Falling into the Middle-Income Trap? A Study on the Risks for EU Regions to be Caught in a Middle-Income Trap

Final Report
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Falling into the Middle-Income Trap? A Study on the Risks for EU Regions to be Caught in a Middle-Income Trap

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Overview

This Report introduces and measures the concept of the **regional development trap** for the case of the European Union (EU).[1] The concept of regional development trap is deployed to identify EU regions that have lost their competitive edge and hence face significant structural challenges in retrieving past dynamism or just improving prosperity for their residents.

The Report develops a definition of regional development trap derived from the theory of the **middle-income trap**. This concept has, until now, been applied at a national economy level in emerging countries. It proposes measures to identify those EU regions that can be considered to be in a development trap or at significant near-term risk of falling into such a trap.

These measures are constructed by evaluating the economic, productivity, and employment performance of every region in the EU relative to itself in the immediate past, compared to other regions in the country where it is located and to other regions in the EU.

The development trap indicators generate the first detailed and dynamic picture of the phenomenon of development traps in the EU at a regional level.

The Report also uncovers the key factors that determine why regions fall into development traps and the obstacles that trapped regions face in attempting to fulfil their economic potential and escape the trap.

Finally, having a growing number of regions facing development traps generate economic, social, and political risks for individual regions and the EU as a whole. The report highlights these risks.

What is a development trap?

The concept of a development trap at a regional level in the EU is derived from the theoretical notion of the middle-income trap. This notion has been used to interpret why certain countries that had successfully transitioned from low- to middle-income status subsequently experience a durable decline in economic growth and as a result struggle, often for a long time, to move up to a higher income level. This concept has been mainly applied to emerging country economies at a national level. There is strong evidence that some countries undergo a considerable slowdown in economic growth after reaching levels of GDP per capita of between USD 10,000 and 11,000 and/or USD 15,000 and 16,000.

The middle-income trap concept has been rarely used at subnational level and even less in developed countries. There are three fundamental reasons for this. First, GDP per capita in developed countries is considerably higher than that described in the literature for countries stuck in a middle-income trap. Second, lack of economic dynamism and stagnation in many developed areas of the world does not exclusively manifest itself in terms of GDP per capita. It more often involves lack of productivity and/or employment growth or decline in innovation capacity. Third, stagnation in the developed world does not generally take place immediately after a process of transition from low- to middle-income, but seems to take a variety of forms, ranging

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[1] Throughout the report, the term 'EU' is used to refer to the EU28, including the UK, and the expression 'European Regions' to denote all regions in the EU28.

from long-term economic decline in income level relative to other regions or to lengthy periods of subpar economic performance at middle-income levels, or to never becoming a high-income region.

The development trap in the EU

Over the last few decades, it has become increasingly clear that in developed countries – and particularly in parts of the EU – many regions have faced problems of lack of economic progress and dynamism, akin to those that have been described for certain middle-income countries. This is generating a Europe at different speeds. In particular, economic performance at the very top and the very bottom of the income scale has been far more dynamic than that achieved by many regions in-between these two extremes. This is manifest specifically by considerable number of EU regions that experience lengthy periods of low growth, weak productivity increases, low employment creation or even loss. This phenomenon includes some formerly wealthy areas of the EU, pushing some of them into the ranks of the middle-income EU areas.

Many of the features of these regions are in many ways comparable to those of middle-income economies: their cost base is too high to compete in basic goods production and in service provision with less advanced regions in the EU and with low-to lower-middle income countries, while their skills endowment and capacity to innovate are too weak to compete with the most advanced EU regions for other types of activity. Their competitiveness and dynamism are also undermined by such factors as international outsourcing, offshoring, low inward investment, and a limited capacity to encourage and support the internationalization of domestic firms.

In sum, a considerable number of regions in the EU have shown signs of being in an acute development trap, although in most cases at significantly higher per capita income levels than those that have been described for middle-income trapped countries.

The travails of these regions have become more and more evident. From a policy perspective, however, their troubles remain somewhat under the radar, caught between national policies that often target the wealthiest and most dynamic places within their countries and an EU Cohesion policy aimed at strengthening the economic, social, and territorial cohesion by investing in the least developed regions. The Seventh Report on Economic, Social and Territorial Cohesion did document the emergence of subnational economic development clubs, pointing the way to the present more detailed analysis of regional development traps. Therefore, this Report identifies the factors behind this phenomenon, with the goal of raising the awareness of it and the need for innovative policies to help regions spring the trap.

Measuring the regional development trap in the EU

The first aim of the Report is to translate the middle-income trap concept into measures of which regions in the EU have been development trapped or at risk of becoming trapped in recent years. The Report offers an intuitive and dynamic conceptualisation – rather than just a snapshot – of what constitutes a development trap at a regional level in the EU. This provides decision-makers with a comprehensive tool to appraise the extent to which a region has been or is at risk of being trapped on a year-by-year basis.

The development trap measures are based on three dimensions of the economic dynamism of a territory: GDP per capita, productivity, and level of employment. It looks at how a region performs across the three dimensions, relative to its past, to its own country and to the EU average. Finally, combines the finding into one summary indicator of average risk or severity/intensity of being trapped.

Figure ES1 presents the average regional risk of being trapped for the period between 2001 and 2015, with the different shading highlighting the average regional risk scores in quartiles. Darker shading represents higher risk.

Figure ES1: Average risk of being trapped in the EU, quartiles of the distribution over 2001-2015
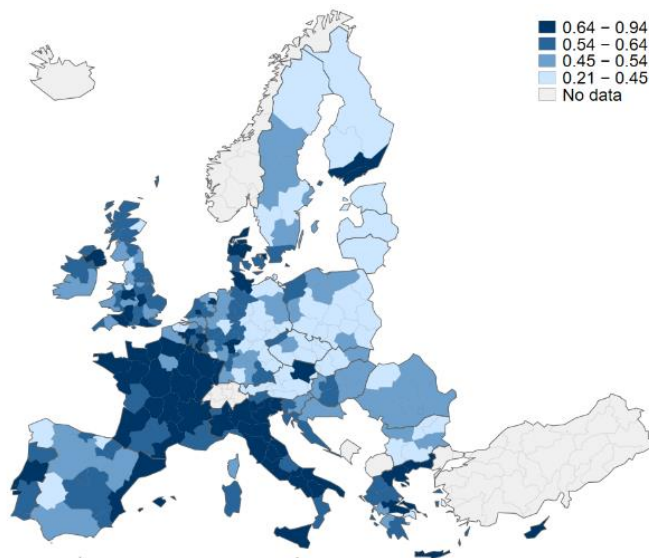
Many rural and old industrial regions, mostly in Western Europe, have endured long periods of entrapment or are at significant risk of being trapped. This is the case, for example, of old industrial regions in Central and North Eastern France, Northern Italy, parts of Wallonia in Belgium, Northern Jutland in Denmark, Eastern Spain, or the English Midlands. Other traditionally well-off regions, such as Lower Austria, South Sweden, or Southern Finland also belong in this category. In addition, a number of low income and low growth regions in Southern Italy and Greece – most of them in the less developed European Cohesion Policy category – are in this group.

The standard middle-income trap concept has been applied exclusively to middle-income countries in the world economy. The methodology of this Report generates one importantly different result for EU regions: it captures a tendency to stagnation or trapping at different income levels, not just middle-income areas. Indeed, EU regions with high income per capita are shown to have a greater risk of falling into a development trap, as do some regions among the ranks of the least developed.

