ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

EDUCATION AND TRAINING FOR ENTREPRENEURSHIP, CREATIVITY AND INNOVATION

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OECD/CERI

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OECD/CERI Innovation Strategy

- Horizontal programme in OECD, started in 2008, due to be finalized in 2010
- More open and dynamic concept of innovation
- Strong focus on human capital: CERI
  - Skills and education for innovation
  - Innovation of education

> *"Education and training systems should equip people with the foundations to learn and develop the broad range of skills needed for innovation in all of its forms, and with the flexibility to upgrade skills and adapt to changing market conditions."*

OECD/CERI Innovation Strategy

- Innovation will be key for the post-crisis recovery, for new economic growth and for future social progress
- But innovation is more than R&D or technology
  - Knowledge-intensive innovation is all sectors, public and private
  - Non-technological innovation is important
  - Open concept of innovation:
    - User-driven innovation
    - Collaboration is crucial

OECD/CERI Innovation Strategy

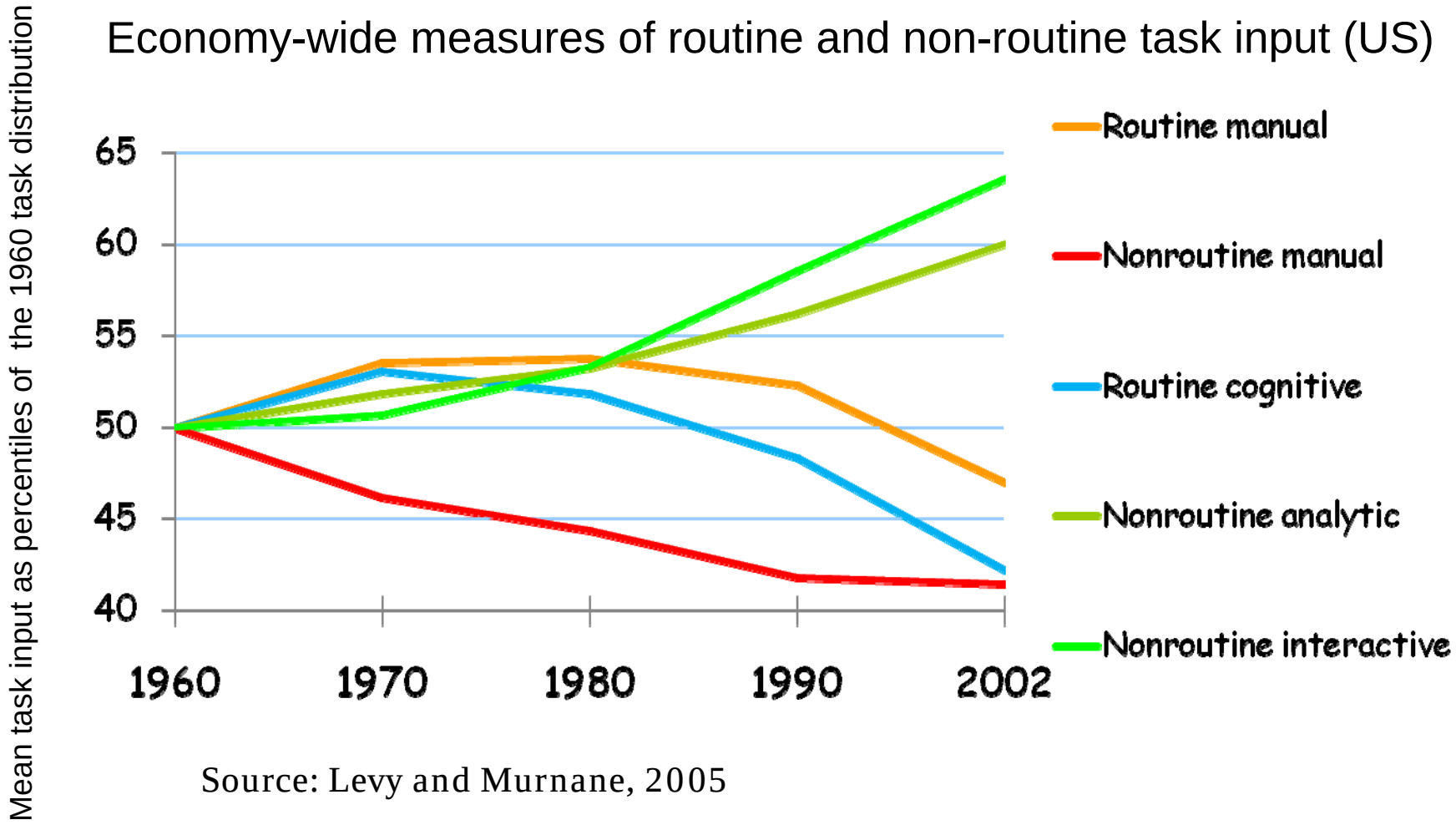
- The new concept of innovation will depend very much on human capital
  - Lack of skills hinders innovation
- Skills needed for innovation are wide-ranging
  - Basic skills and literacies
  - Academic and technical skills
  - Generic and 'soft' skills
  - General skills but also diverse skills sets
  - Changing demand in skills over time

Questions

- What skills (competences) do we need for an innovative economy and society?
  - Which are needed in innovative firms?
  - Which are rewarded in learning organisations with higher levels of work complexity…?
- How can we redesign education and training systems so that they are better able to produce these skills effectively?
  - At basic/foundation level
  - At excellence level

