices and is not a proprietor of real estate; does not qualify for investment incentives or any special benefits; has at least 10 and up to 50 employees 1 month after the commencement of operations, all of them domestic nationals; has a turnover of at least 100 times income per capita, and has a company deed 10 pages long. The distance to frontier measure benchmarks economies to the frontier in regulatory practice, measuring the absolute distance to the best performance on each indicator and showing how much the regulatory environment for local entrepreneurs in each economy has changed over time in absolute terms.

Note: The methodology was improved for *Doing Business 2015,* which has affected the year-on-year comparability of these indicators. Read about the changes at http://www.doingbusiness.org/methodology/methodology-note

Source: World Bank, Ease of Doing Business Index 2015, Doing Business 2015. (http://www.doingbusiness.org/reports/global-reports/doing-business-2015)

1.3.2 Ease of resolving insolvency

Ease of resolving insolvency (distance to frontier)* | 2014

The ranking on the ease of resolving insolvency is based on the recovery rate (cents on the dollar). To make the data comparable across economies, several assumptions about the business and the case are used: the recovery rate is recorded as cents on the dollar recouped by creditors through reorganization, liquidation, or debt enforcement (foreclosure) proceedings. The calculation takes into account the outcome: whether the business emerges from the proceedings as a going concern or the assets are sold piecemeal. Then the costs of the proceedings are deducted (1 cent for each percentage point of the value of the debtor's estate). Finally, the value lost as a result of the time the money remains tied up in insolvency proceedings is taken into account, including the loss of value due to depreciation of furniture, etc. The recovery rate is the present value of the remaining proceeds, based on end-2013 lending rates from the International Monetary Fund's *International Financial Statistics,* supplemented with data from central banks and the Economist Intelligence Unit. If an economy had zero cases a year over the past 5 years involving a judicial reorganization, judicial liquidation, or debt enforcement procedure (foreclosure), the economy receives a 'no practice' ranking. This means that creditors are unlikely to recover their money through a formal legal process (in or out of court). The recovery rate for 'no practice' economies is zero. Indicators resolving insolvency—time (in years) and cost (% of estate), while also computed by *Doing Business,* are not taken into account for the ranking on the ease of resolving insolvency. Refer to indicator 1.3.1 for details regarding the distance to frontier measure.

Note: The methodology was improved for *Doing Business 2015,* which has affected the year-on-year comparability of these indicators. Read about the changes at http://www.doingbusiness.org/methodology/methodology-note

Source: World Bank, Ease of Doing Business Index 2015, Doing Business 2015. (http://www.doingbusiness.org/reports/global-reports/doing-business-2015)

1.3.3 Ease of paying taxes

Ease of paying taxes (distance to frontier)* | 2014

The ranking is the simple average of the percentile rankings on the component indicators of the ease of paying taxes: payments (number per year); time (hours per year); profit tax (%); labour tax and contributions (%); other taxes (%); and total tax rate (% profit). Since 2012, a threshold calculated and adjusted on a yearly basis is applied to the total tax rate. The threshold is equivalent to the highest total tax rate among the top 15% of economies in the ranking on the total tax rate; this year the threshold is 26.1% (i.e., for all economies with a total tax rate below this threshold, the total tax rate is set at 26.1%). The threshold is not based on any underlying theory, but is intended to mitigate the effect of very low tax rates on the ranking of the ease of paying taxes. To make the data comparable across economies, several assumptions about the business and the taxes and contributions are used. The methodology benefited from discussion with members of the International Tax Dialogue and other stakeholders, which led to a refinement of the survey questions on the time to pay taxes, the collection of additional data on the labour tax wedge for further research, and the introduction of a threshold applied to the total tax rate for the purpose of calculating the ranking on the ease of paying taxes. Refer to indicator 1.3.1 for details regarding the distance to frontier measure.

Note: The methodology was improved for *Doing Business 2015,* which has affected the year-on-year comparability of these indicators. Read about the changes at http://www.doingbusiness.org/methodology/methodology-note

Source: World Bank, Ease of Doing Business Index 2015, Doing Business 2015. (http://www.doingbusiness.org/reports/global-reports/doing-business-2015)

2 Human capital and research

2.1 Education

2.1.1 Expenditure on education

Government expenditure on education (% of GDP) | 2011

Government operating expenditures in education, including wages and salaries and excluding capital investments in buildings and equipment, as a percentage of gross domestic product (GDP).

Source: UNESCO Institute for Statistics, UIS online database (2005–13). (http://stats.uis.unesco.org)

2.1.2 Government expenditure on education per pupil, secondary

Government expenditure per pupil, secondary (% of GDP per capita) | 2011

Government spending on education divided by the total number of secondary students, as a percentage of GDP per capita. Government expenditure (current and capital) includes government spending on educational institutions (both public and private), education administration, and subsidies for private entities (students/households and other private entities).

Source: UNESCO Institute for Statistics, UIS online database (2005–13). (http://stats.uis.unesco.org)

2.1.3 School life expectancy

School life expectancy, primary to tertiary education (years) | 2012

Total number of years of schooling that a child of a certain age can expect to receive in the future, assuming that the probability of his or her being enrolled in school at any particular age is equal to the current enrolment ratio for that age.

Source: UNESCO Institute for Statistics, UIS online database (2004–13). (http://stats.uis.unesco.org)

2.1.4 Assessment in reading, mathematics, and science

PISA average scales in reading, mathematics, and science[a] | 2012

The Organisation for Economic Co-operation and Development (OECD) Programme for International Student Assessment (PISA) develops three-yearly surveys that examine 15-year-old students' performance in reading, mathematics, and science. The scores are calculated in each year so that the mean is 500 and the standard deviation 100. The scores for China come from Shanghai; those for India from Himachal Pradesh and Tamil Nadu (average); those for the United Arab Emirates from Dubai; and those for the Bolivarian Republic of Venezuela from Miranda. These scores are those from the GII 2014 report.

Source: OECD Programme for International Student Assessment (PISA) (2010–12). (www.pisa.oecd.org/)

2.1.5 Pupil-teacher ratio, secondary

Pupil-teacher ratio, secondary[a,b] | 2012

The number of pupils enrolled in secondary school divided by the number of secondary school teachers (regardless of their teaching assignment). Where the

data are missing for some countries, the ratios for upper-secondary are reported; if these are also missing, the ratios for lower-secondary are reported instead.

Source: UNESCO Institute for Statistics, UIS online database (2005–13). (http://stats.uis.unesco.org)

2.2 Tertiary education

2.2.1 Tertiary enrolment

School enrolment, tertiary (% gross)[a] | 2012

The ratio of total tertiary enrolment, regardless of age, to the population of the age group that officially corresponds to the tertiary level of education. Tertiary education, whether or not to an advanced research qualification, normally requires, as a minimum condition of admission, the successful completion of education at the secondary level.

Source: UNESCO Institute for Statistics, UIS online database (2005–13). (http://stats.uis.unesco.org)

2.2.2 Graduates in science and engineering

Tertiary graduates in engineering, manufacturing, and construction (% of total tertiary graduates) |2012

The share of all tertiary graduates in manufacturing, engineering, and construction over all tertiary graduates.

Source: UNESCO Institute for Statistics, UIS online database (2005–13). (http://stats.uis.unesco.org)

2.2.3 Tertiary inbound mobility

Tertiary inbound mobility ratio (%)[a] | 2012

The number of students from abroad studying in a given country, as a percentage of the total tertiary enrolment in that country.

Source: UNESCO Institute for Statistics, UIS online database (2005–13). (http://stats.uis.unesco.org)

2.3 Research and development (R&D)

2.3.1 Researchers

Researchers, full-time equivalence (FTE) (per million population) | 2013

Researchers per million population, full-time equivalence. Researchers in R&D are professionals engaged in the conception or creation of new knowledge, products, processes, methods, or systems and in the management of the projects concerned. Postgraduate PhD students (ISCED97 level 6) engaged in R&D are included.

Source: UNESCO Institute for Statistics, UIS online database (2005–13). (http://stats.uis.unesco.org)

2.3.2 Gross expenditure on R&D (GERD)

GERD: Gross expenditure on R&D (% of GDP) | 2013

Total domestic intramural expenditure on R&D during a given period as a percentage of GDP. Intramural R&D expenditure is all expenditure for R&D performed within a statistical unit or sector of the economy during a specific period, whatever the source of funds.

Source: UNESCO Institute for Statistics, UIS online database (2005–13). (http://stats.uis.unesco.org)

2.3.3 QS university ranking average score of top 3 universities

Average score of the top 3 universities at the QS world university ranking* | 2014

Average score of the top three universities per country. If fewer than three universities are listed in the QS ranking of the global top 700 universities, the sum of the scores of the listed universities is divided by three, thus implying a score of zero for the non-listed universities.

Source: QS Quacquarelli Symonds Ltd, QS World University Ranking 2014/2015, Top Universities. (http://www.topuniversities.com/university-rankings/world-university-rankings/2014)

3 Infrastructure

3.1 Information and communication technologies (ICTs)

3.1.1 ICT access

ICT access index* | 2013

The ICT access index is a composite index that weights five ICT indicators (20% each): (1) Fixed telephone lines per 100 inhabitants; (2) Mobile cellular telephone subscriptions per 100 inhabitants; (3) International Internet bandwidth (bit/s) per Internet user; (4) Percentage of households with a computer; and (5) Percentage of households with Internet access. It is the first sub-index in ITU's ICT Development Index (IDI).

Source: International Telecommunication Union, Measuring the Information Society 2014, ICT Development Index 2014. (http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2014.aspx)

3.1.2 ICT use

ICT use index* | 2013

The ICT use index is a composite index that weights three ICT indicators (33% each): (1) Percentage of individuals using the Internet; (2) Fixed (wired)-broadband Internet subscriptions per 100 inhabitants; (3) Active mobile-broadband subscriptions per 100 inhabitants. It is the second sub-index in ITU's ICT Development Index (IDI).

Source: International Telecommunication Union, Measuring the Information Society 2014, ICT Development Index 2014. (http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2014.aspx)

3.1.3 Government's online service

Government's online service index* | 2014

To arrive at a set of Online Service Index values, research teams assessed each country's national website, including the national central portal, e-services portal, and e-participation portal as well as the websites of the related ministries of education, labour, social services, health, finance, and environment, as applicable. In addition to being assessed for content and features, the national sites were tested for a minimal level of web content accessibility as described in the *Web Content Accessibility Guidelines* of the World Wide Web Consortium. The survey covers four stages of government's online service development, with points assigned for (1) an emerging presence, providing limited and basic information; (2) an enhanced presence, providing greater public policy and governance sources of information, such as policies, laws and regulation, downloadable databases, etc.; (3) a transactional presence, allowing two-way interactions between government and citizens (G2C and C2G), including paying taxes and applying for ID cards, birth certificates, passports, license renewals, etc.; and (4) a connected presence, characterized by G2G, G2C, and C2G interactions; participatory deliberative policy- and decision-making. A citizen-centric approach was followed. It is the first of three components of the E-Government Development Index (EGDI) of the United Nations Public Administration Network (UNPAN), together with components on telecommunication infrastructure and human capital.

Note: The precise meaning of these values varies from one edition of the Survey to the next as understanding of the potential of e-government changes and the underlying technology evolves. Read about the methodology

at http://unpan3.un.org/egovkb/en-us/About/Methodology

Source: United Nations Public Administration Network, e-Government Survey 2014. (http://unpan3.un.org/egovkb/Reports/UN-E-Government-Survey-2014)

3.1.4 Online e-participation

E-Participation Index* | 2014

The United Nations E-Participation Index is based on the survey used for the UN Online Service Index. The survey was expanded with questions emphasizing quality in the connected presence stage of e-government. These questions focus on the use of the Internet to facilitate the provision of information by governments to citizens ('e-information sharing'), interaction with stakeholders ('e-consultation'), and engagement in decision-making processes ('e-decision making'). A country's E-Participation Index value reflects how useful these features are and the extent to which they have been deployed by the government compared with all other countries. The purpose of this measure is to offer insight into how different countries are using online tools to promote interaction between citizens and government, as well as among citizens, for the benefit of all. The index ranges from 0 to 1, with 1 showing greater e-participation.