Three types of trapped regions are identified according to their initial level of development:

a) **Regions trapped at high levels of income:** These are territories that, despite still being relatively well-off in terms of GDP per capita, have experienced long periods of subpar economic, productivity, and employment growth, often associated with the demise of industries that were their main source of wealth in the past. This group includes most regions in Central and North Eastern France, Northern and Central Italy, Northern Jutland in Denmark, South Sweden, Southern Finland, and Lower Austria. These regions have experienced significant relative economic decline, bringing many of them closer to middle-income levels in the EU.

b) **Regions trapped at middle-income levels**: These are regions that had achieved, by the late 1990s, levels of GDP per head that were between 75 and 100 percent of the EU average, but whose economic dynamism has since stagnated. As a consequence, they have struggled to improve their standing, often both in relative and in absolute terms. This group includes regions in the

Italian Mezzogiorno, areas of Greece close to Athens and Thessaloniki, Valencia and Murcia in Spain, but also regions that have been declining for a considerable amount of time in Wallonia (Belgium) and Northern England (UK).

c) **Regions trapped at low levels of income**: These are regions that, in contrast to most of the less developed regions in Europe receiving substantial investment from the Cohesion Policy, have struggled to sustain any type of economic dynamism at levels of GDP per capita below 75 percent of the EU average. Regions such as Calabria in Italy, East Macedonia and Thrace, West Greece, Thessaly, or Epirus in Greece, as well as regions in Central and Eastern Europe, such as Adriatic Croatia or Southern Transdanubia in Hungary, belong in this group.

What determines the likelihood of a region being trapped?

The reasons for falling into a development trap differ from one region to another. However, a number of common traits, concerning variations in economic and demographic structures, such as levels of value added in industry or population dependency ratios, human capital and innovation endowments, and institutional quality among regions, influence the probability of falling into a trap.

EU regions in a development trap tend to have lower shares of industrial GVA. The presence of a more competitive manufacturing sector helps regions become more resistant to development traps. By contrast, regions with a greater reliance on non-market services, have been more prone to stagnation and perform at a lower rate than in the past and/or their peers.

Development trapped regions also tend to have higher population dependency ratios and lower demographic dynamism. By contrast, higher manufacturing productivity, better endowments of human capital, such as a greater share of workers with secondary and tertiary education, and higher levels of support for science and technology help to shield regions from falling into a development trap. In particular, in regions where governments invest more in R&D the risk of being trapped is lower, as is also the case in those with a higher share of adult population with secondary and tertiary education.

Local government quality is an additional factor that affects the chances of being trapped. Regions with a better government quality and more auspicious institutional environments fare better than those with low government efficiency, limited transparency and accountability, or higher corruption.

Overall, sectoral structure, dependency ratios, and government quality significantly influence the risk of falling into a development trap, more so than innovation capacity and human capital endowments, factors which, nevertheless, remain essential for regional economic growth.

There are additional differences between the three different types of trapped regions. Structural factors and demographic structures are fundamental determining why some regions fall into development traps at low levels of income. In contrast, a better government quality, a higher skill level, and more government investment in R&D are crucial in reducing the likelihood of high-income regions of falling into a trap.

What determines the likelihood of a region coming out of a development trap?

The factors that reduce the likelihood of remaining trapped include the presence of a larger and more resilient manufacturing sector, higher government quality, higher human capital endowments, and higher shares in science and technology employment.

By contrast, regions with a greater reliance on non-market sectors are more likely to remain entrapped.

Once again, differences are observed between each group in what it takes to escape a trap. Chances of a low-income region springing out of a trap are improved by greater industrial productivity and more jobs in science and technology. For higher-income trapped regions, chances of getting out are improved by more R&D investment by the public sector, improvements in skills, and, above all, better government quality.

These results are confirmed by detailed case studies of four regions that have consistently scored high in both development trap indices: **Adriatic Croatia**, at low-income levels; **Abruzzo** (Italy) and **Champagne-Ardenne** (France), at middle-income; and **South Sweden**, at high-income. The case studies provided additional nuance and brought into the fore the diversity of factor combinations through which regions across the EU have fallen into and/or remain in development traps. They also highlighted that there is no one-size-fits-all solution to falling into or escaping a development trap.

The need for policies to end regional development traps

This Report demonstrates that regional development traps are a serious risk for the future of the EU. Springing these traps and thus liberating the untapped economic potential of the many struggling and stagnating regions in the EU would not only maximise GDP, productivity, and employment growth in many regions that have fallen or are falling behind, but would also represent a boost for the overall competitiveness of the EU as a whole. Regions that often were past motors of European economic development have not completely lost their edge overnight. Many of them possess valuable resources that can be mobilised. To allow them to continue to be trapped would represent a waste of resources and pose serious social and political risks for the stability of European countries, in general, and the EU as a whole.

This is not just an economic matter: remaining for long in a development trap is brewing an increasing geography of EU discontent. Subpar economic performances, lack of employment opportunities, and loss of competitiveness, due to low productivity levels, is causing social and political resentment towards what is increasingly regarded – justly or unjustly – as a system that does not benefit areas being left behind. Development traps are fuelling the perception that we are in front of a two tier Europe, polarised between a reduced number of dynamic and competitive super-regions, in which economic and political power blend, and ever-growing ranks of left behind places, increasingly perceived as not to matter or to matter much less than they once did.

Solving the development trap problem in the EU represents a challenge for Cohesion Policy, as well as for national public policies. Development traps can only be addressed by more efficient and better targeted interventions that go beyond the traditional concern with the less developed regions of the European Cohesion Policy and the dominating focus by national governments on policies aimed at improving competitiveness in the more dynamic regions. But regional development traps can take place in the EU at many different levels of development. Establishing such better, more integrated, and more balanced development policies to target the scores of regions that are being left behind in development traps will allow the EU to better combat regional inequalities and the threat of rising discontent within our midst.

ZUSAMMENFASSUNG

Überblick

In diesem Bericht wird das Konzept der **regionalen Entwicklungsfalle** im Kontext der Europäischen Union (EU) vorgestellt und bemessen.[2] Das Konzept der regionalen Entwicklungsfalle wird genutzt, um EU-Regionen zu identifizieren, die ihren Wettbewerbsvorteil verloren haben und daher vor erheblichen strukturellen Herausforderungen bezüglich der Wiederbelebung vergangener wirtschaftlicher Dynamiken und der Wohlstandsverbesserung ihrer Bewohner stehen.

Dieser Bericht entwickelt eine Definition der regionalen Entwicklungsfalle, die aus der Theorie der „**Falle des mittleren Einkommens**" abgeleitet ist. Dieses Konzept wurde bisher in Schwellenländern auf gesamtwirtschaftlicher Ebene angewendet. Der Bericht schlägt Mittel und Wege vor, EU-Regionen zu identifizieren, die sich in einer solchen Entwicklungsfalle befinden oder die einem erheblichen Risiko ausgesetzt sind, kurzfristig in eine solche Falle zu geraten.

Diese Mittel basieren auf einer Bewertung der Wirtschafts-, Produktivitäts- und Beschäftigungslage jeder Region in der EU, relativ zur unmittelbaren Vergangenheit selbiger Region sowie im Vergleich zu Regionen im selben Land und anderen EU Regionen.

Die Entwicklungsfallenindikatoren liefern erstmals ein detailliertes und dynamisches Bild des Phänomens der Entwicklungsfalle auf regionaler Ebene in der EU.

Dieser Bericht deckt die Schlüsselfaktoren auf, die bestimmen, warum Regionen in Entwicklungsfallen geraten, und beschreibt die Hindernisse, denen sich stagnierende Regionen gegenübersehen, wenn sie versuchen, ihr wirtschaftliches Potenzial auszuschöpfen und einer solchen Falle zu entkommen.

Die wachsende Anzahl von Regionen, die mit Entwicklungsfallen konfrontiert sind, birgt wirtschaftliche, soziale und politische Risiken für einzelne Regionen und die EU in ihrer Gesamtheit. Der Bericht hebt diese Risiken hervor.

Was ist eine Entwicklungsfalle?