Changing skills demand

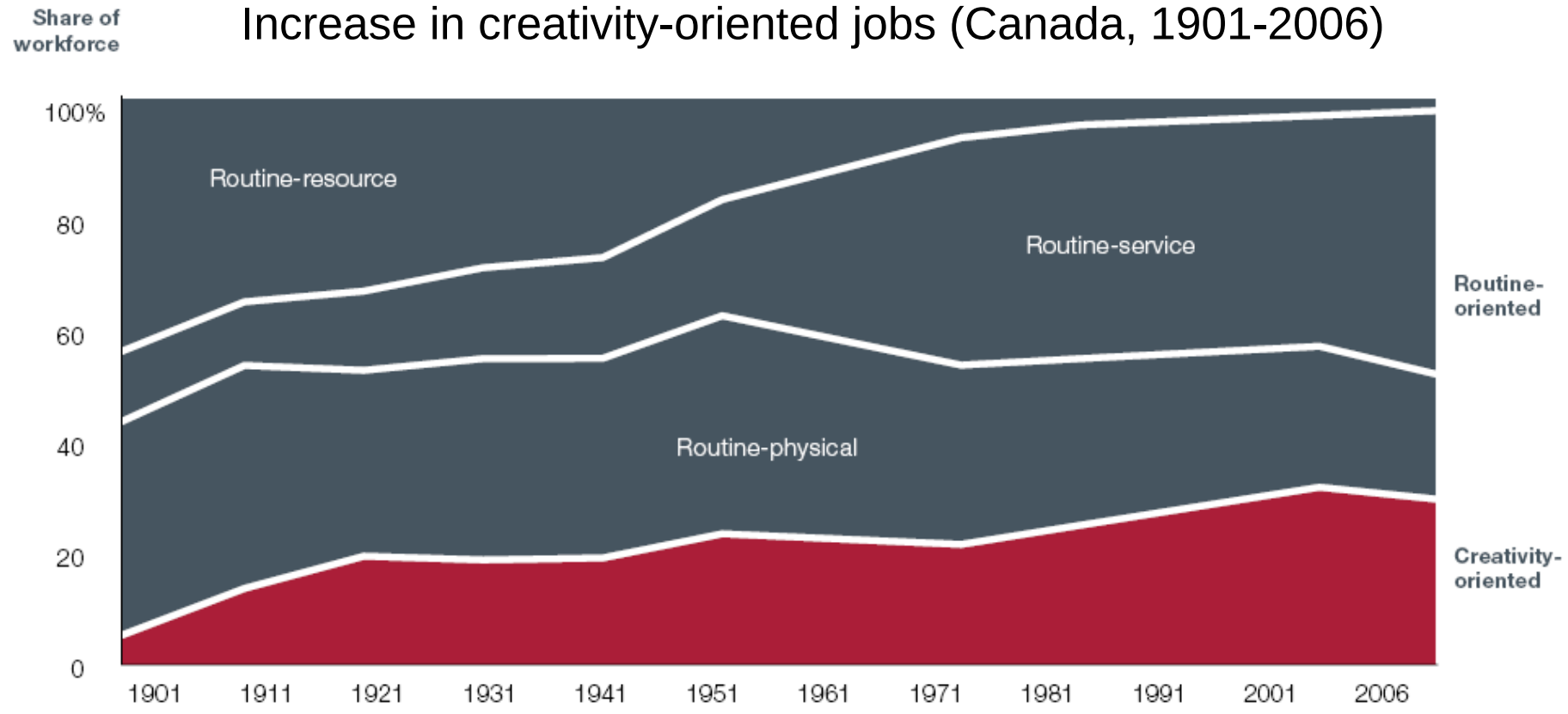
Economy-wide measures of routine and non-routine task input (US)