Note: The precise meaning of these values varies from one edition of the Survey to the next as understanding of the potential of e-government changes and the underlying technology evolves. Read about the methodology at http://unpan3.un.org/egovkb/en-us/About/Methodology

Source: United Nations Public Administration Network, e-Government Survey 2014. (http://unpan3.un.org/egovkb/Reports/UN-E-Government-Survey-2014)

3.2 General infrastructure

3.2.1 Electricity output

Electricity output (kWh per capita)[a] | 2012

Electricity production, measured at the terminals of all alternator sets in a station. In addition to hydropower, coal, oil, gas, and nuclear power generation, this indicator covers generation by geothermal, solar, wind, and tide and wave energy, as well as that from combustible renewables and waste. Production includes the output of electricity plants that are designed to produce electricity only as well as that of combined heat and power plants. Electricity output in KWh is scaled by population.

Source: International Energy Agency, World Energy Balances online data service (2012–13). (http://www.iea.org/stats/)

3.2.2 Logistics performance

Logistics Performance Index*[a] | 2014

A multidimensional assessment of logistics performance, the Logistics Performance Index (LPI) compares the trade logistics profiles of 160 countries and rates them on a scale of 1 (worst) to 5 (best). The ratings are based on 6,000 individual country assessments by nearly 1,000 international freight forwarders, who rated the eight foreign countries their company serves most frequently. The LPI's six components include: (1) the efficiency of the clearance process (speed, simplicity, and predictability of formalities) by border control agencies, including customs; (2) the quality of trade- and transport-related infrastructure (ports, railroads, roads, information technology); (3) the ease of arranging competitively priced shipments; (4) the competence and quality of logistics services (transport operators, customs brokers); (5) the ability to track and trace consignments; and (6) the frequency with which shipments reach the consignee within the scheduled or expected delivery time. Details of the survey methodology are in Arvis et al.'s *Connecting to Compete 2014: Trade Logistics in the Global Economy* (2014). Scores are averaged across all respondents.

Source: World Bank and Turku School of Economics, Logistics Performance Index 2014; Arvis et al., 2014, Connecting to Compete 2014: Trade Logistics in the Global Economy. (http://lpi.worldbank.org/)

3.2.3 Gross capital formation

Gross capital formation (% of GDP) | 2014

Ratio of total gross capital formation in current local currency to GDP in current local currency. Gross capital formation or investment is measured by the total value of the gross fixed capital formation and changes in inventories and acquisitions less disposals of valuables for a unit or sector, on the basis of the System of National Accounts (SNA) of 1993. Gross fixed capital formation consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales and 'work in progress'. Net acquisitions of valuables are also considered capital formation.

Source: International Monetary Fund, World Economic Outlook 2014 database, April 2015 (PPP$ GDP). (http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/weoselgr.aspx)

3.3 Ecological sustainability

3.3.1 GDP per unit of energy use

GDP per unit of energy use (2005 PPP$ per kg of oil equivalent) | 2012

Purchasing power parity gross domestic product (PPP$ GDP) per kilogram of oil equivalent of energy use. Energy use or total primary energy supply (TPES) is calculated as the production of fuels + inputs from other sources + imports – exports – international marine bunkers +/– stock changes. It includes coal, crude oil, natural gas liquids, refinery feedstocks, additives, petroleum products, gases, combustible renewables and waste, electricity, and heat. Domestic supply (also called 'energy apparent consumption') differs from final consumption in that it does not take account of distribution losses. The supply (or use) of energy commodities is converted to kilograms or tons of oil equivalent (koe, toe) using standard coefficients for each energy source.

Source: International Energy Agency, World Energy Balances online data service (2012–13). (http://www.iea.org/stats/)

3.3.2 Environmental performance

Environmental Performance Index* | 2014

This index ranks countries on 20 performance indicators tracked across policy categories that cover both environmental public health and ecosystem vitality. These indicators gauge how close countries are to established environmental policy goals. The index ranges from 0 to 100, with 100 indicating best performance.

Source: Yale University and Columbia University, Environmental Performance Index 2014. (http://epi.yale.edu/)

3.3.3 ISO 14001 environmental certificates

ISO 14001 Environmental management systems—Requirements with guidance for use: Number of certificates issued (per billion PPP$ GDP)[a] | 2013

Number of certificates of conformity to 'ISO 14001:2004 Environmental management systems: Requirements with guidance for use' issued, according to the

ISO survey. Single-site and multiple-site certificates are not distinguished. The ISO survey is published on an annual basis by the International Organization for Standardization (ISO). Only certification bodies accredited by national members of the International Accreditation Forum (http://www.iaf.nu) were used as sources (except for certificates in the Russian Federation, which were accredited locally). Certification of conformity with standards is not a requirement and the standards can be implemented without certification, but certification is perceived as adding value and trust. ISO is a network of the national standards institutes of 162 countries, and it is the world's largest developer of voluntary International Standards for business, government, and society, with a portfolio of more than 19,500 standards in almost every sector of economic activity and technology. ISO itself does not perform certification to its standards, does not issue certificates, and does not control certification performed independently of ISO by other organizations. The data are reported per billion PPP$ GDP.

Source: International Organization for Standardization (ISO), The ISO Survey of Management System Standard Certifications, 1999–2013; International Monetary Fund, World Economic Outlook 2014 database, April 2015 (PPP$ GDP). (http://www.iso.org; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/weoselgr.aspx)

4 Market sophistication

4.1 Credit

4.1.1 Ease of getting credit

Ease of getting credit (distance to frontier)* | 2014

The ranking is the simple average of the percentile rankings on the component indicators of the ease of getting credit index: strength of legal rights index (range 0–10); and depth of credit information index (range 0–6). *Doing Business* measures the legal rights of borrowers and lenders with respect to secured transactions through one set of indicators and the sharing of credit information through another. The first set of indicators describes how well collateral and bankruptcy laws facilitate lending. The second set measures the coverage, scope, and accessibility of credit information available through public credit registries and private credit bureaus. Although *Doing Business* compiles data on getting credit for public registry coverage (% of adults) and for private bureau coverage (% of adults), these indicators are not included in the ranking. Refer to indicator 1.3.1 for details regarding the distance to frontier measure.

Note: The methodology was improved for *Doing Business 2015,* which has affected the year-on-year comparability of these indicators. Read about the changes at http://www.doingbusiness.org/methodology/methodology-note

Source: World Bank, Ease of Doing Business Index 2015, Doing Business 2015. (http://www.doingbusiness.org/reports/global-reports/doing-business-2015)

4.1.2 Domestic credit to private sector

Domestic credit to private sector (% of GDP) | 2013

Financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries, these claims include credit to public enterprises.

Source: International Monetary Fund, International Financial Statistics and data files; and World Bank and OECD GDP estimates; extracted from the World Bank's World Development Indicators database (2004–13). (http://data.worldbank.org/)

4.1.3 Microfinance institutions' gross loan portfolio

Microfinance institutions: Gross loan portfolio (% of GDP) | 2013

Combined gross loan balances per microfinance institution (current US$), divided by GDP (current US$) and multiplied by 100.

Source: Microfinance Information Exchange, Mix Market database; International Monetary Fund, World Economic Outlook 2014 database, April 2015 (PPP$ GDP). (http://www.mixmarket.org/crossmarket-analysis-report/download; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/download.aspx)

4.2 Investment

4.2.1 Ease of protecting investors

Ease of protecting investors (distance to frontier)* | 2014

The ranking is the simple average of the percentile rankings on the component indicators of the ease of protecting investors index: the extent of disclosure index (0–10); the extent of director liability index (0–10); the ease of shareholder suits index (0–10); and the strength of investor protection index (0–10). *Doing Business* measures the strength of minority shareholder protections against directors' misuse of corporate assets for personal gain. The indicators distinguish three dimensions of investor protections: transparency of related-party transactions (extent of disclosure index), liability for self-dealing (extent of director liability index), and shareholders' ability to sue officers and directors for misconduct (ease of shareholder suits index). The data come from a survey of corporate and securities lawyers and are based on securities regulations, company laws, civil procedure codes, and court rules of evidence. Refer to indicator 1.3.1 for details regarding the distance to frontier measure.

Note: The methodology was improved for *Doing Business 2015,* which has affected the year-on-year comparability of these indicators. Read about the changes at http://www.doingbusiness.org/methodology/methodology-note

Source: World Bank, Ease of Doing Business Index 2015, Doing Business 2015. (http://www.doingbusiness.org/reports/global-reports/doing-business-2015)

4.2.2 Market capitalization

Market capitalization of listed companies (% of GDP) [a] | 2012

Market capitalization (also known as 'market value') is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. Listed companies do not include investment companies, mutual funds, or other collective investment vehicles.

Source: Standard and Poor's and World Bank and OECD GDP estimates; extracted from the World Bank's World Development Indicators database (2006–12). (http://data.worldbank.org/)

4.2.3 Total value of stocks traded

Stocks traded, total value (% of GDP)[a] | 2012

Total value of shares traded during the period. This indicator complements the market capitalization ratio by showing whether market size is matched by trading.

Source: Standard and Poor's and World Bank and OECD GDP estimates; extracted from the World Bank's World Development Indicators database (2006–12). (http://data.worldbank.org/)

4.2.4 Venture capital deals

Venture capital per investment location: Number of deals (per trillion PPP$ GDP)[a] | 2014

Thomson Reuters data on private equity deals, per deal, with information on the location of investment, investment company, investor firms, and funds, among other details. The series corresponds to a query on venture capital deals from 1 January 2014 to 31 December 2014, with the data collected by investment location, for a total of 19,309 deals in 73 countries in 2014. The data are reported per trillion PPP$ GDP.

Source: Thomson Reuters, Thomson One Banker Private Equity database; International Monetary Fund, World Economic Outlook 2014 database, April 2015 (PPP$ GDP). (http://banker.thomsonib.com; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/download.aspx)

4.3 Trade and competition

4.3.1 Applied tariff rate, weighted mean

Tariff rate, applied, weighted mean, all products (%)[a,b] | 2012

The average of effectively applied rates weighted by the product import shares corresponding to each partner country. Data are classified using the Harmonized System of trade at the six- or eight-digit level. Tariff line data were matched to Standard International Trade Classification (SITC) revision 3 codes to define commodity groups and import weights. To the extent possible, specific rates have been converted to their ad valorem equivalent rates and have been included in the calculation of weighted mean tariffs. Effectively applied tariff rates at the six- and eight-digit product level are averaged for products in each commodity group. When the effectively applied rate is unavailable, the most-favoured nation rate is used instead. World Bank estimates use the World Integrated Trade Solution (WITS) system, based on tariff data from the UNCTAD Trade Analysis and Information System (TRAINS) database and import weights calculated using the UN Comtrade database.

Source: World Bank, based on WITS, UNCTAD TRAINS, and UN COMTRADE; extracted from the World Bank's World Development Indicators database (2005–12). (http://data.worldbank.org/)

4.3.2 Intensity of local competition

Average answer to the survey question: In your country, how intense is competition in the local markets? [1 = not intense at all; 7 = extremely intense] [†] | 2014

Source: World Economic Forum, Executive Opinion Survey 2014–2015 . (https://wefsurvey.org)

5 Business sophistication

5.1 Knowledge workers

5.1.1 Employment in knowledge-intensive services

Employment in knowledge-intensive services (% of workforce) | 2013

Sum of people in categories 1 to 3 as a percentage of total people employed, according to the International Standard Classification of Occupations (ISCO). Categories included: ISCO-08: 1 Managers, 2 Professionals, and 3 Technicians and associate professionals (years 2004–14); ISCO-88: 1 Legislators, senior officials and managers, 2 Professionals, 3 Technicians and associate professionals (2004–13); ISCO-1968: 1 Professional, technical and related workers (category 0 Armed forces is excluded), 2 Administrative and managerial workers, 3 Clerical and related workers (years 2004–08).

Source: International Labour Organization ILOSTAT Database of Labour Statistics (2004–14). (http://www.ilo.org/ilostat/)

5.1.2 Firms offering formal training

Firms offering formal training (% of firms) | 2013

The percentage of firms offering formal training programmes for their permanent, full-time employees.