Das Konzept der Entwicklungsfalle auf regionaler Ebene in der EU leitet sich aus dem theoretischen Begriff der „Falle des mittleren Einkommens" ab. Die Theorie der „Falle des mittleren Einkommens" wird verwendet, um zu erklären, warum bestimmte Länder, die den Übergang von niedrigem zu mittlerem Einkommen erfolgreich bewerkstelligt haben, später einen dauerhaften Rückgang des Wirtschaftswachstums verzeichnen und infolgedessen oft auch langfristig Schwierigkeiten haben, auf ein höheres Einkommensniveau aufzusteigen. Dieses Konzept wurde hauptsächlich auf nationaler Ebene für Volkswirtschaften von Schwellenländern angewendet. In diesen gibt es starke Hinweise darauf, dass einige Länder nach Erreichen eines Bruttoinlandsprodukts (BIP) pro Kopf von zwischen 10.000 und 11.000 USD und/oder zwischen 15.000 und 16.000 USD eine erhebliche Verlangsamung des Wirtschaftswachstums verzeichnen.

Die Theorie der „Falle des mittleren Einkommens" wurde selten auf subnationaler Ebene oder im Zusammenhang mit Industrieländern angewendet. Dafür gibt es drei Gründe. Erstens ist das BIP pro Kopf in Industrieländern erheblich höher als das in der

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Literatur beschriebene Einkommen von Ländern, die in die „Falle des mittleren Einkommens" geraten. Zweitens äußert sich der Mangel an wirtschaftlicher Dynamik und Stagnation in vielen entwickelten Gebieten der Welt nicht ausschließlich im BIP pro Kopf, sondern in mangelnder Produktivität, geringem Beschäftigungswachstum oder in einem Rückgang der Innovationsfähigkeit. Drittens findet die Stagnation in Industrieländern im Allgemeinen nicht unmittelbar nach einem Übergangsprozess von niedrigem zu mittlerem Einkommen statt, sondern scheint verschiedene Formen anzunehmen. Diese erstrecken sich über den langfristigen wirtschaftlichen Rückgang des Einkommensniveaus im Vergleich zu anderen Regionen, langen Perioden unterdurchschnittlicher Wirtschaftsleistung auf mittlerem Einkommensniveau bis dahin, dass bestimmte Regionen nie auf ein höheres Einkommensniveau aufsteigen.

Die Entwicklungsfalle in der EU

In den letzten Jahrzehnten wurde immer deutlicher, dass in Industrieländern - und insbesondere in Teilen der EU - viele Regionen mit Problemen mangelnden wirtschaftlichen Fortschritts und wirtschaftlicher Dynamik konfrontiert sind. Diese Probleme ähneln denen, die sonst in bestimmten Ländern mittleren Einkommens beobachtet wurden. Dies erzeugt ein Europa mit unterschiedlichen Geschwindigkeiten. Insbesondere die Wirtschaftsleistung ganz oben und ganz unten auf der Einkommensskala war weitaus dynamischer als die, die in vielen Regionen zwischen den Extremen erzielt wurde. Dies zeigt sich insbesondere in einer beträchtlichen Anzahl von EU-Regionen, die lange Zeiträume geringen Wachstums, schwacher Produktivitätssteigerung und geringer Schaffung - bis hin zum Abbau - von Arbeitsplätzen erleben. Das Phänomen umfasst einige ehemals wohlhabende Gebiete der EU, von denen sich nun einige in den Reihen der EU-Gebiete mittleren Einkommens wiederfinden.

Viele der volkswirtschaftlichen Merkmale dieser Regionen sind in vielerlei Hinsicht mit denen der Länder mittleren Einkommens vergleichbar: Auf der einen Seite sind ihre Produktionskosten zu hoch, um bei der Produktion von Basisgütern und der Erbringung von Dienstleistungen mit weniger fortgeschrittenen EU-Regionen und Ländern niedrigen bis mittleren Einkommens im unteren Bereich zu konkurrieren. Auf der anderen Seite ist das durchschnittliche Qualifikationsniveau und die Innovationskapazität nicht ausreichend, um mit den am weitesten fortgeschrittenen EU-Regionen um andere Arten wirtschaftlicher Aktivität konkurrieren zu können. Die Wettbewerbsfähigkeit und Dynamik dieser Regionen werden auch durch Faktoren wie fehlendes internationales Outsourcing und Offshoring, geringe Auslandsinvestitionen und eine begrenzte Kapazität zur Förderung und Unterstützung der Internationalisierung inländischer Unternehmen negativ beeinträchtigt.

Insgesamt gibt es eine beträchtliche Anzahl von Regionen in der EU, die Anzeichen dafür zeigen, dass sie sich in einer akuten Entwicklungsfalle befinden, obwohl sie in den meisten Fällen ein signifikant höheres Pro-Kopf-Einkommen aufweisen als die Länder mittleren Einkommens, für die das Konzept ursprünglich entwickelt wurde.

Die Schwierigkeiten dieser Regionen werden immer offensichtlicher. Aus politischer Sicht bleiben ihre Probleme jedoch nicht ausreichend beachtet. Der Grund ist, dass sie zwischen nationale Politikmaßnahmen, die häufig auf die reichsten und dynamischsten Orte ihrer Länder abzielen, und einer EU-Kohäsionspolitik, die darauf abzielt, den wirtschaftlichen, sozialen und territorialen Zusammenhalt durch Investitionen in die am wenigsten entwickelten Regionen zu stärken, fallen. Der *Siebte Bericht über den wirtschaftlichen, sozialen und territorialen Zusammenhalt* dokumentiert die Entstehung von sogenannten „Regionenklubs", die sich nach wirtschaftlicher Entwicklung einteilen lassen. Der siebte Bericht legt das Fundament zur hier durchgeführten detaillierteren Analyse regionaler Entwicklungsfallen: In diesem Bericht werden Faktoren identifiziert, die hinter dem Phänomen der regionalen Entwicklungsfalle stehen. Das Ziel des Berichts ist es, das Bewusstsein für diese

Entwicklungsfallen zu schärfen und innovative Strategien zu entwickeln, die den betroffenen Regionen helfen, der Falle zu entkommen.

Messung regionaler Entwicklungsfallen in der EU

Das erste Ziel dieses Berichts besteht darin, das Konzept der „Falle des mittleren Einkommens" in messbare Einheiten zu übersetzen, die die Regionen der EU, welche in den letzten Jahren in der Entwicklung stagnierten oder in Gefahr sind zu stagnieren, auszeichnen. Der Bericht bietet eine intuitive und dynamische Konzeptualisierung - und nicht nur eine Momentaufnahme - dessen, was eine Entwicklungsfalle auf regionaler Ebene in der EU darstellt. Entscheidungsträger erhalten so ein umfassendes Instrument, um zu beurteilen, inwieweit eine Region von Jahr zu Jahr in Gefahr ist in einer Entwicklungsfalle zu stagnieren.

Die Bemessung der Entwicklungsfalle basiert auf drei Dimensionen der wirtschaftlichen Dynamik einer Region: Auf dem regionalen BIP pro Kopf, der regionalen Produktivität und dem regionalen Beschäftigungsniveau. Es wird untersucht, wie sich eine Region in den drei Dimensionen relativ zur unmittelbaren Vergangenheit selbiger Region, sowie im Vergleich zu Regionen im selben Land und anderen EU Regionen entwickelt. Schließlich wird aus den Variablen ein zusammenfassender Indikator für das durchschnittliche Risiko bzw. den Schweregrad/der Intensität der Entwicklungsfalle erstellt.

Abbildung ZF1 zeigt das durchschnittliche regionale Risiko, für den Zeitraum zwischen 2001 und 2015 in einer Entwicklungsfalle zu stagnieren. Die unterschiedlichen Schattierungen kennzeichnen die durchschnittlichen regionalen Risikobewertungen, abgebildet in Quartilen. Eine dunklere Schattierung kennzeichnet ein höheres Risiko.