Source: Levy and Murnane, 2005

Changing skills demand

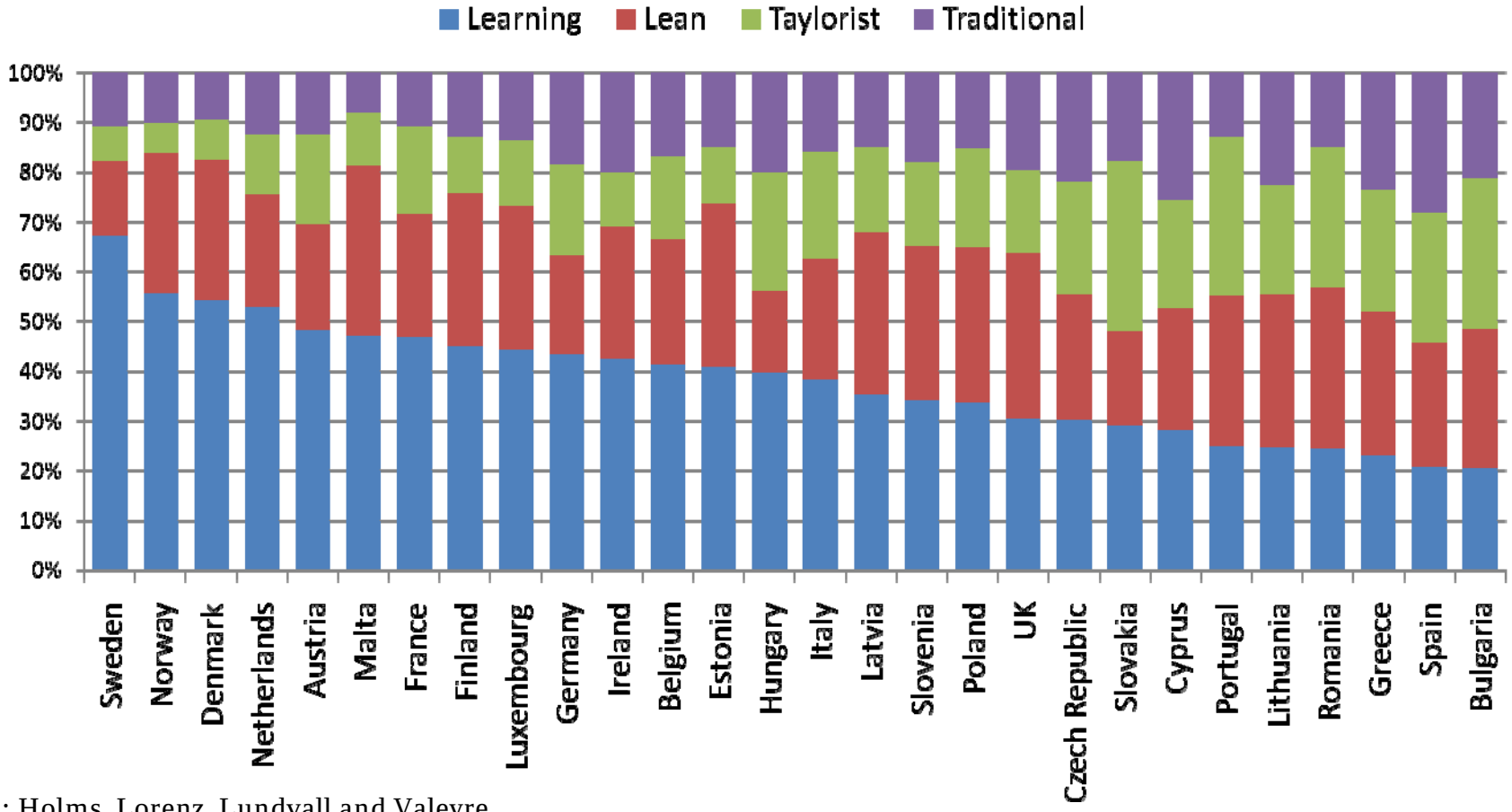
Increase in creativity-oriented jobs (Canada, 1901-2006)



Note: The 1961 and 1991 data points have been approximated due to data limitations.
Source: Martin Prosperity Institute analysis based on data from Statistics Canada.

Use of skills matters for innovation

Distribution of employees across organisation classes (2005)