Source: International Finance Corporation and World Bank, Enterprise Surveys (2005–13). (http://www.enterprisesurveys.org/)

5.1.3 GERD performed by business enterprise

GERD: Performed by business enterprise (% of GDP)[a] | 2013

Gross expenditure on R&D performed by business enterprise as a percentage of GDP.

Source: UNESCO Institute for Statistics, UIS online database (2004–13). (http://stats.uis.unesco.org)

5.1.4 GERD financed by business enterprise

GERD: Financed by business enterprise (% of total GERD)[a] | 2013

Percentage of gross expenditure on R&D financed by business enterprise.

Source: UNESCO Institute for Statistics, UIS online database (2007–14). (http://stats.uis.unesco.org)

5.1.5 Females employed with advanced degrees

Females employed with advanced degrees, % total employed (scaled by million population 25+ years old)[a] | 2013

The percentage of females employed with advanced degrees out of total employed. The employed comprise all persons of working age who, during a specified brief period, were in one of the following categories: (1) paid employment (whether at work or with a job but not at work); or (2) self-employment (whether at work or with an enterprise but not at work). Data are disaggregated by level of education, which refers to the highest level of education completed, classified according to the International Standard Classification of Education (ISCE). With special tabulation for Canada from Statistics Canada, Table 282-0004: Labour force survey estimates (LFS), by educational attainment, sex, and age group, annual (persons unless otherwise noted).

Source: International Labour Organization, ILOSTAT Annual Indicators (2005–14) and Statistics Canada, Table 282-0004; extracted from CANSIM, the Canadian socioeconomics database from Statistics Canada, accessed 22 April 2015. (http://www.ilo.org/ilostat/; http://laborsta.ilo.org/)

5.2 Innovation linkages

5.2.1 University/industry research collaboration

Average answer to the survey question: In your country, to what extent do business and universities collaborate on research and development (R&D)? [1 = do not collaborate at all; 7 = collaborate extensively] [†a] | 2014

Source: World Economic Forum, Executive Opinion Survey 2014–2015. (https://wefsurvey.org)

5.2.2 State of cluster development

Average answer to the survey question on the role of clusters in the economy: In your country, how widespread are well-developed and deep clusters (geographic concentrations of firms, suppliers, producers of related products and services, and specialized institutions in a particular field)? [1 = nonexistent; 7 = widespread in many fields] † | 2014

Source: World Economic Forum, Executive Opinion Survey 2014–2015. (https://wefsurvey.org)

5.2.3 GERD financed by abroad

GERD: Financed by abroad (% of total GERD) | 2013

Percentage of gross expenditure on R&D financed by abroad—i.e., with foreign financing.

Source: UNESCO Institute for Statistics, UIS online database (2007–14). (http://stats.uis.unesco.org)

5.2.4 Joint venture/strategic alliance deals

Joint ventures/strategic alliances: Number of deals, fractional counting (per trillion PPP$ GDP)[a] | 2014

Thomson Reuters data on joint ventures/strategic alliances deals, per deal, with details on the country of origin of partner firms, among others. The series corresponds to a query on joint venture/strategic alliance deals from 1 January 2014 to 31 December 2014, for a total of 1,623 deals announced in 2014, with firms headquartered in 104 participating economies. Each participating nation of each company in a deal (*n* countries per deal) gets, per deal, a score equivalent to 1/*n* (with the effect that all country scores add up to 1,623). The data are reported per trillion PPP$ GDP.

Source: Thomson Reuters, Thomson One Banker Private Equity, SDC Platinum database; International Monetary Fund World Economic Outlook database, April 2015 (PPP$ GDP) (2014). (http://banker.thomsonib.com; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/download.aspx)

5.2.5 Patent families filed in at least three offices

Number of patent families filed by residents in at least three offices (per billion PPP$ GDP)[a] | 2011

A 'patent family' is defined as a set of interrelated patent applications filed in one or more countries/jurisdictions to protect the same invention. In this report, 'patent families data' refers to patent applications filed by residents in at least three IP offices; the data are scaled by PPP$ GDP (billions). A 'patent' is a set of exclusive rights granted by law to applicants for inventions that are new, non-obvious, and commercially applicable. It is valid for a limited period of time (generally 20 years), during which patent holders can commercially exploit their inventions on an exclusive basis. In return, applicants are obliged to disclose their inventions to the public in a manner that enables others, skilled in the art, to replicate the invention. The patent system is designed to encourage innovation by providing innovators with time-limited exclusive legal rights, thus enabling innovators to appropriate a return on their innovative activity.

Source: World Intellectual Property Organization, WIPO Statistics Database; International Monetary Fund, World Economic Outlook database, April 2015 (PPP$ GDP) (2004–11). (http://www.wipo.int//ipstats/; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/download.aspx)

5.3 Knowledge absorption

5.3.1 Royalties and license fees payments

Royalty and license fees, payments (% of total trade) [a] | 2013

Royalties and license fees payments (% of total trade) according to the Extended Balance of Payments Services Classification EBOPS 2002—i.e., code 266 Royalties and license fees (including franchises and similar rights) as a percentage of total trade. 'Total trade' is defined as the sum of total imports code G100 goods and code S200CS commercial services (excluding government services) plus total exports of code G100 goods and code S200CS commercial services (excluding government services), divided by 2. According to the fifth edition of the International Monetary Fund's *Balance of Payments Manual*, the item 'Goods' covers general merchandise, goods for processing, repairs on goods, goods procured in ports by carriers, and nonmonetary gold. The 'commercial services' category is defined as being equal to 'services' minus 'government services, not included elsewhere'. Receipts are between residents and nonresidents for the authorized use of intangible, nonproduced, nonfinancial assets and proprietary rights (such as patents, copyrights, trademarks, industrial processes, and franchises) and for the use, through licensing agreements, of produced originals of prototypes (such as films and manuscripts).

Note: There has been a change in the data source from the International Monetary Fund to the Organisation for Economic Co-operation and Development, which has affected the year-on-year comparability of this indicator.

Source: World Trade Organization, Trade in Commercial Services database, itself based on the fifth (1993) edition of the International Monetary Fund's Balance of Payments Manual and Balance of Payments database (2009–13). (http://stat.wto.org/StatisticalProgram/WSDBStatProgramSeries.aspx?Language=E; http://unstats.un.org/unsd/tradeserv/EBOPS2002_eng.pdf)

5.3.2 High-tech imports

High-tech net imports (% of total trade) | 2013

High-technology imports minus re-imports (% of total trade). The list of commodities contains technical products with a high intensity of R&D, based on the Eurostat classification, itself based on SITC Rev.4 and the Organisation for Economic Co-operation and Development (OECD) definition. Commodities belong to the following sectors: aerospace; computers & office machines; electronics, telecommunications; pharmacy; scientific instruments; electrical machinery; chemistry; non-electrical machinery; and armament.

Source: United Nations, COMTRADE database; Eurostat, 'High-technology' aggregations based on SITC Rev. 4, April 2009 (2011–13). (http://comtrade.un.org/; http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/htec_esms_an5.pdf)

5.3.3 Communications, computer and information services imports

Communications, computer and information services imports (% of total trade) | 2013

Communication, computer and information services imports (% of total trade) according to the Extended Balance of Payments Services Classification EBOPS 2002, including codes 245 Communications services (postal, courier services, and telecommunications services); and 262 Computer and information services, as a percentage of total trade.

Source: World Trade Organization, Trade in Commercial Services database, itself based on the fifth (1993) edition of the International Monetary Fund's Balance of Payments Manual and Balance of Payments database (2008–13). (http://stat.wto.org/StatisticalProgram/WSDBStatProgramSeries.aspx?Language=E; http://unstats.un.org/unsd/tradeserv/EBOPS2002_eng.pdf)

5.3.4 Foreign direct investment net inflows

Foreign direct investment (FDI), net inflows (% of GDP) | 2013

Net inflows of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP.

Source: International Monetary Fund, International Financial Statistics and data files, and World Bank and OECD GDP estimates; extracted from the World Bank's World Development Indicators database (2012–13). (http://data.worldbank.org/)

6 Knowledge and technology outputs

6.1 Knowledge creation

6.1.1 National office resident patent applications

Number of patent applications filed by residents at the national patent office (per billion PPP$ GDP)[a] | 2013

Number of patent applications filed by residents at the national patent office. Data are scaled by PPP$ GDP (billions). 'Patent' is defined in the description of indicator 5.2.5. Patent applications by resident data are based on 'equivalent count', where applications at regional offices are equivalent to multiple applications, one in each of the states that is a member of those offices. To calculate the number of equivalent patent applications for the Eurasian Patent Office (EAPO) and the African Intellectual Property Organization (OAPI), each application is multiplied by the corresponding number of member states. For the European Patent Office (EPO) and the African Regional Intellectual Property Organization (ARIPO), each application is counted as one application abroad if the applicant does not reside in a member state or as one resident and one application abroad if the applicant resides in a member state. The equivalent applications concept is used only for reporting data by origin. A resident application refers to an application filed with the IP office of or acting for the state or jurisdiction in which the first-named applicant in the application has residence.

Source: World Intellectual Property Organization, WIPO Statistics Database; International Monetary Fund, World Economic Outlook database, April 2015 (PPP$ GDP) (2010–13). (http://www.wipo.int//ipstats/; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/download.aspx)

6.1.2 Patent Cooperation Treaty resident applications

Number of international patent applications filed by residents at the Patent Cooperation Treaty (per billion PPP$ GDP)[a] | 2014

Number of international patent applications filed by residents under the World Intellectual Property Organization (WIPO)-administered Patent Cooperation Treaty (PCT). Data are reported for PCT member countries only, and scaled by PPP$ GDP (billions). PCT applications are assigned to a particular country of origin according to the country of residence of the first-named applicant. The PCT system simplifies the process of multiple national patent filings by reducing the requirement to file a separate application in each jurisdiction. However, the decision of whether to grant patent rights remains in the hands of national and regional patent offices, and the patent rights remain limited to the jurisdiction of the patent-granting authority. The PCT international application process starts with the international phase, during which an international search and, possibly, a preliminary examination are performed, and concludes with the national phase, during which national and regional patent offices decide on the patentability of an invention according to national law.

Source: World Intellectual Property Organization, WIPO Statistics Database; International Monetary Fund, World Economic Outlook database, April 2015 (PPP$ GDP) (2012–14). (http://www.wipo.int//ipstats/; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/download.aspx)

6.1.3 National office resident utility model applications

Number of utility model applications filed by residents at the national patent office (per billion PPP$ GDP) | 2013

Number of utility model (UM) applications filed by residents at the national patent office. Resident UM data are scaled by PPP$ GDP (billions). UM is a special form of patent right granted by a state/jurisdiction to an inventor or inventor's assignee for a fixed period of time. The terms and conditions for granting a utility model are slightly different from those for normal patents (including a shorter term of protection and less stringent patentability requirements). The term 'utility model' can also describe what are known in certain countries as 'petty patents', 'short-term patents', or 'innovation patents'.

Source: World Intellectual Property Organization, WIPO Statistics Database; International Monetary Fund, World Economic Outlook database, April 2015 (PPP$ GDP) (2010–13). (http://www.wipo.int//ipstats/; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/download.aspx)

6.1.4 Scientific and technical publications

Number of scientific and technical journal articles (per billion PPP$ GDP)[a] | 2014

The number of scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences. Article counts are from a set of journals covered by the Science Citation Index (SCI) and the Social Sciences Citation Index (SSCI). Articles are classified by year of publication and assigned to each country/economy on basis of the institutional address(es) listed on the article. Articles are counted on a count basis (rather than a fractional basis)—that is, for articles with collaborating institutions from multiple countries/economies, each country/economy receives credit on the basis of its participating institutions. The data are reported per trillion PPP$ GDP.

Source: Special tabulations from Thomson Reuters, Web of Science, Science Citation Index (SCI) and Social Sciences Citation Index (SSCI); International Monetary Fund, World Economic Outlook 2014 database, April 2015 (PPP$ GDP). (http://thomsonreuters.com/products_services/science/; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/download.aspx)

6.1.5 Citable documents H index

The H index is the economy's number of published articles (H) that have received at least H citations in the period 1996–2013.*[a] | 2013

The H index is an economy's number of published articles (H) that have received at least H citations in the period 1996–2013. It quantifies both country scientific productivity and scientific impact and is also applicable to scientists, journals, etc. The SCImago Journal & Country Rank is a portal that includes journal and economy scientific indicators developed from the information contained in the Scopus® database (Elsevier B.V.). This platform takes its name from the SCImago Journal

Rank (SJR), developed by SCImago from the algorithm Google PageRank™. The H index is tabulated from the number of citations received in subsequent years by articles published in a given year, divided by the number of articles published that year.