Abbildung ZF1: Durchschnittliches regionales Risiko in eine Entwicklungsfalle zu geraten, Quartile der Verteilung im Zeitraum 2001-2015 in der EU
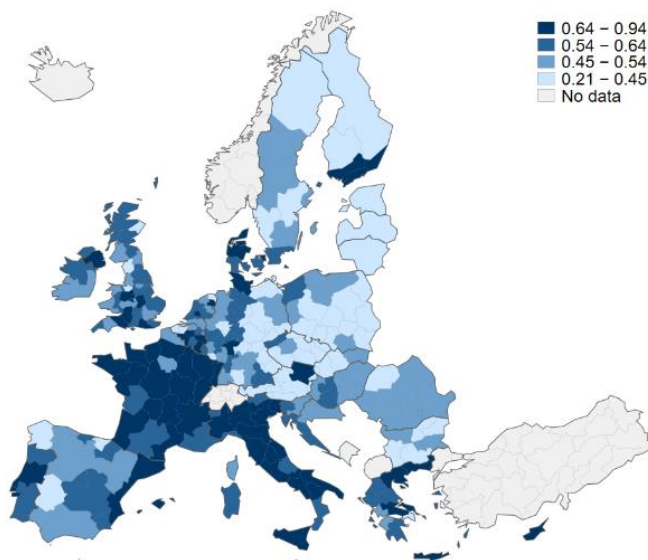
Viele ländliche und alte Industrieregionen, hauptsächlich in Westeuropa, haben lange Zeiträume der Stagnation durchgemacht oder sind einem erheblichen Risiko ausgesetzt, zu stagnieren. Beispiele hierfür sind alte Industrieregionen in Mittel- und Nordostfrankreich, Norditalien, Teile der Wallonie in Belgien, Nordjütland in Dänemark, Ostspanien und die englischen Midlands. Zu dieser Kategorie gehören auch andere traditionell wohlhabende Regionen wie Niederösterreich, Südschweden oder Südfinnland. Darüber hinaus gehören eine Reihe von Regionen mit niedrigem Einkommen und geringem Wachstum in Süditalien und Griechenland, von denen die

meisten der Kategorie der weniger entwickelten Regionen im Rahmen der Europäischen Kohäsionspolitik zugeordnet werden, zu dieser Gruppe.

Das Standardkonzept der Falle des mittleren Einkommen wurde bisher ausschließlich auf Länder mittleren Einkommens in der Weltwirtschaft angewendet. Die Methodik dieses Berichts führt zu einem wesentlich anderen Ergebnis für die Regionen der EU: Sie erfasst die Tendenz zur Stagnation auf unterschiedlichen Einkommensniveaus nicht nur in Gebieten mittleren Einkommens. In der Tat haben EU-Regionen mit hohem Pro-Kopf-Einkommen sowie einige Regionen unter den am wenigsten entwickelten ein höheres Risiko, in eine Entwicklungsfalle zu geraten.

Drei Arten von stagnierenden Regionen werden entsprechend ihres anfänglichen Entwicklungsstands klassifiziert:

a) **Stagnierende Regionen mit hohem Einkommen**: Dies sind Gebiete, die trotz ihres relativ hohen BIPs pro Kopf lange Zeiträume unterdurchschnittlichen Wirtschafts-, Produktivitäts- und Beschäftigungswachstums verzeichneten. Diese sind häufig mit dem Niedergang von Industrien verbunden, die in der Vergangenheit die Hauptquelle ihres Wohlstands darstellten. Diese Gruppe umfasst die meisten Regionen in Mittel- und Nordostfrankreich, Nord- und Mittelitalien, Nordjütland in Dänemark, Südschweden, Südfinnland und Niederösterreich. Regionen in dieser Gruppe verzeichneten über den erfassten Zeitraum einen erheblichen relativen wirtschaftlichen Rückgang, wodurch viele von ihnen näher an das Niveau des mittleren Einkommens innerhalb der EU heranrücken.

b) **Stagnierende Regionen mit mittlerem Einkommen**: Dies sind Regionen, die Ende der neunziger Jahre ein BIP pro Kopf zwischen 75 und 100 Prozent des EU-Durchschnitts erreicht hatten, dessen wirtschaftliche Dynamik seitdem jedoch stagnierten. Diese Regionen taten sich deshalb schwer, die eigene wirtschaftliche Stellung zu verbessern. Dies galt oftmals sowohl relativ als auch absolut. Diese Gruppe umfasst Regionen im italienischen Mezzogiorno, Gebiete in Griechenland in der Nähe von Athen und Thessaloniki, Valencia und Murcia in Spanien, sowie Regionen, die in Wallonien (Belgien) und Nordengland (UK) seit geraumer Zeit rückläufig sind.

c) **Stagnierende Regionen mit niedrigem Einkommen**: Dies sind Regionen, die im Gegensatz zu den meisten anderen weniger entwickelten Regionen in Europa, die erhebliche Investitionen aus der Kohäsionspolitik erhalten, Schwierigkeiten haben, irgendeine Art von wirtschaftlicher Dynamik bei einem BIP pro Kopf von 75 Prozent des EU-Durchschnitts aufrechtzuerhalten. Zu dieser Gruppe gehören Regionen wie Kalabrien in Italien, Ostmakedonien und Thrakien, Westgriechenland, Thessalien und Epirus in Griechenland, sowie Regionen in Mittel- und Osteuropa wie das Adriatische Kroatien oder Südtransdanubien in Ungarn.

Welche Faktoren bestimmen die Wahrscheinlichkeit, dass eine Region in eine Entwicklungsfalle gerät?

Die Gründe in eine Entwicklungsfalle zu geraten sind von Region zu Region verschieden. Eine Reihe gemeinsamer Merkmale, die auf Unterschieden in den wirtschaftlichen und demografischen Strukturen fußen, beeinflussen die Wahrscheinlichkeit einzelner Regionen zu stagnieren. Hierzu gehören die industrielle Wertschöpfung, der Abhängigenquotient der Bevölkerung, regionales Humankapital, Innovationskraft, sowie regionale Qualitätsunterschiede von Institutionen.

EU-Regionen in einer Entwicklungsfalle weisen tendenziell geringere Anteile an industrieller Bruttowertschöpfung auf. Das Vorhandensein eines wettbewerbsfähigen verarbeitenden Gewerbes hilft den Regionen, widerstandsfähiger gegenüber

Entwicklungsfallen zu werden. Im Gegensatz dazu sind Regionen mit einer stärkeren Abhängigkeit von nicht marktbestimmten Dienstleistungen anfälliger für Stagnation und schneiden schlechter ab als in der Vergangenheit und gegenüber ihrer Mitbewerber.

Stagnierende Regionen weisen tendenziell auch einen höheren Abhängigenquotient der Bevölkerung und eine geringere demografische Dynamik auf. Im Gegensatz dazu tragen eine höhere Produktivität im verarbeitenden Gewerbe, eine bessere Ausstattung mit Humankapital gemessen an einem größeren Anteil von Arbeitnehmern mit Sekundar- und Tertiärbildung, sowie ein höheres Maß an Unterstützung für Wissenschaft und Technologie dazu bei, Regionen davor zu schützen, in eine Entwicklungsfalle zu geraten. Insbesondere in Regionen, in denen Regierungen mehr in Forschung und Entwicklung investieren, ist das Risiko zu stagnieren geringer. Selbiges gilt für Regionen mit einem höheren Anteil von Sekundar- und Tertiärbildung in der volljährigen Bevölkerung.

Die Qualität lokaler Institutionen ist ein zusätzlicher Faktor, der die Wahrscheinlichkeit zu stagnieren beeinflusst. Regionen mit einer besseren Regierungsqualität und einem besseren institutionellen Umfeld schneiden besser ab als Regionen die durch geringere Regierungseffizienz, begrenzte Transparenz und Rechenschaftspflicht sowie von höherer Korruption gekennzeichnet sind.