Source: Holms, Lorenz, Lundvall and Valeyre

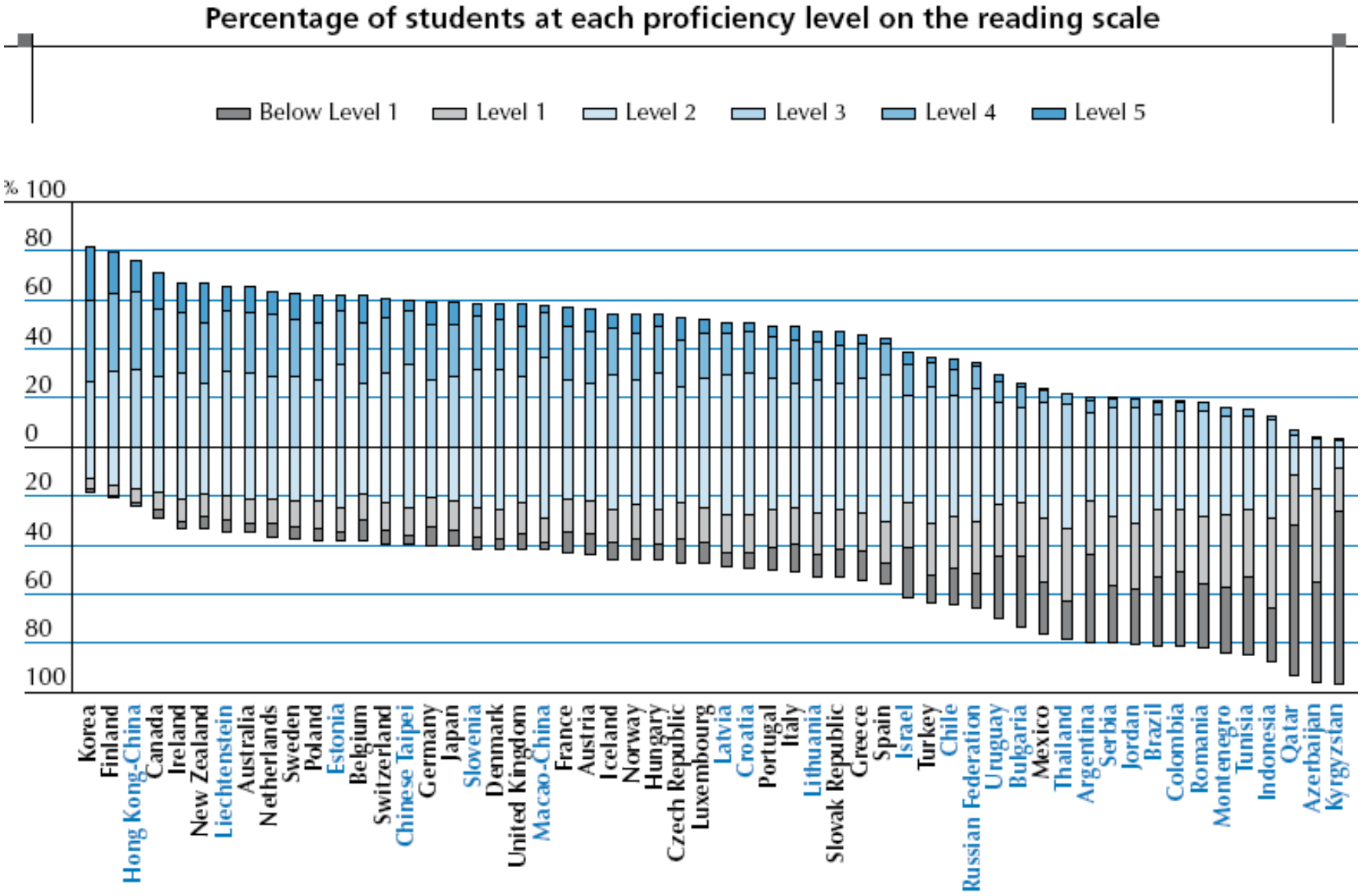
21st Century Skills

Ways of thinking	•Creativity and innovation •Critical thinking, problem solving •Learning to learn, meta-cognition
Ways of working	•Communication •Collaboration (teamwork)
Tools of working	•Information literacy •ICT literacy
Living in the world	•Citizenship – local and global •Life and career •Personal, social responsibility

Source: Microsoft-Intel-Cisco *ATC21S* project

Sufficient basic skills needed

- A good basic skills level in the population is necessary
  - To work in an innovative economy
  - To access and process information in a knowledge-intensive society
  - To contribute to innovation
  - To embark on lifelong learning
- Still too many young people and adults lack foundation skills


Percentage of students at each proficiency level on the reading scale
Below Level 1
Level 1
Level 2
Level 3
Level 4
Level 5
% 100
80
60
40
20
0
20
40
60
80
100
Korea
Finland
Hong Kong-China
Canada
Ireland
New Zealand
Liechtenstein
Australia
Netherlands
Sweden
Poland
Estonia
Belgium
Switzerland
Chinese Taipei
Germany
Japan
Slovenia
Denmark
United Kingdom
Macao-China
France
Austria
Iceland
Norway
Hungary
Czech Republic
Luxembourg
Latvia
Croatia
Portugal
Italy
Lithuania
Slovak Republic
Greece
Spain
Israel
Turkey
Chile
Russian Federation
Uruguay
Bulgaria
Mexico
Thailand
Argentina
Serbia
Jordan
Brazil
Colombia
Romania
Montenegro
Tunisia
Indonesia
Qatar
Azerbaijan
Kyrgyzstan