Source: SCImago (2007) SJR—SCImago Journal & Country Rank. Retrieved February 2014. (http://www.scimagojr.com)

6.2 Knowledge impact

6.2.1 Growth rate of GDP per person engaged

Growth rate of GDP per person engaged (constant 1990 PPP$) | 2013

Growth of gross domestic product (GDP) per person engaged provides a measure of labour productivity (defined as output per unit of labour input). GDP per person employed is GDP divided by total employment in the economy. PPP$ GDP is converted to 1990 constant international dollars using PPP rates. An international dollar has the same purchasing power over GDP that a US dollar has in the United States of America.

Source: The Conference Board Total Economy Database™ Output, Labor and Labor Productivity Country Details, 1950–2013, January 2014. (https://www.conference-board.org/data/economydatabase/).

6.2.2 New business density

New business density (new registrations per thousand population 15–64 years old)[a] | 2012

Number of new firms, defined as firms registered in the current year of reporting, per thousand population aged 15–64 years old.

Source: World Bank, Doing Business 2014, Entrepreneurship (2007–12). (http://www.doingbusiness.org/data/exploretopics/entrepreneurship)

6.2.3 Total computer software spending

Total computer software spending (% of GDP)[a] | 2013

Computer software spending includes the total value of purchased or leased packaged software such as operating systems, database systems, programming tools, utilities, and applications. It excludes expenditures for internal software development and outsourced custom software development. The data are a combination of actual figures and estimates. Data are reported as a percentage of GDP.

Source: IHS Global Insight, Information and Communication Technology Database; International Monetary Fund, World Economic Outlook 2014 database, April 2015 (current US$ GDP). (http://www.ihsglobalinsight.com/ProductsServices/ProductDetail2370.htm; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/download.aspx)

6.2.4 ISO 9001 quality certificates

ISO 9001 Quality management systems—Requirements: Number of certificates issued (per billion PPP$ GDP)[a] | 2013

Number of certificates of conformity to standard 'ISO 9001:2008 Quality management systems—Requirements' issued, according to the ISO Survey. Single-site and multiple-site certificates are not distinguished. The data are reported per billion PPP$ GDP. Refer to indicator 3.3.3 for details.

Source: International Organization for Standardization (ISO), The ISO Survey of Management System Standard Certifications, 1999–2012; International Monetary Fund, World Economic Outlook database, April 2015 (PPP$ GDP) (2013). (http://www.iso.org; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/weoselgr.aspx)

6.2.5 High-tech and medium-high-tech output

High-tech and medium-high-tech output (% of total manufactures output)[a] | 2011

High-tech and medium-high-tech output as a percentage of total manufactures output, on the basis of the Organisation for Economic Co-operation and Development (OECD) classification of Technology Intensity Definition, itself based on International Standard Industrial Classification ISIC Revision 3.

Source: United Nations Industrial Development Organization (UNIDO), Industrial Statistics Database, 3- and 4-digit level of International Standard Industrial Classification ISIC Revision 3 (INDSTAT4 2012); OECD, Directorate for Science, Technology and Industry, Economic Analysis and Statistics Division, 'ISIC REV. 3 Technology Intensity Definition: Classification of Manufacturing Industries into Categories Based on R&D Intensities', 7 July 2011 (2004–11). (http://www.unido.org/statistics.html; http://unstats.un.org/unsd/cr/registry/regcst.asp?cl=27; http://www.oecd.org/sti/ind/48350231.pdf)

6.3 Knowledge diffusion

6.3.1 Royalties and license fees receipts

Royalty and license fees, receipts (% of total trade)[a] | 2013

Royalties and license fees receipts (% of total trade) according to the Extended Balance of Payments Services Classification EBOPS 2002—i.e., code 266 Royalties and license fees (including franchises and similar rights) as a percentage of total trade. Receipts are between residents and nonresidents for the authorized use of intangible, nonproduced, nonfinancial assets and proprietary rights (such as patents, copyrights, trademarks, industrial processes, and franchises) and for the use, through licensing agreements, of produced originals of prototypes (such as films and manuscripts).

Note: There has been a change in data source from the International Monetary Fund to the Organisation for Economic Co-operation and Development, which has affected the year-on-year comparability of this indicators.

Source: World Trade Organization, Trade in Commercial Services database, itself based on the fifth (1993) edition of the International Monetary Fund's Balance of Payments Manual and Balance of Payments database (2007–13). (http://stat.wto.org/StatisticalProgram/WSDBStatProgramSeries.aspx?Language=E; http://unstats.un.org/unsd/tradeserv/EBOPS2002_eng.pdf)

6.3.2 High-tech exports

High-tech net exports (% of total trade)[a] | 2013

High-technology exports minus re-exports (% of total trade). See indicator 5.3.2 for details.

Source: United Nations, COMTRADE database; Eurostat 'High-technology' aggregations based on SITC Rev. 4, April 2009 (2011–13). (http://comtrade.un.org/; http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/htec_esms_an5.pdf)

6.3.3 Communications, computer and information services exports

Communications, computer and information services exports (% of total trade)[a] | 2013

Communication, computer and information services exports (% of total trade) according to the Extended Balance of Payments Services Classification EBOPS 2002, including codes 245 Communications services (postal, courier services, and telecommunications services) and 262 Computer and information services, as a percentage of total trade.

Source: World Trade Organization, Trade in Commercial Services database, itself based on the fifth (1993) edition of the International Monetary Fund's Balance of Payments Manual and Balance of Payments database (2006–13). (http://stat.wto.org/StatisticalProgram/WSDBStatProgramSeries.aspx?Language=E; http://unstats.un.org/unsd/tradeserv/EBOPS2002_eng.pdf)

6.3.4 Foreign direct investment net outflows

Foreign direct investment (FDI), net outflows (% of GDP) | 2013

Net outflows of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net outflows of investment from the reporting economy to the rest of the world and is divided by GDP.

Source: International Monetary Fund, International Financial Statistics and data files, and World Bank and OECD GDP estimates; extracted from the World Bank's World Development Indicators database (2010–13). (http://data.worldbank.org/)

7 Creative outputs

7.1 Intangible assets

7.1.1 National office resident trademark applications

Number of trademark applications issued to residents by the national office (per billion PPP$ GDP) | 2013

Number of trademark applications at the national trademark office, based on equivalent class counts. 'Class count' refers to the number of classes specified in a trademark application or registration. Data are scaled by PPP$ GDP (billions). A 'trademark' is a distinctive sign that identifies certain goods or services as those produced or provided by a specific person or enterprise. The holder of a trademark application has the legal right to exclusive use of the mark in relation to the products or services for which it is registered. The owner can prevent unauthorized use of the trademark, or a confusingly similar mark, so as to prevent consumers and the public in general from being misled. Unlike patents, trademarks can be maintained indefinitely by paying renewal fees. The procedures for registering trademarks are governed by the rules and regulations of national and regional IP offices. Trademark rights are limited to the jurisdiction of the authority that registers the trademark. Resident trademark registrations are based on equivalent class counts. In the international trademark system and at certain offices, an applicant can file a trademark application that specifies one or more of the 45 goods and services classes of the Nice Classification. Offices use either a single- or multi-class filing system. For example, the offices of Japan, the Republic of Korea, and the United States of America as well as many European offices have multi-class filing systems. The offices of Brazil, Mexico, and South Africa follow a single-class filing system, requiring a separate application for each class in which applicants seek trademark protection. To capture the differences in application numbers across offices, it is useful to compare their respective registration class counts. 'Equivalent registrations' refers to registrations at regional offices and are equivalent to multiple registrations, one in each of the states that is a member of those offices. To calculate the number of equivalent registrations for regional office data, each registration is multiplied by the corresponding number of member states.

Source: World Intellectual Property Organization, WIPO Statistics Database; International Monetary Fund, World Economic Outlook database, April 2015 (PPP$ GDP) (2010–13). (http://www.wipo.int//ipstats/; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/download.aspx)

7.1.2 Madrid System trademark applications by country of origin

Number of international trademark applications issued through the Madrid System by country of origin (per billion PPP$ GDP)[a] | 2014

Number of international trademark applications by country of origin under the WIPO-administered Madrid System. Data are reported for Madrid member countries only, and scaled by PPP$ GDP (billions). 'Trademark' is defined in the description of indicator 7.1.1. The Madrid System for the International Registration of Marks, established under the Madrid Agreement and the Madrid Protocol and administered by WIPO, makes it possible for an applicant to register a trademark in a large number of countries by filing a single application at their national or regional IP office that is party to the System. The Madrid System simplifies the process of multinational trademark registration by reducing the requirement to file separate applications at each office. It also simplifies the subsequent management of the mark, since it is possible to record changes or to renew the registration through a single procedural step. Registration through the Madrid System does not create an 'international' trademark, and the decision to register or refuse the trademark remains in the hands of national and/or regional office(s). Trademark rights are limited to the jurisdiction of the trademark registration office(s).

Source: World Intellectual Property Organization, WIPO Statistics Database; International Monetary Fund, World Economic Outlook database, April 2015 (PPP$ GDP) (2013–14). (http://www.wipo.int//ipstats/; http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/download.aspx)

7.1.3 ICTs and business model creation

Average answer to the question: In your country, to what extent do ICTs enable new business models? [1 = not at all; 7 = to a great extent][†] | 2014

Source: World Economic Forum, Executive Opinion Survey 2013–2014. (https://wefsurvey.org)

7.1.4 ICTs and organizational models creation

Average answer to the question: In your country, to what extent do ICTs enable new organizational models (e.g. virtual teams, remote working, telecommuting) within businesses? [1 = not at all; 7 = to a great extent][†] | 2014

Source: World Economic Forum, Executive Opinion Survey 2013–2014. (https://wefsurvey.org)

7.2 Creative goods and services

7.2.1 Cultural and creative services exports

Cultural and creative services exports (% of total trade)[a] | 2012

Creative services exports (% of total exports) according to the Extended Balance of Payments Services Classification EBOPS 2002—that is, EBOPS code 264 Information services; code 278 Advertising, market research and public opinion polling; code 288 Audiovisual and related services; and code 897 Other, personal, cultural and recreational services as a percentage of total trade. The score for the United States of America (USA) includes the category Film and TV tape distribution in the absence of available data for code 288 Audiovisual and related services. The category Film and tape distribution is specific to the USA and does not have a code. However, these transactions have been classified by the USA under the EBOPS item 266 (Royalties and licence fees).

Source: World Trade Organization, Trade in Commercial Services database, itself based on the fifth (1993) edition of the International Monetary Fund's Balance of Payments Manual and Balance of Payments database (2004–13). (http://stat.wto.org/StatisticalProgram/WSDBStatProgramSeries.aspx?Language=E; http://unstats.un.org/unsd/tradeserv/EBOPS2002_eng.pdf)

7.2.2 National feature films produced

Number of national feature films produced (per million population 15–69 years old)[a] | 2013

A film with a running time of 60 minutes or longer. It includes works of fiction, animation, and documentaries. It is intended for commercial exhibition in cinemas. Feature films produced exclusively for television broadcasting, as well as newsreels and advertising films, are excluded. Data are reported per million population 15–69 years old. For Cambodia and Cameroon, this indicator covers only feature films in video format; for Slovenia, feature films with a running time of 75 minutes or longer.