Insgesamt spielen die Sektorstruktur, der Abhängigenquotient und die Regierungsqualität eine relativ wichtigere Rolle für das Risiko in eine Entwicklungsfalle zu geraten als die regionale Innovationsfähigkeit und die Humankapitalausstattung. Letztere sind jedoch für das regionale Wirtschaftswachstum nach wie vor von wesentlicher Bedeutung.

Es gibt zusätzliche Unterschiede zwischen den drei verschiedenen Arten von stagnierenden Regionen. Strukturelle Faktoren und demografische Strukturen sind von grundlegender Bedeutung für das Stagnieren einiger Regionen auf niedrigem Einkommensniveau in. Im Gegensatz dazu sind eine bessere Regierungsqualität, ein höheres Qualifikationsniveau und höhere staatliche Investitionen in Forschung und Entwicklung entscheidend, um die Wahrscheinlichkeit zu verringern, dass Regionen mit hohem Einkommen in eine Entwicklungsfalle geraten.

Was bestimmt die Wahrscheinlichkeit, dass eine Region aus einer Entwicklungsfalle entkommt?

Zu den Faktoren, die die Wahrscheinlichkeit verringern, in einer Entwicklungsfalle zu bleiben, gehören das Vorhandensein eines größeren und widerstandsfähigeren verarbeitenden Gewerbes, eine höhere Regierungsqualität, höhere Humankapitalausstattung und ein höherer Beschäftigungsanteil im Wissenschafts- und Technologiesektor. Im Gegensatz dazu neigen Regionen mit einer stärkeren Abhängigkeit von nicht marktbestimmten Sektoren eher dazu, zu stagnieren.

Wiederum zeigen sich deutliche Unterschiede zwischen den einzelnen Gruppen bezüglich der Erforderlichkeiten, um aus einer Entwicklungsfalle zu entkommen. Die Chancen, dass eine Region mit niedrigem Einkommen aus der Falle entkommt, werden durch eine höhere industrielle Produktivität und durch zusätzliche Arbeitsplätze im Wissenschafts- und Technologiesektor verbessert. In Regionen mit hohem Einkommen verbessern sich die Chancen der Stagnation entgegenzuwirken durch höhere Investitionen in Forschung und Entwicklung durch den öffentlichen Sektor, einer Verbesserungen des regionalen Qualifikationsniveaus und insbesondere durch eine bessere Qualität der Regierung.

Die genannten Ergebnisse werden durch detaillierte Fallstudien von vier Regionen bestätigt, die in beiden Entwicklungsfallenindizes konstant hohe Punktzahlen aufzeigen: Das **Adriatische Kroatien,** welches auf niedrigem Einkommensniveau

stagniert; Die **Abruzzen** (Italien) und **Champagne-Ardenne** (Frankreich), die auf mittlerem Einkommensniveau stagnieren; und **Südschweden**, welches auf hohem Einkommensniveau stagniert. Die Fallstudien liefern zusätzliche Details und betonen die Vielfalt der Faktorenkombinationen, durch die Regionen in der EU in Entwicklungsfallen geraten sind und/oder in diesen weiterhin stagnieren. Die Fallstudien zeigen auch, dass es keine einheitliche Lösung gibt, die vermeidet dass Regionen in eine Entwicklungsfalle geraten oder die dafür sorgt, dass sie dieser entkommen.

Die Notwendigkeit einer Politik zur Beendigung der regionalen Entwicklungsfallen

Dieser Bericht zeigt, dass regionale Entwicklungsfallen ein ernstes Risiko für die Zukunft der EU darstellen. Den Fallen zu entkommen und damit ungenutztes wirtschaftliches Potenzial in vielen von Schwierigkeiten gezeichneten stagnierenden Regionen der EU freizusetzen, würde nicht nur das BIP, die Produktivität und das Beschäftigungswachstum in vielen Regionen, die zurückgefallen sind oder zurückfallen, maximieren, sondern auch für einen Schub für die allgemeine Wettbewerbsfähigkeit der EU als Ganze sorgen. Regionen, die oftmals Antrieb des europäischen wirtschaftlichen Fortschritts waren, haben nicht über Nacht ihren Vorsprung eingebüßt. Viele von ihnen besitzen wertvolle Ressourcen, die mobilisiert werden können. Es wäre eine Verschwendung dieser Ressourcen und könnte ernsthafte soziale und politische Risiken für die Stabilität der europäischen Länder im Allgemeinen und der EU als Ganze mit sich bringen, wenn diese Regionen weiterhin stagnieren würden.

Dies hätte nicht ausschließlich wirtschaftliche Konsequenzen: Langfristig in Entwicklungsfallen zu stagnieren sorgt für eine zunehmende, lokale Unzufriedenheit in der EU. Unterdurchschnittliche Wirtschaftsleistung, mangelnde Beschäftigungsmöglichkeiten und ein Verlust der Wettbewerbsfähigkeit aufgrund geringer Produktivität führen zu sozialen und politischen Ressentiments gegenüber einem System, welches - zu Recht oder zu Unrecht – als eines wahrgenommen wird, welches zurückgelassenen Regionen unzureichend unterstützt.

Entwicklungsfallen beflügeln die Wahrnehmung, dass wir uns in einem zweigliedrigen Europa befinden, welches zwischen einer kleinen Anzahl dynamischer und wettbewerbsfähiger Superregionen, in denen sich wirtschaftliche und politische Macht vermischen, und einer ständig wachsenden Zahl von zurückgebliebenen Orten, die zunehmend als weniger wichtig wahrgenommen werden, unterscheidet.

Lösungen für das Problem regionaler Entwicklungsfallen zu finden, stellt eine Herausforderung für die EU-Kohäsionspolitik, sowie für nationale Politik da. Entwicklungsfallen können nur durch effizientere und gezieltere Interventionen bekämpft werden. Diese müssen über den traditionellen Schwerpunkt der Europäischen Kohäsionspolitik auf weniger entwickelte Regionen und den Fokus nationaler Regierungen auf Maßnahmen zur Verbesserung der Wettbewerbsfähigkeit dynamischerer Regionen hinausgehen. Regionale Entwicklungsfallen entstehen in der EU auf vielen verschiedenen Entwicklungsstufen. Durch die Gestaltung einer besseren, stärker integrierten und ausgewogeneren Entwicklungspolitik, die auf die zahlreichen Regionen abzielt, die in Entwicklungsfallen stagnieren, kann die EU regionale Ungleichheiten und die Gefahr einer zunehmenden Unzufriedenheit in unserer Mitte besser bekämpfen.

RESUME

Présentation

Ce rapport présente et évalue le concept de **piège du développement régional** pour le cas de l'Union européenne (UE)[3]. Le concept de piège du développement régional est déployé pour identifier les régions de l'UE qui ont perdu leur avantage concurrentiel et, par conséquent, font face à des défis structurels importants pour retrouver le dynamisme passé ou simplement améliorer la prospérité de ses résidents.

Ce rapport élabore une définition de piège du développement régional issue de la théorie du piège du revenu intermédiaire. Ce concept était appliqué, jusqu'à présent, au niveau de l'économie nationale des pays émergents. Il propose des mesures pour identifier les régions de l'UE pouvant être considérées comme étant dans un piège du développement ou dans un risque important d'y tomber à court terme.

Ces mesures sont construites en évaluant la performance économique, la productivité et l'emploi dans chaque région de l'UE par rapport à ses mêmes performances dans le passé immédiat, en comparant avec d'autres régions du pays concerné et d'autres régions de l'UE.

Les indicateurs de piège du développement fournissent le premier portrait détaillé et dynamique du phénomène des pièges du développement dans l'UE au niveau régional.

Le rapport met également en lumière les facteurs clés qui déterminent les raisons pour lesquelles les régions tombent dans des pièges du développement, ainsi que les obstacles rencontrés par les régions prises au piège au moment d'en sortir et de réaliser leur potentiel économique.