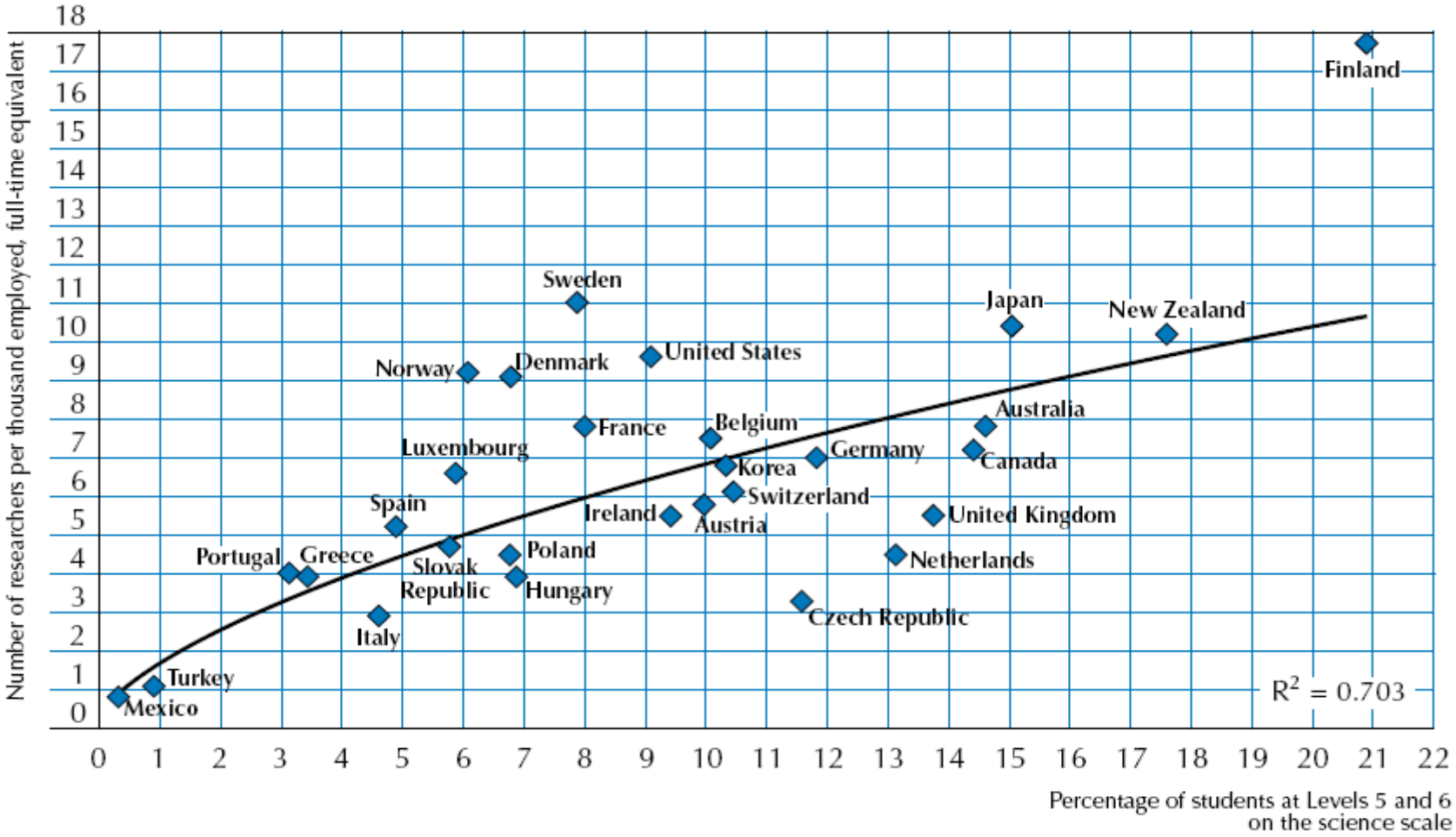
But also top performers matter

- In PISA 2006 share of top performers (reaching level 5 and above) in OECD average:
  - Science: 9%
  - Mathematics: 13.6%
  - Reading: 8.6%
- But with huge variations between countries
  - Nearly half of the OECD countries have less than 5% top performers in science
  - Four countries have 15% or more
- Slight tendency of decrease: -1% top performers in reading between 2000 and 2006 in OECD

Figure 1.3

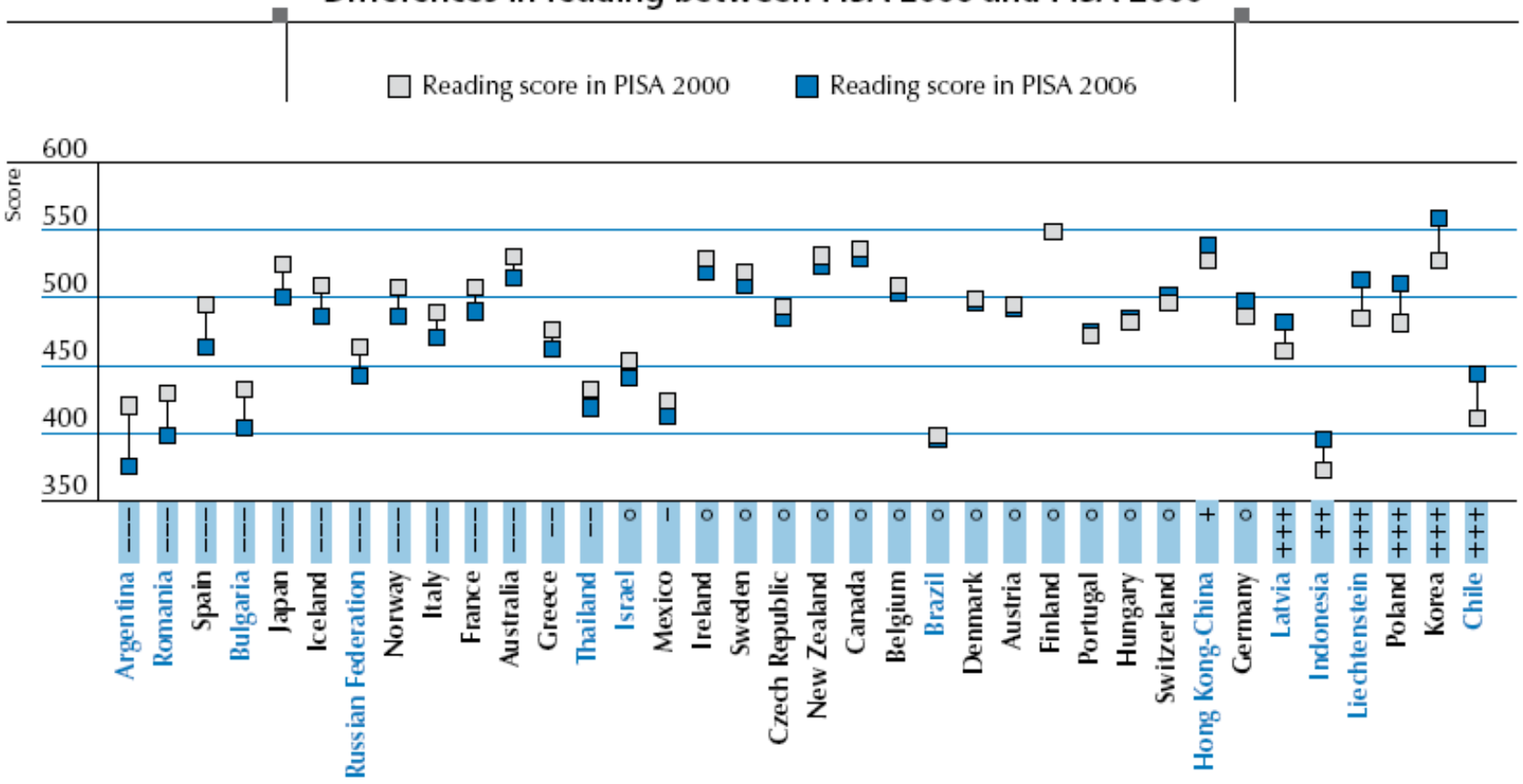
Science top performers in PISA and countries' research intensity