Source: UNESCO Institute for Statistics, UIS online database; United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2012 Revision (population data) (2008–13). (http://stats.uis.unesco.org; http://esa.un.org/unpd/wpp/Excel-Data/population.htm)

7.2.3 Global entertainment and media output

Global entertainment and media output (per thousand population 15–69 years old)*[a] | 2013

The Global entertainment and media outlook (the Outlook) provides global analysis for consumer and advertising spend with like-for-like, five-year historical and forecast data across 13 industry segments in 59 countries. The Outlook allows one to compare and contrast regional growth rates and consumer and advertising spend. The segments covered by the Outlook are: TV subscriptions and license fees; TV advertising; Internet access; radio; out-of-home advertising; video games; filmed entertainment; newspaper publishing; consumer magazine publishing; business-to-business markets; Internet advertising; and consumer and educational book publishing and music. The score and rankings for the Global Media Expenditures for the 59 countries considered in this report are based on advertising and consumer digital and non-digital data in US$ millions at average 2012 exchange rates for the year 2012. These results are reported normalized per thousand population, 15–69 years old, for the year 2013. The figures for Algeria, Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, and United Arab Emirates were estimated from a total corresponding to Middle East and North Africa (MENA) countries using a breakdown of total GDP (current US$) for the above-mentioned countries to define referential percentages.

Source: The source of the data for the base of these calculations was derived from PwC's Global entertainment and media outlook, 2013–2017; United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2012 Revision (population data). (http://www.pwc.com/outlook; http://stats.uis.unesco.org; http://esa.un.org/unpd/wpp/Excel-Data/population.htm)

7.2.4 Printing and publishing output

Printing and publishing manufactures output (% of manufactures total output) | 2011

Publishing, printing, and reproduction of recorded media output (ISIC Rev. 3 code 22) as a percentage of total manufacturing output (ISIC rev.3 code D).

Source: United Nations Industrial Development Organization, Industrial Statistics Database; 2-digit level of International Standard Industrial Classification ISIC Revision 3 (INDSTAT4 2012) (2004–11). (http://www.unido.org/statistics.html; http://unstats.un.org/unsd/cr/registry/regcst.asp?cl=2)

7.2.5 Creative goods exports

Creative goods exports (% of total trade) | 2013

Total value of creative goods exports, net of re-exports (current US$) over total trade. 'Total trade' is defined as the sum of total imports code G100 goods and code S200CS commercial services (excluding government services) plus total exports of code G100 goods and code S200CS commercial services (excluding government services), divided by 2. According to the fifth edition of the International Monetary Fund's *Balance of Payments Manual*, the category 'goods' covers general merchandise, goods for processing, repairs on goods, goods procured in ports by carriers, and non-monetary gold. The 'commercial services' category is defined as being equal to 'services' minus 'government services, not included elsewhere'.

Source: United Nations, COMTRADE database; 2009 UNESCO Framework for Cultural Statistics, Table 3, International trade of cultural goods and services based on the 2007 Harmonised System (HS 2007); World Trade Organization, Trade in Commercial Services database, itself based on the fifth (1993) edition of the International Monetary Fund's Balance of Payments Manual and Balance of Payments database(2008–13). (http://unctadstat.unctad.org/; http://www.uis.unesco.org/culture/Documents/framework-cultural-statistics-culture-2009-en.pdf; http://stat.wto.org/StatisticalProgram/WSDBStatProgramSeries.aspx?Language=E)

7.3 Online creativity

7.3.1 Generic top-level domains (gTLDs)

Generic top-level domains gTLDs (per thousand population 15–69 years old) | 2014

A generic top-level domain (gTLD) is one of the categories of top-level domains (TLDs) maintained by the Internet Assigned Numbers Authority (IANA) for use in the Internet. Generic TLDs can be unrestricted (com, info, net, and org) or restricted—that is, used on the basis of fulfilling eligibility criteria (biz, name, and pro). Of these, the statistic covers the five generic domains biz, info, org, net, and com. Generic domains .name and .pro, and sponsored domains (arpa, aero, asia, cat, coop, edu, gov, int, jobs, mil, museum, tel, travel, and xxx) are not included. Neither are country-code top-level domains (refer to indicator 7.3.2). The statistic represents the total number of registered domains (i.e., net totals by December 2014, existing domains + new registrations – expired domains). Data are collected on the basis of a 4% random sample of the total population of domains drawn from the root zone files (a complete listing of active domains) for each TLD. The geographic location of a domain is determined by the registration address for the domain name registrant that is returned from a whois query. These registration data are parsed by country and postal code and then aggregated to any number of geographic levels such as county, city, or country/economy. The original hard data were scaled by thousand population 15–69 years old. For confidentiality reasons, only normalized values are reported; while relative positions are preserved, magnitudes are not.

Source: ZookNIC Inc; United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2012 Revision (population data). (http://www.zooknic.com; http://esa.un.org/unpd/wpp/Excel-Data/population.htm)

7.3.2 Country-code top-level domains (ccTLDs)

Country-code top-level domains ccTLDs (per thousand population 15–69 years old) | 2014

A country-code top-level domain (ccTLD) is one of the categories of top-level domains (TLDs) maintained by the Internet Assigned Numbers Authority (IANA) for use in the Internet. Country-code TLDs are two-letter domains especially designated for a particular economy, country, or autonomous territory (there are 324 ccTLDs, in various alphabets/characters). The statistic represents the total number of registered domains (i.e., net totals by December 2014, existing domains + new registrations – expired domains). Data are collected from the registry responsible for each ccTLD and represent the total number of domain registrations in the ccTLD. Each ccTLD is assigned to the country with which it is associated rather than based on the registration address of the registrant. ZookNIC reports that, for the ccTLDs it covers, 85–100% of domains are registered in the same country; the only exceptions are the ccTLDs that have been licensed for commercial worldwide use. Of this year's GII sample of countries, this is the case for the ccTLDs of the following economies: Armenia am, Austria at, Belarus by, Belgium be, Canada ca, Colombia co, Denmark dk, Finland fi, Iceland is, India in, Iran ir, Italy it, Latvia lv, Mauritius mu, Moldova md, Mongolia mn, Montenegro me, Nicaragua ni, Serbia rs, Seychelles sc, Slovenia si, Spain es, and Switzerland ch (this list is based on www.wikipedia.org). Data are reported per thousand population 15–69 years old. For confidentiality reasons, only normalized values are reported; while relative positions are preserved, magnitudes are not.

Source: ZookNIC Inc; United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2012 Revision (population data). (http://www.zooknic.com; http://esa.un.org/unpd/wpp/Excel-Data/population.htm)

7.3.3 Wikipedia monthly edits

Wikipedia monthly page edits (per million population 15–69 years old) | 2014

Data extracted from Wikimedia Traffic Analysis Report, Wikipedia Page Edits per Country, Overview on the portal http://www.wikipedia.org. The count of monthly page edits data is based on a 1:1,000 sampled server log (squids), averages of quarterly reports. Countries are included only if the number of page edits in the period exceeds 100,000 (100 matching records in 1:1,000 sampled log). Page edits by bots are not included. Also all IP addresses that occur more than once on a given day are discarded for that day. A few false negatives are taken for granted. Data are reported per million population 15–69 years old.

Source: Wikimedia Foundation; United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2012 Revision (population data). (http://stats.wikimedia.org/wikimedia/squids/SquidReportsCountriesLanguagesVisitsEdits.htm; http://esa.un.org/unpd/wpp/Excel-Data/population.htm)

7.3.4 Video uploads on YouTube

Number of video uploads on YouTube (scaled by population 15–69 years old)* | 2014

Total number of video uploads on YouTube, per country, scaled by population 15–69 years old. The raw data are survey based: the country of affiliation is chosen by each user on the basis of a multi-choice selection. This metric counts all video upload events by users. The following countries are reported with n/a because of total or partial service blockage: China (YouTube blocked for 2,711 days) and Iran (YouTube blocked for 2,095 days). For confidentiality reasons, only normalized values are reported; while relative positions are preserved, magnitudes are not.

Source: Google, parent company of YouTube; United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2012 Revision (population data). (http://www.youtube.com; http://esa.un.org/unpd/wpp/Excel-Data/population.htm; http://www.comscore.com/Industries/Media)

Appendix IV

Technical Notes

Technical Notes

Audit by the Joint Research Centre of the European Commission

The Joint Research Centre (JRC) of the European Commission has researched extensively on the complexity of composite indicators ranking economies' performances along policy lines. For the fifth consecutive year, the JRC has agreed to perform a thorough robustness and sensitivity analysis of the Global Innovation Index (GII) to look at some structural changes made to the list of indicators by the GII developing team (see Table 1 of Annex 2 to Chapter 1 for more details).

An earlier version of the 2015 GII model was submitted to the JRC in May 2015. The recommendations and flexibilities allowed by the JRC preliminary audit were taken into account in the final version of the GII model and are explained below as appropriate.

A final audit was performed in June on that last model, the results of which are included in Annex 3 to Chapter 1.

Composite indicators

The GII relies on seven pillars. Each pillar is divided into three sub-pillars, and each sub-pillar is composed of two to five individual indicators. Each sub-pillar score is calculated as the weighted average of its individual indicators. Each pillar score is calculated as the weighted average of its sub-pillar scores.

The notion of weights as importance coefficients was, as in the previous three years, discarded to ensure a greater statistical coherence of the model, following the recommendations of the JRC.[1]

The GII includes three indices and one ratio:

1. The Innovation Input Sub-Index is the simple average of the first five pillar scores.
2. The Innovation Output Sub-Index is the simple average of the last two pillar scores.
3. The Global Innovation Index is the simple average of the Input and Output Sub-Index scores.
4. The Innovation Efficiency Ratio is the ratio of the Output Sub-Index score over the Input Sub-Index score.

Country/economy rankings are provided for indicator, sub-pillar, pillar, and index scores.

The Innovation Efficiency Ratio serves to highlight those economies that have achieved more with less as well as those that lag behind in terms of fulfilling their innovation potential. In theory, assuming that innovation results go hand in hand with innovation enablers, efficiency ratios should evolve around the number one. This measure thus allows us to complement the GII by providing an insight that should be neutral to the development stages of economies.[2]

Individual indicators

The model includes 79 indicators, which fall within the following three categories:

1. quantitative/objective/hard data (55 indicators),
2. composite indicators/index data (19 indicators), and
3. survey/qualitative/subjective/soft data (5 indicators).

Hard data

Hard data series (55 indicators) are drawn from a variety of public and private sources such as United Nations agencies (the United Nations Educational, Scientific and Cultural Organization, the World Intellectual Property Organization), the World Bank, PwC, Thomson Reuters, and IHS Global Insight.

Indicators are often correlated with population, gross domestic product (GDP), or some other size-related factor; they require scaling by some relevant size indicator for economy comparisons to be valid. Most indicators are either scaled at the source or do not need to be scaled; for the rest, the scaling factor was chosen to represent a fair picture of economy differences. This affected 41 indicators, which can be broadly divided into four groups:

1. Indicators 2.1.1, 2.3.2, 3.2.3, 4.1.2, 4.1.3, 4.2.2, 4.2.3, 5.1.3, 5.3.4, 6.2.3, and 6.3.4 were scaled by GDP in current US dollars.[3]

2. The count variables 3.3.3, 4.2.4, 5.2.4, 5.2.5, 6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.2.4, 7.1.1, and 7.1.2 were scaled by GDP in purchasing power parity current international dollars (PPP$ GDP). This choice of denominator was dictated by a willingness to appropriately account for differences in development stages; in addition, scaling these variables by population would improperly bias results to the detriment of economies with large young or large ageing populations.[4]

3. Variables 5.1.5, 6.2.2, 7.2.2, 7.2.3, 7.3.1, 7.3.2, 7.3.3, and 7.3.4 were scaled by population (population 25+ years old for 5.1.5, population 15–64 years old for 6.2.2, and population 15–69 years old for the rest).[5]

4. Sectoral indicators 5.3.1, 5.3.2, 5.3.3, 6.3.1, 6.3.2, 6.3.3, and 7.2.1 were scaled by total trade; indicators 5.3.2, 6.2.5, 6.3.2, and 7.2.4 were scaled by the total unit corresponding to the particular statistic.[6]

Indices

Composite indicators come from a series of specialized agencies and academic institutions such as the World Bank, the International Telecommunication Union (ITU), the UN Public Administration Network (UNPAN), and Yale and Columbia Universities. Statisticians discourage the use of an 'index within an index' on two main grounds: the distorting effect of the use of different computing methodologies and the risk of duplicating variables. The normalization procedure partially solves for the former issue (more on this below). To avoid incurring the mistake of including a particular indicator more than once (directly and indirectly through a composite indicator), only indices with a narrow focus (19 in total) were selected.