Enfin, le fait d'avoir un nombre croissant des régions rencontrant des pièges du développement génère des risques économiques, sociaux et politiques pour ces différentes régions et pour l'UE dans son ensemble. Le rapport souligne ces risques.

Qu'est-ce qu'un piège du développement ?

Le concept de piège du développement au niveau régional dans l'UE provient de la notion théorique de piège du revenu intermédiaire. Cette notion a été utilisée pour comprendre les raisons pour lesquelles certains pays ayant réussi leur transition du statut de faible-revenu à celui de revenu intermédiaire connaissaient par la suite un déclin durable de leur croissance économique et, par conséquent, rencontraient des difficultés, souvent pendant longtemps, à atteindre un niveau de revenu supérieur. Ce concept a été principalement appliqué aux économies des pays émergents, au niveau national. Beaucoup d'éléments montrent que certains pays connaissent un ralentissement considérable après avoir atteint des niveaux de PIB par habitant se situant entre 10 000 $ et 11 000 $ et/ou entre 15 000 $ et 16 000 $.

Le concept de piège du revenu intermédiaire a été rarement utilisé au niveau infranational, et encore moins dans les pays développés. Cela s'explique par trois raisons fondamentales. Premièrement, le PIB par habitant dans les pays développés est considérablement plus élevé que ce qui est décrit dans la littérature académique pour les pays pris au piège du revenu intermédiaire. Deuxièmement, le manque de dynamisme économique et la stagnation dans de nombreuses zones développées du monde ne se manifeste pas exclusivement par le PIB par habitant. Plus souvent, cela

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[3] Tout au long du rapport, le terme « UE » est utilisé pour faire référence à l'UE à 28, incluant le Royaume-Uni, et l'expressions « régions européennes » pour définir toutes les régions de l'UE à 28.

implique le manque de productivité et/ou la croissance de l'emploi ou le déclin de la capacité d'innovation. Troisièmement, la stagnation dans le monde développé n'arrive généralement pas immédiatement après un processus de transition d'un revenu faible à intermédiaire, mais semble prendre des formes diverses : un déclin économique de long-terme du niveau de revenu par rapport à d'autres régions, des périodes prolongées de performance économique inférieure à la normale à des niveaux de revenus intermédiaires, ou le fait de ne jamais devenir une région à revenu élevé.

Le piège du développement dans l'UE

Au cours des dernières décennies, il est apparu de plus en plus évident que dans les pays développés – et particulièrement dans certaines parties de l'UE – de nombreuses régions ont rencontré des problèmes liés au manque de progrès et de dynamisme économique, semblable à ce qui a été décrit pour certains pays à revenu intermédiaire. Cela contribue à produire une Europe à plusieurs vitesses. En particulier, la performance économique au plus haut et au plus bas de l'échelle des revenus a été beaucoup plus dynamique que celle des nombreuses régions se situant entre ces deux extrêmes. Cela se manifeste plus spécifiquement par le nombre considérable de régions européennes qui connaissent des périodes prolongées de croissance réduite, de faible augmentation de la productivité et de la création d'emploi ou même de perte d'emplois. Ce phénomène concerne certaines régions de l'UE anciennement prospères, amenant certaines d'entre elles à rejoindre les rangs des zones à revenu intermédiaires de l'UE.

Par de nombreux aspects, beaucoup de caractéristiques de ces régions sont comparables à celles des économies à revenu intermédiaire : leur base de coûts est trop élevée pour concurrencer les régions moins avancées de l'UE et les pays à faible revenu et revenu moyen-inférieur sur la production de biens basiques et la prestation de services, tandis que le niveau de compétences et la capacité d'innovation sont trop faibles pour concurrencer les régions de l'UE les plus avancées sur d'autres d'activités. Leur compétitivité et leur dynamisme souffrent aussi de facteurs tels que l'externalisation, la délocalisation, de faibles investissements étrangers et une capacité limitée à encourager et soutenir l'internationalisation des entreprises locales.

En somme, un nombre considérable de régions de l'UE ont montré les signes d'un piège sérieux du développement, bien que ce soit, dans la plupart des cas, à des niveaux de revenus par habitant significativement supérieurs à ceux décrits pour les pays pris dans le piège du revenu intermédiaire.

Les difficultés de ces régions sont apparues de plus en plus manifestes. Toutefois, d'un point de vue des politiques, leurs problèmes demeurent quelque peu hors de la ligne de mire, avec, d'un côté, des politiques nationales qui ciblent souvent les lieux les plus riches et dynamiques au sein de leur pays et, de l'autre côté, une politique de cohésion de l'UE qui vise à renforcer la cohésion économique, sociale et territoriale en investissant dans les régions les moins développées. Le septième rapport sur la cohésion économique, sociale et territoriale a documenté l'émergence de « groupes de développement économique » infranationaux, traçant la voie pour la présente analyse, plus détaillée, des pièges du développement régional. Ainsi, ce rapport identifie les facteurs à l'origine de ce phénomène, avec l'objectif favoriser sa visibilité et de sensibiliser au besoin de politiques innovantes afin d'aider les régions concernées à sortir du piège.

## Mesurer le piège du développement régional dans l'UE

Le premier objectif de ce rapport est d'appliquer le concept de piège du revenu intermédiaire pour évaluer quelles régions de l'UE, ces dernières années, ont été prises dans un piège du développement ou sont à risque de l'être. Le rapport propose une conceptualisation intuitive et dynamique – plutôt qu'un simple aperçu – de ce qui

constitue un piège du développement au niveau régional dans l'UE. Cela fournit un outil complet aux décideurs pour évaluer la mesure dans laquelle une région a été ou est exposée au risque d'être piégée, sur une base annuelle.

Les mesures de piège du développement sont basées sur trois dimensions du dynamisme économique d'un territoire : le PIB par habitant, la productivité et le niveau d'emploi. La performance d'une région est examinée dans ces trois dimensions, en la comparant à son passé, au pays dans lequel elle est située et à la moyenne de l'UE. Enfin, les résultats sont combinés dans un indicateur synthétique du risque moyen ou de la gravité/l'intensité du risque d'être pris au piège.

La Figure ES1 ci-dessous présente le risque régional moyen d'être piégé pour la période 2001-2015 et les différentes nuances de couleur mettent en relief les scores de risque régional moyen en quartiles. Une nuance plus sombre représente un risque plus élevé.

Figure RE1: Risque moyen d'être pris au piège dans l'UE, quartiles de distribution sur la période 2011-2015
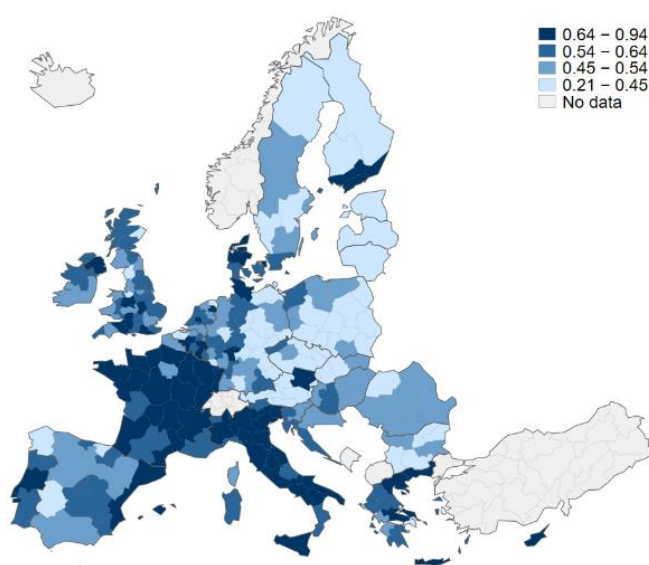
De nombreuses régions rurales ou anciennement industrielles, principalement en l'Europe de l'Ouest, ont traversé de longues périodes de prise au piège ou sont dans un risque significatif d'être prises au piège. C'est notamment le cas des anciennes régions industrielles du centre et du Nord-Est de la France, de l'Italie du Nord, de parties de la Wallonie en Belgique, du nord du Jutland au Danemark, de l'Est de l'Espagne ou de la région anglaise des Midlands. D'autres régions traditionnellement prospères, telles que la Basse-Autriche, le Sud de la Suède ou le sud de la Finlande, appartiennent également à cette catégorie. Certaines régions à faible revenu et faible croissance de l'Italie du Sud et de la Grèce – la plupart étant des « régions moins développées » selon les catégories établies par la politique de cohésion européenne – sont également dans ce groupe.