Top performers in the PISA science assessment and countries' research intensity



Source: *OECD Main Science and Technology Indicators 2006*, OECD, Paris. Table 2.1a.

Figure 6.9
Differences in reading between PISA 2006 and PISA 2000



	2006 higher than 2000	2000 higher than 2006	No statistically significant difference
90 % confidence level	+	–	o
95 % confidence level	++	– –	
99 % confidence level	+++	– – –	

Is education delivering?

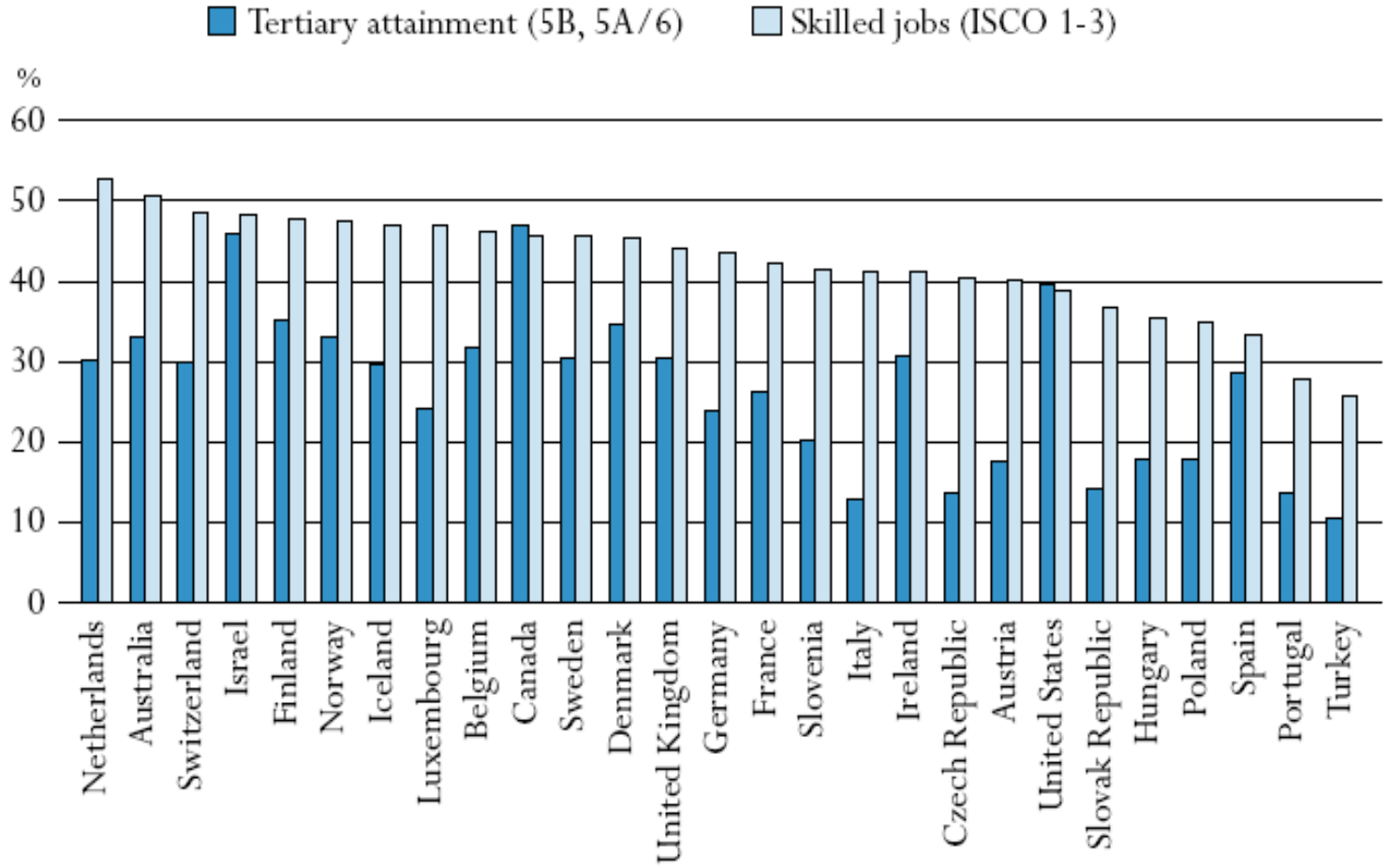
- In view of the current and future challenges education and training systems are not doing a very good job
  - Effectiveness could be much higher
  - Inequity of opportunities and outcomes remains striking
  - Educational innovation remains at a low level