Any remaining downside is outweighed by the gains in terms of model parsimony, acknowledgement of expert opinion, and focus on multi-dimensional phenomena that can hardly be captured by a single indicator.[7]

Survey data

Survey data are drawn from the World Economic Forum's Executive Opinion Survey (EOS). Survey questions are drafted to capture subjective perceptions on specific topics; five EOS questions were retained to capture phenomena strongly linked to innovative activities for which hard data either do not exist or have low economy coverage.

Country/economy coverage and missing data

This year's GII covers 141 economies, which were selected on the basis of the availability of data. Economies with a minimum indicator coverage of 48 indicators out of 79 (60%) and with scores for at least two sub-pillars per pillar were retained. These criteria were determined jointly with the JRC this year. The last record available for each economy was considered, with a cut-off at year 2004. For the sake of transparency and replicability of results, no additional effort was made to fill missing values. Missing values are indicated with 'n/a' and are not considered in the sub-pillar score. However, the JRC audit assessed the robustness of the GII modelling choices (i.e., no imputation of missing data, fixed predefined weights, and arithmetic averages) by imputing missing data, applying random weights, and using geometric averages. Since 2012, on the basis of this assessment, a confidence interval is provided for each ranking in the GII as well as the Input and Output Sub-Indices (see Annex 3 to Chapter 1).

Treatment of series with outliers

Potentially problematic indicators with outliers that could polarize results and unduly bias the rankings were treated according to the rules listed below, following the recommendations of the JRC. This affected 32 out of the 55 hard data indicators.

First rule: Selection

The identification of indicators as problematic used skewness or kurtosis. The problematic indicators had either:

- an absolute value of skewness greater than 2, *or*
- a kurtosis greater than 3.5.[8]

Second rule: Treatment

Series with one to five outliers (29 cases) were winsorized: The values distorting the indicator distribution were assigned the next highest value, up to the level where skewness and/or kurtosis entered within the ranges specified above.[9]

For series with six or more outliers (three cases), skewness and/or kurtosis entered within the ranges specified above after multiplication by a given factor *f* and transformation by natural logs.[10] Since only 'goods' were affected (i.e., indicators for which higher values indicate better outcomes, as opposed to 'bads'), the formula used was:

$$\ln\left[\frac{(\max \times f - 1)\ (\text{economy value} - \min)}{\max - \min} + 1\right]^{11}$$

where 'min' and 'max' are the minimum and maximum indicator sample values.

Normalization

The 79 indicators were then normalized into the [0, 100] range, with higher scores representing better outcomes. Normalization was made according to the min-max method, where the min and max values were given by the minimum and maximum indicator sample values respectively, except for index and survey data, for which the original series' range of values was kept as min and max values (for example, [1, 7] for the World Economic Forum Executive Opinion Survey questions; [0, 100] for World Bank's World Governance Indicators; [0, 10] for ITU indices, etc.). The following formula was applied:

- **Goods:**

$$\frac{\text{economy value} - \min}{\max - \min} \times 100$$

- **Bads:**

$$\frac{\max - \text{economy value}}{\max - \min} \times 100$$

Notes

1 Paruolo et al. (2013) show that a theoretical inconsistency exists between the real theoretical meaning of weights and the meaning generally attributed to them by the standard practice in constructing composite indicators that use them as importance coefficients in combination with linear aggregation rules. The approach followed in the GII this year is to assign weights of 0.5 or 1.0 to each component in a composite to ensure the highest correlations between them (i.e., indicator/sub-pillar, sub-pillar/pillar, etc.). Two sub-pillars (7.2 Creative goods and services, and 7.3 Online creativity) and 36 indicators (1.2.1, 1.2.2, 2.1.4, 2.1.5, 2.2.1, 2.2.3, 3.2.1, 3.2.2, 3.3.3, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 5.1.3, 5.1.4, 5.1.5, 5.2.1, 5.2.4, 5.2.5, 5.3.1, 6.1.1, 6.1.2, 6.1.4, 6.1.5, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.3.1, 6.3.2, 6.3.3, 7.1.2, 7.2.1, 7.2.2, and 7.2.3) are weighted 0.5; the rest have a weight of 1. Five indicators with Pearson correlation coefficients with their respective sub-pillar scores below 0.5 were kept in the model to ensure a conceptual coherence (as opposed to a statistical coherence) in the belief that some cyclical (as opposed to structural) dimension might be at the source of their behaviour as 'noise' (see also Annex 3 to Chapter 1): GERD financed by abroad (5.2.3), FDI net inflows (5.3.4), growth rate of GDP per person engaged (6.2.1), new business density (6.2.2), and printing and publishing output (7.2.4).

2 To account for differences in development, other composite indicators use weighting schemes differentiated by income level.

3 These indicators are expenditure on education (2.1.1), gross expenditure on R&D (2.3.2), gross capital formation (3.2.3), domestic credit to private sector (4.1.2), microfinance institutions' gross loan portfolio (4.1.3), market capitalization (4.2.2), total value of stocks traded (4.2.3), GERD performed by business enterprise (5.1.3), foreign direct investment net inflows (5.3.4), total computer software spending (6.2.3), and foreign direct investment net outflows (6.3.4).

4 These count variables are mainly indicators that increase disproportionately with economic growth. They include: ISO 14001 environmental (3.3.3) and ISO 9001 quality (6.2.4) certificates issued; venture capital (4.2.4) and joint venture and strategic alliance (5.2.4) deals; Patent Cooperation Treaty (PCT) published patent family applications filed in at least three offices (5.2.5); resident patent applications at the national office (6.1.1) and at the PCT (6.1.2); national office resident utility model applications (6.1.3); publications in scientific and technical journals (6.1.4); national office resident trademark applications (7.1.1); and trademark applications under the Madrid System by country of origin (7.1.2).

5 These variables are females employed with advanced degrees (5.1.5), new business density (6.2.2), national feature films produced (7.2.2), global entertainment and media composite output (7.2.3), generic (7.3.1) and country-code (7.3.2) top-level Internet domains, Wikipedia monthly edits (7.3.3), and video uploads on YouTube (7.3.4).

6 Royalty and license fees payments (5.3.1); high-tech goods imports minus re-imports (5.3.2); communication, computer, information services imports (5.3.3); royalty and license fees receipts (6.3.1); high-tech goods exports minus re-exports (6.3.2); communication, computer, and information services exports (6.3.3); cultural and creative services exports (7.2.1); and creative goods exports minus re-exports (7.2.5) were scaled by total trade; high-tech and medium-high-tech output (6.2.5); and printing and publishing output (7.2.4) were scaled by total manufactures output.

7 For example, GII sub-pillar 3.1 Information and communication technologies (ICTs) is composed of four indices: ITU's ICT Access and Use sub-indices and UNPAN's Government Online Service and E-Participation Indices. The first two are components of ITU's ICT Development Index together with an ICT skills sub-index that was not considered, as it duplicates GII pillar 2. Similarly, the Online Service Index is a component of UNPAN's E-Government Development Index together with two indices on Telecommunication Infrastructure and Human Capital that were not considered, as they duplicate GII pillars 3 and 2, respectively. The e-Participation Index was developed separately by UNPAN in 2010.

8 Based on Groeneveld and Meeden (1984), which sets the criteria of absolute skewness above 1 and kurtosis above 3.5. The skewness criterion was relaxed to account for the small sample at hand (141 economies).

9 This distributional issue affects the following variables: 4.2.2, 4.2.4, 5.2.4, 5.3.2, 5.3.3, 6.1.5, 6.2.4, 7.1.1, and 7.2.1 (1 outlier); 3.2.1, 3.3.3, 4.2.3, and 5.3.4 (2 outliers); 1.2.3, 4.1.3, 6.1.3, 6.2.2, and 6.3.3 (3 outliers); and 2.2.3, 5.3.1, 6.1.1, 6.3.4, 7.1.2, 7.2.4, and 7.3.1 (4 outliers). The treatment criterion was relaxed last year to allow series with 5 outliers to be winsorized instead of subjected to natural log transformation. Two indicator series (7.2.2 and 7.3.2) with 5 outliers each required no further transformation once these were winsorized.

10 This distributional issue affects variables 7.2.5 (factor *f* of 1); 5.2.5 and 6.3.1 (factor *f* of 10)

11 The corresponding formula for bads is:

$$\ln\left[\frac{(\max \times f - 1) \times (\max - \text{economy value})}{\max - \min} + 1\right]$$

These formulas achieve two things: converting all series into 'goods' and scaling the series to the range [1, max] so that natural logs are positive starting at 0.

References

Groeneveld, R. A. and G. Meeden. 1984. 'Measuring Skewness and Kurtosis'. *The Statistician* 33: 391–99.

Paruolo P., M. Saisana, and A. Saltelli. 2013. 'Ratings and Rankings: Voodoo or Science?' *Journal of the Royal Statistical Society* A 176(2), doi: 0964–1998/13/176000.

Appendix V

About the Authors

About the Authors

Robert D. Atkinson is the Founder and President of the Information Technology and Innovation Foundation, a Washington, DC-based policy think tank. He is also the author of *Innovation Economics: The Race for Global Advantage* (Yale, 2012) and *The Past and Future of America's Economy: Long Waves of Innovation that Power Cycles of Growth* (Edward Elgar, 2005). Before coming to ITIF, Dr Atkinson was Vice President of the Progressive Policy Institute and Director of PPI's Technology & New Economy Project. Previously he served as the first Executive Director of the Rhode Island Economic Policy Council, a public-private partnership including as members the governor, legislative leaders, and corporate and labour leaders. Dr Atkinson currently serves as Co-Chair of the White House Office of Science and Technology Policy's China-U.S. Innovation Policy Experts Group, as a member of the U.S. State Department's Advisory Committee on International Communications and Information Policy, and as a member of the U.S. Department of Commerce's National Advisory Council on Innovation and Entrepreneurship. In 2013 the New Republic named Dr Atkinson one of 'the three most important thinkers about innovation'. He received his Master of Urban and Regional Planning from the University of Oregon and was named a distinguished alumnus in 2014. He received his PhD in City and Regional Planning from the University of North Carolina at Chapel Hill.

Alexandra L. Bernard joined Cornell University in September 2013. She is the Project Manager of the Global Innovation Index 2015. Her previous professional experience includes working as a senior consultant in the transfer pricing international tax team at PwC in Melbourne, Australia. Prior to that she was a financial analyst for Australia and New Zealand Banking Group. She has also worked as a senior event coordinator for an Australian event management company, which involved running tour marketing campaigns, brand management activations, and social media development. She obtained her Bachelor of Commerce from Monash University in Melbourne, Australia.

Cristina Chaminade is a Full Professor in Innovation Studies at the Centre for Innovation, Research and Competence in the Learning Economy (CIRCLE) at Lund University (Sweden). Her area of expertise is in the globalization of innovation, particularly global innovation networks and innovation in emerging economies. She has actively worked on innovation in developing countries such as China, India, South Africa, Thailand, and Brazil for over 15 years. Professor Chaminade's research focuses mainly on understanding how firms, regions, and nations create and use knowledge for innovation when knowledge is globally distributed, and how policies can be designed to support innovation in a global context. She has been an advisor to international organizations such as the European Commission, UNCTAD, the OECD, and UN-ECLAC. Professor Chaminade has published in international journals, refereed books, and handbooks in the fields of innovation, development studies, and knowledge management. Currently she is coordinating two research projects dealing with the globalization of innovation: one on technology-driven investments by emerging multinationals in Europe and another on regional variety and global innovation networks, funded by Riksbanken and the Wallenberg Foundation, respectively.

Dongmin Chen is one of the Advisory Board members of the Global Innovation Index. He is Dean of the School of Innovation and Entrepreneurship and Director of the Science and Technology Development Office of Peking University. He is responsible for the university's innovation capacity development including corporate sponsor research, IP licensing, spin-offs, seed funding, and regional innovation/incubation centres. He is a Chaired Professor in the Academy for Advanced Interdisciplinary Studies of Peking University. Dr Chen is a Silicon Valley serial entrepreneur and a co-founder of two start-up companies. He is a co-inventor of the MEMS-CMOS 3D integration technology and has an IP portfolio with more than 100 international patents that have been successfully licensed to a major foundry in Asia. Dr Chen was an Adjunct Professor of the Institute of Physics, Chinese Academy of Sciences, where he served as the co-director of the Beijing National Laboratory for Condensed Matter Physics from 2004 to 2009. He was a Senior Rowland Fellow and the Head of the Nanoscale Quantum Physics Lab at Harvard University from 1989 to 2004. He has co-authored more than 70 scientific publications, and is an Associate Editor and board member of *Applied Physics Letters*.