Le concept standard de piège du revenu intermédiaire a été exclusivement appliqué aux pays à revenu intermédiaire dans l'économie mondiale. La méthodologie de ce rapport produit un résultat qui diffère de manière importante pour les régions de l'UE, en cernant une tendance à la stagnation ou à la prise au piège à différents niveaux de revenus, et pas simplement dans les zones à revenus intermédiaires. En effet, il est démontré que les régions de l'UE ayant un revenu par habitant élevé ont un risque supérieur de tomber dans un piège du développement, de même que certaines régions parmi les moins développées.

Trois types de régions prises au piège ont été identifiés en fonction de leur niveau initial de développement :

a) **Les régions piégées à un niveau de revenu élevé** : Ce sont des territoires qui, malgré une relative prospérité en termes de PIB par habitant, ont connu des périodes prolongées pendant lesquelles la croissance économique, de la productivité et de l'emploi étaient inférieures à la normale, souvent associées à l'effondrement des industries qui constituaient leur principale source de richesse dans le passé. Ce groupe inclut la plupart des régions dans le centre et le Nord-Est de la France, le centre et le nord de l'Italie, le nord du Jutland au Danemark, le sud de la Suède, le sud de la Finlande et la Basse-Autriche. Ces régions ont connu un déclin économique relatif important, amenant plusieurs d'entre elles à se rapprocher des niveaux de revenu intermédiaire de l'UE.

b) **Les régions piégées à un niveau de revenu intermédiaire** : Ce sont des régions qui ont atteint, à la fin des années 1990, des niveaux de PIB par habitant se situant entre 75 % et 100 % de la moyenne de l'UE, mais dont le dynamisme économique a stagné depuis lors. En conséquence, elles ont eu des difficultés à améliorer leur situation, souvent à la fois en termes relatifs et absolus. Ce groupe comprend les régions du Mezzogiorno italien, des zones de Grèce proche d'Athènes et de Thessalonique, Valence et Murcie en Espagne, mais aussi des régions qui sont en déclin depuis longtemps en Wallonie (Belgique) et dans le nord de l'Angleterre (Royaume-Uni).

c) **Les régions piégées à un faible niveau de revenu** : Ce sont des régions qui, contrairement à la plupart des régions moins développées en Europe qui reçoivent un investissement substantiel de la politique de cohésion, ont rencontré des difficultés pour soutenir tous types de dynamisme économique, à des niveaux de PIB par habitant inférieurs à 75% de la moyenne de l'UE. Des régions telles que la Calabre en Italie, de la Macédoine orientale et la Thrace, l'ouest de la Grèce, la Thessalie ou l'Épire en Grèce, comme des régions au centre et à l'est de l'Europe telles que la Croatie adriatique ou la Transdanubie du Sud en Hongrie appartiennent également à ce groupe.

Qu'est ce qui détermine la probabilité qu'une région soit prise au piège ?

Les raisons de tomber dans un piège du développement diffèrent d'une région à l'autre. Toutefois, il existe un certain nombre de caractéristiques communes liées à l'évolution des structures économique et démographique – comme les niveaux de valeur ajoutée dans l'industrie ou le taux de dépendance, le capital humain et la capacité d'innovation, ainsi que la qualité institutionnelle – qui influent sur la probabilité de tomber dans un piège.

Les régions de l'UE qui sont dans un piège du développement tendent à afficher une part plus faible de la valeur ajoutée brute industrielle. La présence d'un secteur manufacturier plus compétitif aide les régions à devenir plus résistantes aux pièges du développement. Cependant, les régions qui dépendent davantage des services non marchands ont eu davantage tendance à stagner et croissent à un rythme plus faible que par le passé et/ou que les autres régions.

Les régions prises dans un piège du développement ont également tendance à présenter des taux de dépendance plus élevés et un dynamisme démographique moindre. En revanche, une productivité manufacturière plus élevée, une dotation plus élevée en capital humain – telle qu'une part plus élevée de travailleurs diplômés de l'enseignement secondaire et supérieur – et un soutien plus important de la science et de la technologie contribuent à empêcher les régions de tomber dans un piège du

développement. En particulier, les régions où les gouvernements investissent davantage dans la R&D ont un risque plus faible d'être piégées, comme les régions ayant une part plus élevée de leur population adulte diplômée de l'enseignement secondaire et supérieur.

La qualité du gouvernement local est un facteur supplémentaire affectant les chances d'être piégé. Les régions avec une meilleure qualité de gouvernement et des environnements institutionnels plus favorables s'en sortent mieux que celles avec une faible efficacité du gouvernement, une transparence et une responsabilité limitées ou une corruption plus élevée.

De façon générale, la structure sectorielle, les taux de dépendance et la qualité du gouvernement influent sur le risque de tomber dans un piège du développement de manière plus importante que la capacité d'innovation et la dotation en capital humain, bien que ces facteurs demeurent essentiels pour la croissance économique régionale.

Il existe des différences supplémentaires entre les trois types différents de régions prises au piège. Les facteurs structurels et les structures démographiques sont fondamentaux pour expliquer pourquoi certaines régions tombent dans des pièges du développement à des niveaux de revenu faibles. Toutefois, une meilleure qualité de gouvernement, un niveau de compétences plus élevé et un investissement public plus important en R&D sont essentiels pour réduire la probabilité des régions avec niveau de revenu élevé de tomber dans un piège.

Qu'est-ce-qui détermine la probabilité qu'une région sorte d'un piège du développement ?

Les facteurs qui diminuent la probabilité de rester piégé incluent la présence d'un secteur manufacturier plus important et plus résilient, une meilleure qualité de gouvernement, des dotations plus élevées en capital humain et une part plus importante de l'emploi dans la science et la technologie. En revanche, les régions avec une plus grande dépendance aux services non marchands sont davantage susceptibles de rester prises au piège.

Une fois de plus, on observe des différences entre chaque groupe et ce qu'il convient de faire pour sortir du piège. Les chances pour une région à faible revenus de sortir d'un piège sont améliorées par une plus grande productivité industrielle et davantage d'emplois dans la science et la technologie. Quant aux régions avec des revenus plus élevés qui sont prises au piège, les chances de s'en sortir sont favorisées par un investissement public plus important dans la R&D, une amélioration des compétences et, surtout, une meilleure qualité de gouvernement.

Ces résultats sont confirmés par les études de cas détaillées de quatre régions qui ont constamment obtenu des résultats élevés dans les deux indices de piège du développement : la Croatie Adriatique, à des niveaux de revenu faibles, les Abruzzes (Italie) et la Champagne-Ardenne (France) à des niveaux de revenu intermédiaires ; et le Sud de la Suède à des niveaux de revenu élevés. Les études de cas ont fourni des nuances supplémentaires et ont mis en avant la diversité des combinaisons de facteurs qui ont conduit des régions de l'UE à tomber et/ou à demeurer dans des pièges du développement. Elles ont également souligné l'absence de solution universelle pour éviter de tomber dans un piège du développement ou pour s'en échapper.