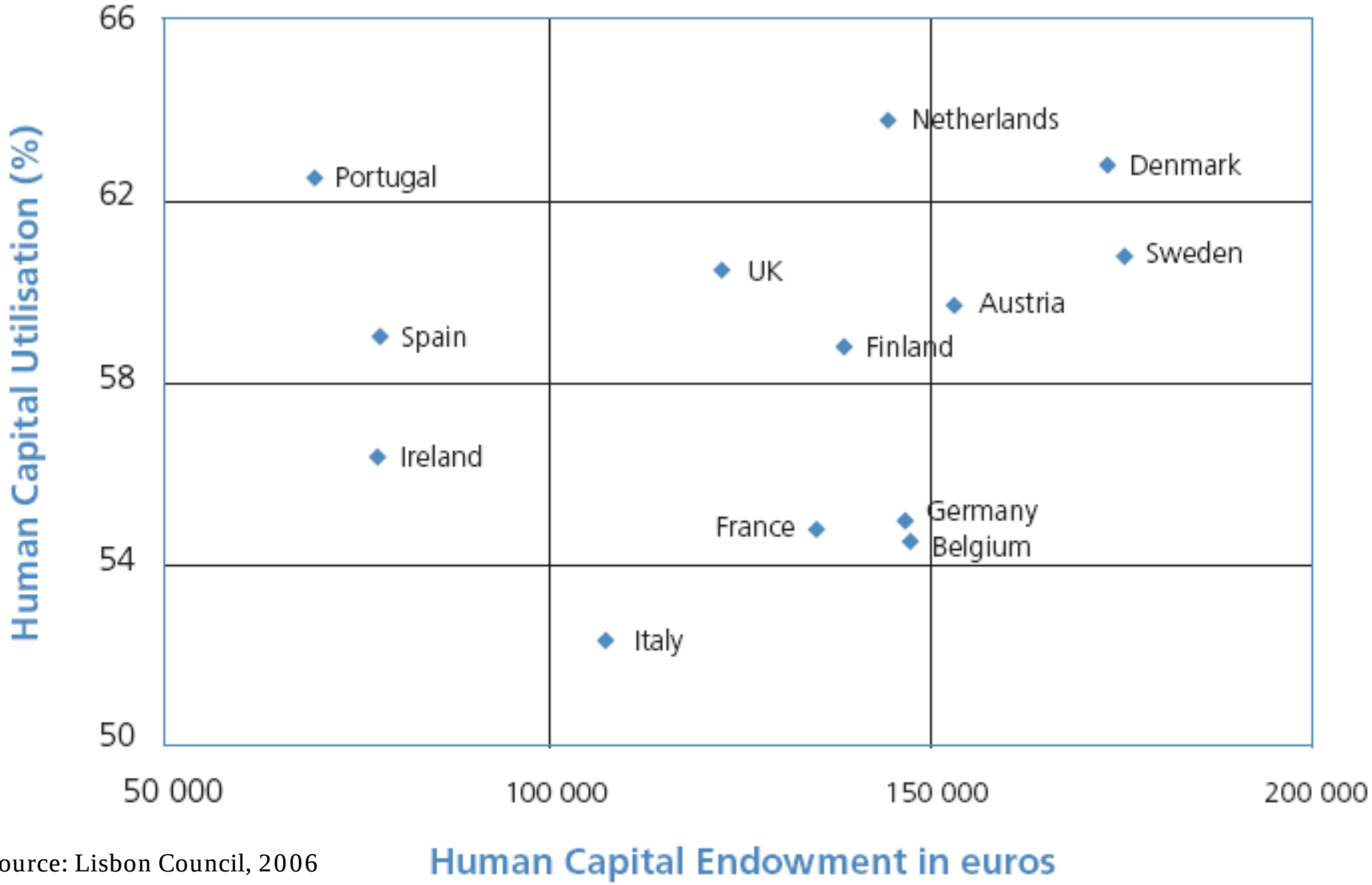
Education & training policies

- Raising the educational attainment level remains a crucial policy objective...
  - Economic return remains high to very high in most countries, both for individuals and societies
  - Very high non-economic benefits on health, political participation, social cohesion etc.
  - More equitable distribution of educational opportunities and success remains imperative
  - Increasing private demand because of the crisis because of lower opportunity costs

Chart A1.1. Proportion of population in skilled jobs and proportion of population with tertiary education (2006)

The chart depicts the proportion of the 25-to-64-year-old working population in skilled jobs and the proportion of the 25-to-64-year-old population with tertiary education (2006).