Jibak Dasgupta is currently with the Confederation of Indian Industry (CII) as Deputy Director, heading the Innovation and Entrepreneurship Vertical in the organization. He works closely with industry and government on policy issues and the implementation of national-level programmes. He has been associated with India's National Innovation Council (NInC) and contributed to the Innovation Cluster project for the development of Indian small- and medium-sized enterprises. He represents CII in several government committees in India, such as the national committee for setting up innovation hubs under the National Council of Science Museums (NCSM) and the national committee for overviewing tax exemptions for existing Technology Business Incubators (TBIS) under the National Science and Technology Entrepreneurship Development Board (NSTEDB). He has recently been nominated to be part of the Governing Council of Indian National Academy of Engineering (INAE) beginning in 2016. Earlier he worked for Global Innovation and Technology Alliance (GITA) in the areas of collaborative R&D and technology transfer. He also worked for a short period as a Management Consultant for quality certifications such as ISO and CMMI and has been associated with Swedish start-ups in the field of cashless micropayments. Mr Dasgupta has an MSc degree in Management and Economics of Innovation from Chalmers University of Technology, Gothenburgh, Sweden. Prior to that he completed his BE in Instrumentation Technology from Visvesvaraya Technological University, Belgaum, India, and worked for Infosys as a software professional.

Marcos Domínguez-Torreiro is a Post-Doc Researcher at the Composite Indicators Research Group (COIN) of the Joint Research Centre of the European Commission (Italy), where he conducts research and policy support tasks in the field of econometrics and applied statistics. After his undergraduate studies in Economics and Business Administration, he completed his doctoral thesis in Applied Economics at the University of Vigo, Spain. His past work experience includes the private sector, universities, and public administration. He has co-authored books and research articles dealing with finance, environmental and natural resource economics, rural development, and institutional economics.

Soumitra Dutta is the Anne and Elmer Lindseth Dean and Professor of Management at the Samuel Curtis Johnson Graduate School of Management at Cornell University, New York. Prior to July 2012, he was the Roland Berger Chaired Professor of Business and Technology at INSEAD and the founding director of eLab, a centre of excellence in the digital economy. His current research is on technology strategy and innovation policies at both corporate and national levels. He has won several awards for research and pedagogy and is actively involved in strategy and policy consulting. His research has been showcased in the global media and he has received a number of awards, including the Light of India Award '12 (from the Times of India media group) and the Global Innovation Award '13 (from INNOVEX in Israel). Professor Dutta obtained his PhD in Computer Science and his MSc in Business Administration from the University of California at Berkeley.

Julius Ecuru is an Assistant Executive Secretary at the Uganda National Council for Science and Technology (UNCST). He has expertise in areas connected with research and innovation, particularly in low-income countries. These relate specifically to research/technology management, innovation systems development, and bioethics including human, environment, and social safeguards in the advancement of science and technology. He is currently leading a regional bioscience research and innovation policy consortium for East Africa, which is part of the Bio-Innovate Africa Program. Dr Ecuru is also a non-resident fellow of the African Centre for Technology Studies (ACTS). He has recently engaged with the Bioscience east and central Africa-International Livestock Research Institute Hub (BecA-ILRI Hub) in strategy and programme development. Dr Ecuru holds a PhD in Technology and Technoscience Studies from Makerere University, Kampala, and Blekinge Institute of Technology, Sweden, respectively. His doctoral research explored ways of understanding and unlocking potentials of innovation systems in low-resource settings.

Kai Engel, Partner and Managing Director for Germany, A.T. Kearney, is the global lead partner for A.T. Kearney's Innovation and Product Creation Services Practice. He led numerous consulting projects to improve operations excellence in large corporations along the value chain. The projects focused on increasing clients' capabilities in the areas of innovation and product creation management, manufacturing efficiency as well as its manufacturing network set up, supply chain management, and supply management. He has served large global corporate clients as well as mid-sized companies and governmental organizations representing industries such as automotive, aerospace and defence, consumer goods, engineering, high tech, machinery, process, chemicals, and private equity funds. He also co-founded the European Innovation Management Academy, and, in coordination with the EU Commission, the IMP^{3}rove platform that provides knowledge-intensive services to small- and medium-sized businesses around the globe. Dr Engel regularly chairs top executive roundtables and is a frequent speaker for business and industry conferences. He has authored several books including *Masters of Innovation* (LID Publishing, 2015), *Innovation Management,* and *Best Innovators—Successful Strategies of Innovation Leaders,* the latter two in German. Dr Engel also serves on the supervisory board of the European Innovation Management Academy (www.improve-innovation.eu) and the editorial board of *Innovation Manager* magazine and is an advisor on the World Economic Forum's 'Fostering Innovation-Driven Entrepreneurship in Europe' and 'Collaborative Innovation' initiatives. Dr Engel studied Mechanical Engineering, focusing on production and material technologies. He earned his PhD in Laser Technology and holds a degree in Business Administration. Prior to A.T. Kearney, he worked in the high-tech industry heading R&D departments and managed large and complex facility investment projects.

Rafael Escalona Reynoso has been Lead Researcher at the Global innovation Index since October 2013. His previous professional experience includes working as Economic and Science and Technology Policy Advisor to the Senate of Mexico and as a member of the Trade and Foreign Investment Advisory Board at the office of the President of Mexico. His research experience at Cornell University includes comparative studies between Mexico and Spain on the regulatory aspects of modern biotechnology and the biosafety of genetically modified organisms (GMOs), and on the reach of intellectual property rights (IPRs) in the information technologies era. He holds a PhD in Regional Planning and a Master of Public Administration from Cornell University as well as a BA in Economics from Universidad Panamericana in Mexico.

Stephen Ezell is Vice President, Global Innovation Policy with the Information Technology and Innovation Foundation (ITIF), a Washington, DC-based technology and economic policy think tank, where he focuses on science, technology, and innovation policy as well as international competitiveness, trade, and manufacturing policy issues. He is the co-author with Dr Robert Atkinson of *Innovation Economics: The Race for Global Advantage* (Yale, 2012). Mr Ezell came to ITIF from Peer Insight, an innovation research and consulting firm he co-founded in 2003. He previously worked in the new product development group at the NASDAQ Stock Market. Mr Ezell holds a BS from the School of Foreign Service at Georgetown University with an Honors Certificate from Georgetown's Landegger Program in International Business Diplomacy (IBD).

Micheline Goedhuys is a Research Fellow at UNU-MERIT, an institute of United Nations University and Maastricht University, based in Maastricht (www.merit.unu.edu). Prior to joining UNU-MERIT in 2004, she worked at the International Labour Organisation (UN-ILO) in Tanzania and at the University of Antwerp, Belgium. With over 20 years of experience as researcher, she has published widely on topics such as entrepreneurship, small business development, innovation measurement, and the performance of firms in developing countries, particularly Africa. She has worked as a consultant for several international organizations, including the World Bank and the UN-ILO. She has served as a policy advisor to the Flemish Authorities on growth policy. She acts as facilitator in the 'Design and Evaluation of an Innovation Policy (DEIP)' training programme organized by UNU-MERIT for policy makers in developing countries (www.merit.unu.edu/training/design-and-evaluation-of-innovation-policy-in-developing-countries-deip) and the Globelics Academy (www.globelics.org). She holds a PhD in Economics from the University of Leuven (K.U. Leuven), Belgium.

Senapathy 'Kris' Gopalakrishnan, one of the co-founders of Infosys, served as its Vice Chairman from 2011 to 2014 and as its Chief Executive Officer and Managing Director from 2007 to 2011. Recognized as a global business and technology thought leader, he was voted the top CEO (IT services category) in *Institutional Investor*'s inaugural ranking of Asia's top executives. He was selected as one of the winners of the 2nd Asian Corporate Director Recognition Awards by Corporate Governance Asia in 2011. Mr Gopalakrishnan was also selected to Thinkers 50, an elite list of global business thinkers, in 2009. He was elected President of India's apex industry chamber, the Confederation of Indian Industry (CII), for 2013–14, and served as one of the co-chairs of the World Economic Forum in Davos in January 2014. In January 2011 the Government of India awarded Mr Gopalakrishnan the Padma Bhushan, the country's third-highest civilian honour. He serves on the Boards of Governors of the Indian Institute of Technology, Madras, and the Indian Institute of Management, Bangalore. He is the Chairman of the Board of Governors of IIT, Bangalore, and is also on the Board of Trustees of the Chennai Mathematical Institute. He holds a Master of Physics and Computer Science from the Indian Institute of Technology, Madras.

Francesca Guadagno is an Economist at the World Intellectual Property Organization (WIPO). Her research interests cover the broad area of innovation and development, with a particular focus on the role of public policies for innovation and industrial development. Before joining WIPO, she was Policy Officer at the European Centre for Development Policy Management (ECDPM) in Maastricht. She has contributed to policy-oriented research in projects with the Asian Development Bank, the Dutch Ministry of Foreign Affairs, the Gates Foundation, and the E15 Initiative. She holds a Master of Economics and Management of Innovation from Bocconi University (Milan, Italy), a second Master of Management of Innovation from the Rotterdam School of Management (the Netherlands), and a PhD from the UNU-MERIT (Maastricht University) School of Business and Economics.

Lei Guo is the Associate Dean of the School of Innovation and Entrepreneurship and the Deputy Director of the Office of Science and Technology Development at Peking University, China. She is an Associate Research Professor at Peking University and is responsible for the innovative and entrepreneurial education and research. Her current work focuses on entrepreneurial talent development programmes both on and off campus, and incubating the start-ups. Her research interest is to support, evaluate, and develop the regional innovation-driven economic growth systems. She is the coordinator for the GII programme between Peking University and WIPO. She holds a PhD in Life Sciences from Peking University and a dual Bachelor of Science and Bachelor of Economics degree from Wuhan University in China.

Hugo Hollanders is an Economist and Senior Researcher at UNU-MERIT (Maastricht University) where he is the coordinator of the Innovation Systems Indicators and Policy Research Group. He is also a member of the Advisory Board to the Global Innovation Index. He has over 15 years of experience in innovation studies and innovation statistics and has been involved in various projects for the European Commission on measuring innovation at the national, regional, and industry levels, and has been the main author of the *Innovation Union Scoreboard*. He has been a member of several expert groups on measuring innovation for the European Commission (including the 2010 High-Level Panel on the Measurement of Innovation and the 2013 Expert Group on Public Sector Innovation); the National Endowment for Science, Technology and the Arts (NESTA)'s expert group on the UK innovation index; and the 2011–2014 Advisory Steering Committee for the South-African Centre for Science, Technology and Innovation Indicators (CeSTII).

Dick Kawooya is an Assistant Professor at the University of South Carolina School of Library and Information Science (SLIS). Most recently he was part of the African Innovation Research and Training Project and network, Open AIR, under which he studied the role of intellectual property in the exchange and interactions between informal and formal sectors in Africa's emerging automotive industry. He was the Lead Researcher for the African Copyright and Access to Knowledge (ACA2K) Project (2007–10). Dr Kawooya holds a PhD in Communication and Information from the University of Tennessee. His doctoral research explored Ugandan traditional musicians' construction of ownership. Dr Kawooya held an Open Society Institute (OSI) Fellowship in 2006–07 at the Center for Policy Studies, Central European University, Budapest, conducting research on the impact of copyright on the representation of African knowledge and access to general knowledge (e.g., e-resources). He has served as a member of the Commonwealth of Learning (CoL) Copyright Expert Group and as Uganda's national copyright expert (representing the Consortium of Ugandan University Libraries) for the international Electronic Information for Libraries (eIFL). He has attended, and presented at, several meetings of the World Intellectual Property Organization (WIPO), including the June 2005 Inter-sessional Intergovernmental Meeting (IIM) on a Development Agenda for WIPO.