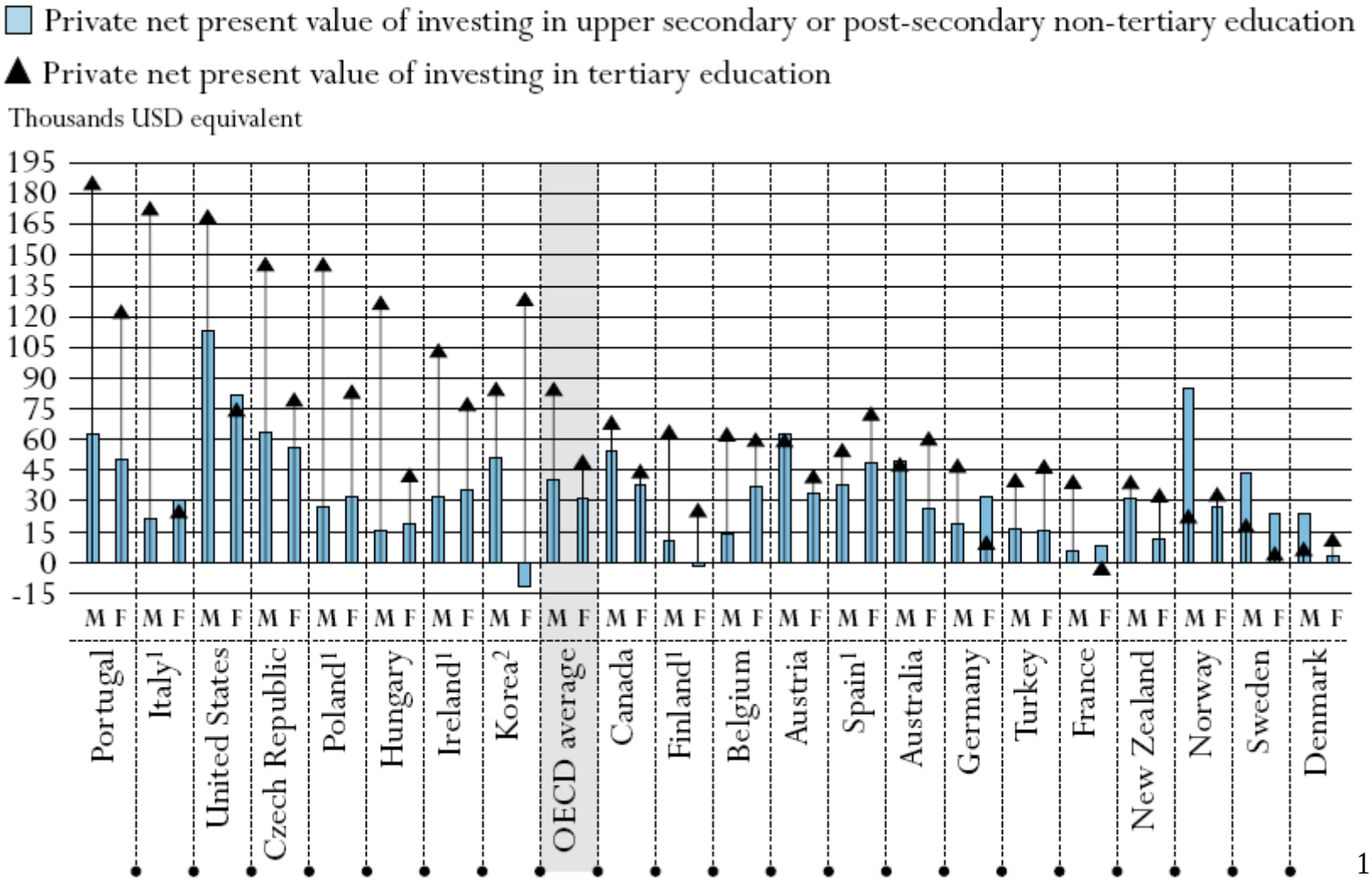




Source: Lisbon Council, 2006

Chart A8.1. Economic returns for an individual obtaining upper secondary or post-secondary non-tertiary education, ISCED 3/4, and for an individual obtaining tertiary education, ISCED 5/6, as part of initial education (2005)

The chart shows the net present value of investments in education discounted at a 5% interest rate.



Education & training policies

- ...but more of the same will not be enough; qualitative change and innovation is needed in education and training systems
- We may have to consider a real change of educational paradigm to make our education and training systems more effective and innovative
  - From 'the pedagogy of failure' to the 'pedagogy of success'

Old (or not so old) paradigm

- *Selection of the gifted*
  - 'Only small minority has the necessary abilities'
    - The impact of education is ceiled by the limited availability of innate abilities
    - Distribution of innate abilities follows normal distribution, so learning outcomes have to be distributed in the same way
  - Early tracking and streaming to select the best
  - Concentration of educational efforts and resources in elite institutions for the few
  - 'Pedagogy of failure' for the many

Contemporary paradigm

- *No more failure*
  - Equity and effectiveness: all students should leave school with necessary skills; achieving (minimum) standards becomes imperative for students and schools
  - Standardisation to increase effectiveness
    - Stricter control over curricula
    - Standardised assessment of learning outcomes
    - Sanctions for failing schools
  - Limiting impact of socio-economic background

Future paradigm

- *All talents to the highest possible level*
  - Excellence is not contradictory to equity
    - Some countries are capable of raising achievement at both ends of the performance scale or even to enhance excellence while decreasing inequity
  - Effective learning demands pedagogical differentiation and less standardisation
  - Less prescription but ensuring conditions to transform every school in effective school
  - 'Pedagogy of success' for all!

Questions

- What kind of teaching & learning arrangements do we need for the future?
  - How are the 21st C skills acquired by students?
  - What kind of curricula (explicitly or implicitly addressing these skills)?
  - What kind of pedagogies, teaching behaviour, learning behaviour, …?
  - What kind of learning environments, meeting new insights from the learning sciences?
  - What kind of assessment systems?

Muchas Gracias!

www.oecd.org/edu/ceri

www.oecd.org/edu/innovation