Bruno Lanvin is INSEAD's Executive Director for Global Indices. From 2007 to 2015 he was the Executive Director of INSEAD's eLab, managing INSEAD's teams in Paris, Singapore, and Abu Dhabi and then Executive Director for INSEAD's European Competitiveness Initiative (IECI). From 2000 to 2007 Dr Lanvin worked for the World Bank, where he was inter alia Senior Advisor for E-strategies and Regional Coordinator (Europe and Central Asia) for ICT and e-government issues. He also headed the Capacity Building Practice of the World Bank's Global ICT Department and was Chairman of the Bank's e-Thematic Group. From June 2001 to December 2003, he was the Manager of the Information for Development Program (infoDev) at the World Bank. In 2000 Dr Lanvin was appointed Executive Secretary of the G8-DOT Force. Until then, he was Head of Electronic Commerce in the United Nations Conference on Trade and Development (UNCTAD) in Geneva, and occupied various senior positions including Chief of the Cabinet of the Director General of the United Nations in New York, Head of Strategic Planning, and later Chief of the SME Trade Competitiveness Unit of UNCTAD/SITE. He was the main drafter, team leader, and editor of *Building Confidence: Electronic Commerce and Development*, published in January 2000. Since 2002, he has been co-authoring *The Global Information Technology Report* (INSEAD-World Economic Forum-Cornell University); he is currently the co-editor of the *Global Innovation Index* report (INSEAD-WIPO-Cornell University). He holds a BA in Mathematics and Physics from the University of Valenciennes (France), an MBA from Ecole des Hautes Etudes Commerciales (HEC) in Paris, and a PhD in Economics from the University of Paris I (La Sorbonne) in France. A frequent speaker at high-level meetings, he advises a number of global companies and governments and is a member of numerous boards, including those of ICANN and IDA-Infocomm in Singapore. He is a Commissioner on the Broadband Commission.

Pierre Mohnen is Professor of Micro-Econometrics of Technical Change at Maastricht University and Professorial Fellow at UNU-MERIT (the Maastricht Economic and social Research and training institute on Innovation and Technology of the United Nations University). He is also an Associated Fellow at CIRANO (the Center for Interuniversity Research and the Analysis on Organizations), Senior Research Associate at the Technology & Management Center for Development at Oxford University, and Associated Research Professor at ETH, Zürich. He is a regular visiting professor at foreign universities. He was Professor of Economics at the University of Quebec in Montreal from 1984 to 2001, where he directed the graduate programme in economics for four years. He has done consulting work for various international organizations and national government departments. He sits on various scientific boards, advisory committees, and expert groups. In 2010 he was the President of the EPIP (European Policy on Intellectual Property) association. Through the United Nations University he regularly lectures on the design and the evaluation of innovation policies in developing countries. At UNU-MERIT he coordinates the micro-based evidence research on innovation and technological change. His research focuses on R&D, innovation, productivity, international trade, and industrial organization. He is currently involved in various projects related to the effectiveness of R&D tax incentives and R&D subsidies, complementarities in innovation policies, the effect of regulations on green innovation, the link between innovation and employment, and innovation in developing countries. Dr Mohnen has an MA in Economics from the Catholic University of Louvain and a PhD in Economics from New York University.

Maria Moskovko is a Research Assistant at the Centre for Innovation, Research and Competence in the Learning Economy at Lund University. She holds an MSc European Affairs degree from Lund University's Political Science Department. Ms Moskovko's interests within the field of innovation are transforming innovation systems and links between innovation and development. Prior to her research pursuits at Lund University, she worked at the Council of Europe, where she was involved in the reform of the Ukrainian judicial system. She also has eight years of hands-on experience in facilitating international academic exchanges via the international non-profit organization American Councils for International Education.

Bitange Ndemo is an Associate Professor of Entrepreneurship at the University of Nairobi's Business School. His research centres on the link between ICTs and small- and medium-sized enterprises in Kenya with an emphasis on inclusive innovations and how ICTs influence economic development in Kenya. Professor Ndemo is an advisor to several organizations including the Better than Cash Alliance, a global initiative under UNCDF dedicated to promotion of cash alternatives; and the I-Hub, a premier innovation hub in Africa. He also sits in the Board of Research ICT Africa, based in South Africa. He is the immediate former Permanent Secretary of Kenya's Ministry of Information and Communication in Kenya, where he was credited with facilitating many transformative ICT projects. After years of developing the supply side of broadband, he has now changed gears to demand side through assisting start-ups in Kenya and actively playing a key role in building sustainable models of innovation hubs. Professor Ndemo holds a PhD in Industrial Economics from the University of Sheffield in the UK and a Bachelor's degree in Finance and Accounting from the University of Minnesota. He is an Open Data/Big Data evangelist and dedicated to the simplification (visualization) of data for ordinary citizens to consume.

Rajah Rasiah is Professor of Economics and Technology Management on the Faculty of Economics and Administration, University of Malaya. He was the first holder of the Khazanah Nasional Chair of Regulatory Studies; he is also a Professorial Fellow at UNU-MERIT and a member of the GLOBELICS scientific board, as well as an advisory member of the Industrial Development Research Centre, Zhejiang University. Additionally he is a member of the National Science Research Council, Malaysia, and an advisory member of the Export Committee of the Ministry of International Trade and Industry, Malaysia. He has contributed extensively to projects commissioned by UNCTAD, the World Bank, ILO, UNIDO, UNESCO, UNDP, and WIPO in Africa, Asia, and Latin America. He obtained his Doctorate in Economics from Cambridge University in 1992 and was a Rajawali Fellow at Harvard University in 2014. He is the 2014 recipient of the Celso Furtado prize from the World Academy of Sciences for his contributions to the field of social sciences.

Martin Ruppert is Managing Director of IMP^{3}rove – European Innovation Management Academy (www.improve-innovation.eu) and a core team member of the Innovation and R&D Management practice at A.T. Kearney. Building on various consulting projects, he has comprehensive experience in innovation management, ranging from innovation strategy development and innovation project portfolio analysis to the development of innovative business models. He has been seconded to the World Economic Forum to manage the initiative 'Fostering Innovation-Driven Entrepreurship in Europe'. Currently he is part of the project team for the WEF follow-on initiative 'Collaborative Innovation'. Dr Ruppert holds a PhD from the Graduate School of Risk Management at the University of Cologne, and a Diploma in the combined studies of Mathematics and Business Administration from TU Darmstadt.

Michaela Saisana leads the Composite Indicators Research Group (COIN) at the European Commission, Joint Research Centre (JRC, Italy). She conducts and coordinates research on the monitoring of multidimensional phenomena that feed into EU policy formulation and legislation. She collaborates, by auditing performance indices, with over 100 international organizations and world-class universities, including the United Nations, UNICEF, Transparency International, the World Economic Forum, INSEAD, the World Intellectual Property Organization, Yale University, Columbia University, and Harvard University. Her publications deal with composite indicators, multicriteria analysis, multi-objective optimization, data envelopment analysis, and sensitivity analysis (20 peer-reviewed articles, 2 books, 60 working papers). She offers regular trainings/seminars on composite indicators (over 30 trainings and 60 invited lectures). In 2004 she was awarded the European Commission's JRC Young Scientist Prize in Statistics and Econometrics in recognition of her research on composite indicators. She has a PhD and an MSc in Chemical Engineering.

Martin Schaaper has been Head of the Science, Technology and Innovation Statistics unit at the UNESCO Institute for Statistics since 2009. His work consists of collecting and analysing internationally comparable STI indicators from all countries in world, as well as developing methodology and building capacity in developing countries for the collection of these indicators. Before joining UNESCO, he worked for eight years for the OECD, where he was responsible for the co-operation with non-OECD countries in the fields of STI and ICT statistics; and six years for various small companies, which were working on a contract basis for Eurostat on a variety of statistics.

Justin Shepherd is a Manager in A.T. Kearney's Dubai office. A former member of A.T. Kearney's Global Business Policy Council, he specializes in scenario planning, strategic foresight, and competitiveness and innovation projects for public and private sector clients globally. He was previously seconded by A.T. Kearney to manage the World Economic Forum project 'Rethinking Personal Data.' He holds an MA in International Relations and an MBA, both from George Washington University, and a BA in Philosophy and Classics from St. John's College.

Sacha Wunsch-Vincent is Senior Economic Officer under the Chief Economist at the World Intellectual Property Organization (WIPO). He is one of the main authors of the *World Intellectual Property Report* and the *Global Innovation Index,* and contributes to the new economic work of the organization. His primary research foci and current area of work are concerned with the interaction of innovation, intellectual property, and economic development. Before joining WIPO, he was an Economist at the OECD Directorate for Science, Technology, and Industry for seven years. Before that he was the Swiss National Science Fellow at the Berkeley Center for Law and Technology (University of California, Berkeley) and the Washington-based institute for International Economics. He has served as advisor to organizations such as the World Bank and the World Economic Forum, and has testified before national governments and parliaments. Dr Wunsch-Vincent holds a Master of International Economics from MERIT, University of Maastricht, and a PhD in Economics from the University of St. Gallen, Switzerland. He teaches International Economics at Sciences Po Paris.

Xiao-Shan Yap is a Post-Doctoral Researcher at the Faculty of Economics and Administration, University of Malaya. Her research area includes industrial and technological transitions, innovation systems, organizational capability building, and value chains and networks, with a primary focus on developing countries. She has done consultancy work for the Economic Research Institute for ASEAN and East Asia (ERIA) and UNCTAD. She holds a PhD in Development Studies from the Faculty of Economics and Administration, University of Malaya, and a BA in Business and Marketing Management from Oxford Brookes University.

Shilin Zheng is an Associate Researcher at the Institute of Quantitative Technical Economics, Chinese Academy of Social Sciences. He is also a Research Fellow at the School of Innovation and Entrepreneurship at Perking University. He received his PhD in Science and Engineering Management at the Beijing University of Science and Technology, and was a postdoctoral fellow at Guanghua School of Management and School of Innovation and Entrepreneurship, Peking University. From 2007 to 2009 he was a visiting PhD student at the University of Texas at Arlington. His current research is on technological economics, innovation policies, and industrial economics. He has published many papers in the *China Economic Review* and the *Economic Research Journal* (Chinese language).

Innovation is firmly recognized as a central driver of economic growth and development. The Global Innovation Index (GII) aims to capture the multi-dimensional facets of innovation and provide the tools that can assist in tailoring policies to promote long-term output growth, improved productivity, and job growth. The GII helps to create an environment in which innovation factors are continually evaluated. It provides a key tool and a rich database of detailed metrics for 141 economies this year, which represent 95.1% of the world's population and 98.6% of global GDP.

Innovation-driven growth is no longer the prerogative of high-income countries alone. Developing countries increasingly craft policies to increase their innovation capacity. For this purpose, *The Global Innovation Index 2015: Effective Innovation Policies for Development* is timely and relevant. The analysis in this year's edition identifies economies that outperform on an annual basis against countries with a similar level of development, both on the general innovation level as well as on the level of particular innovation inputs or outputs. Taking advantage of the rich information produced by the GII analysis in its past editions, the outcome of effective innovation policies can be reviewed to provide more information to support the effectiveness and the degree of development these policies have on the 'innovation outperformer' countries. The chapters in this year's report focus specifically on economies identified in this way, reviewing their position in the GII rankings and determining which innovation policies have been effective, and which have not.

Launched by INSEAD in 2007, the GII project today is co-published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations. This year the GII draws on the support and expertise of its Knowledge Partners: the Confederation of Indian Industry, du, A.T. Kearney, and the IMP^{3}rove – European Innovation Management Academy, as well as an Advisory Board of 15 eminent international experts. For the fifth consecutive year, the Joint Research Centre (JRC) of the European Commission performed a thorough robustness and sensitivity analysis of the index.

The GII is concerned primarily with improving the journey towards a better way to measure and understand innovation and with identifying targeted policies, good practices, and other levers that can foster innovation. Written in a nontechnical language and style, the GII appeals to diverse groups including policy makers, business leaders, academics, and multiple organizations of civil society.

The full report can be downloaded at **www.globalinnovationindex.org.**

ISBN 9782952221085
9 782952 221085