Le besoin de politiques permettant de mettre fin aux pièges du développement

Ce rapport montre que les pièges du développement sont un risque sérieux pour le futur de l'UE. Sortir de ces pièges et libérer le potentiel économique inexploité des

nombreuses régions en difficulté ou en stagnation dans l'UE contribuerait non seulement à maximiser le PIB, la productivité et la croissance de l'emploi dans de nombreuses régions qui ont pris du retard ou sont en train de décrocher, mais également à stimuler la compétitivité de l'UE dans son ensemble. Les régions qui ont souvent été les moteurs du développement économique européen dans le passé n'ont pas perdu tous leurs avantages du jour au lendemain. Beaucoup d'entre elles possèdent des ressources précieuses qui peuvent être mobilisées. Les laisser rester dans ce piège représenterait une perte de ressources et poserait des risques sociaux et politiques importants pour la stabilité des pays européens et de l'UE dans son ensemble.

Ce n'est pas seulement un enjeu économique : rester pendant longtemps dans un piège du développement contribue à une géographie du mécontentement croissante dans l'UE. Des performances économiques inférieures à la moyenne, un manque d'opportunités d'emploi et une perte de compétitivité, en raison d'une faible productivité, entraînent un ressentiment social et politique envers ce qui est de plus en plus considéré – justement ou injustement – comme un système ne bénéficiant pas aux zones laissées pour compte. Les pièges du développement alimentent la perception d'une Europe à deux vitesses, polarisée entre un nombre réduit de super-régions dynamiques et compétitives dans lesquelles les pouvoirs politique et économique sont associés, et un nombre croissant de régions qui sont de plus en plus perçues comme n'important pas ou comptant largement moins qu'à une époque.

Résoudre le problème du piège du développement dans l'UE représente un défi pour la politique de cohésion comme pour les politiques publiques nationales. Les pièges du développement ne peuvent être résolus que par des interventions plus efficaces et mieux ciblées qui vont au-delà de la préoccupation traditionnelle de la politique de cohésion européenne pour les régions les moins développées et de l'attention prioritaire des gouvernements nationaux pour les politiques visant à améliorer la compétitivité dans les régions les plus dynamiques. Mais les pièges du développement régional peuvent arriver dans l'UE à de nombreux niveaux différents de développement. Établir de telles politiques de développement – meilleures, plus intégrées et plus équilibrées – pour cibler les régions délaissées dans des pièges du développement permettra à l'UE de mieux combattre les inégalités régionales et la menace d'une montée du mécontentement.

1 INTRODUCTION AND GENERAL BACKGROUND

The Seventh Report on Economic, Social and Territorial Cohesion (European Commission, 2017b) identified the existence of a number of European regions at risk of falling into what is known as a 'middle-income trap'. The middle-income trap is a concept that was developed to explain the loss of growth dynamism by formerly fast developing national economies that have lost their economic edge and face considerable difficulties in moving up to the levels of development necessary to compete with high-income areas (Eichengreen, Park, & Shin, 2014; Gill & Kharas, 2007; Kharas & Kohli, 2011). This is explained by the rise of labour costs to the point where other territories become more attractive for labour-intensive or low-skill activities. The concept has a long tradition of being applied to countries that, after periods of rapid growth, failed to make it to the next development stage. However, apart from very few exceptions (e.g., Iammarino, Rodríguez-Pose, & Storper, 2017, 2018), the concept has seldom been applied to subnational territories, including regions.

The aim of this report is to address this gap in our knowledge and:

- Identify which regions in the European Union (EU) have fallen, or are at serious risk of falling, into a middle-income trap;
- Detect the factors that are preventing these economies from developing to their full potential;
- Establish what the economic, social and political risks associated with the presence of a middle-income trap are;
- Provide policy advice on what measures can be taken in order to move European regions out of this trap and prevent others from falling into it.

The focus of this project is on dynamics, rather than levels, in the sense that the interest lies in the growth trajectories of regions (and their determinants) for a given level of development, rather than in understanding how that level is achieved per se. Moreover, this analysis has a strong preventive aim. The fact that some regions appear to not have fully recovered from the post-2008 great recession raises concerns about the possibility of persistent local effects in response to large economic shocks and structural change more in general. The reversal of long-term declines or the capacity of putting territories back in an economic growth track can indeed be a challenging task for reactive policy due to the accumulation and cumulative causation of territorial disadvantages (Breinlich, Ottaviano, & Temple, 2014). This requires the attention of policymakers and other stakeholders not just ex post, to support stagnating or declining regions, but also in a forward-looking fashion, to help regions avoid falling into a middle-income trap in the future.

In particular, the above objectives will be fulfilled by pursuing the following:

- Literature review on the middle-income trap, both at the national and subnational level, with the aim of proposing a conceptual framework to develop a suitable methodology aimed at identifying middle-income trap economies, or more generally development traps.

- Development of the methodology,, for the identification of EU regions that are (or are at risk to be) caught in a middle-income or development trap, ideally distinguishing between different types or groups of trapped regions in the EU, and different modes of reaching the trapped stage.

- Analysis of the factors that are preventing the full development of the economic potential of regions in the EU using a variety of econometric techniques,

considering spatial spillovers, and differentiating trends by time span, i.e. before and after the economic and financial crisis.

- In-depth case study analysis of selected trapped regions, considering different levels of development (low-, middle- as well as potentially also high-income regions), with a view to identify, in greater depth, what socio-economic factors are either assimilating or distinguishing different types of regional development trajectories. Moreover, the case studies will present prospects in order to help regions move out of the trap, as well as prevent regions from falling into it in the future.

- Provision of a series of policy recommendations on how to avoid the negative consequences of the development traps and put trapped regions back on the track to economic development.

The report is structured as follows. Section 2 takes stock of existing knowledge on middle-income traps, providing a conceptual framework for studying this topic at the subnational level. Building on this framework, Section 3 reviews the empirical approaches used in the literature on middle-income traps in particular and growth slowdowns/development dynamics more in general, and proposes a methodology suitable for identifying regions that are (or are at risk to be) caught in a trap in Europe. It also discusses some descriptive results on middle-income traps, challenging the merits of this definition and introducing the alternative concept of 'development trap'. Section 4 presents the methods and the results of an econometric analysis aimed at identifying the factors that are preventing the full development of the economic potential of trapped regions in the EU. Section 5 summarises the main points that emerged from the in-depth case studies of four regions selected based on the previous analysis. Finally, Sections 6 and 7 discuss policy recommendations and provide concluding reflections.

Throughout the report, the term 'EU' is used to refer to the EU28, including the UK, and the expression 'European Regions' to denote all regions in the EU28.

2 ABOUT THE MIDDLE-INCOME TRAP IN REGIONS OF THE EU: DEFINITION AND LITERATURE REVIEW

2.1 Defining Middle-Income Traps

The concept of middle-income trap has been mainly used to describe countries that suffer from a sharp drop in economic dynamism after a successful transition from low-income to middle-income status, preventing them from moving to a higher income level (Gill & Kharas, 2007). Middle-income economies have, according to Kharas & Kohli (2011, p. 282), "bursts of growth followed by periods of stagnation or even decline, or are stuck at low growth rates", meaning that "instead of steadily moving up [the development ladder] over time, their GDP per capita simply gyrates up and down". While most of these slowdowns take place in the transition from low- to middle-income, other researchers have found that the growth slowdowns can happen at different stages of development, allowing to distinguish between different levels – and, consequently, different characteristics – of middle-income traps (Eichengreen et al., 2014).

The notion of middle-income traps was initially developed to describe growth dynamics of national economies, with an emphasis on countries in Latin America, the Middle East, North Africa and East Asia. More recently, this concept has also been used to study the Chinese experience, as its growth rates have appeared to decelerate (e.g., Cai, 2012). In the past few years, a small but growing body of research is starting to

apply this concept to subnational spatial units (European Commission, 2017b; Iammarino et al., 2017, 2018). This also allows extending and refining the scope of what constitutes 'middle-income' by looking at distributions even *within* countries or groups of countries whose level of wealth is high relative to the *global* distribution of income per capita. What follows reviews the existing literature on middle-income traps with an emphasis on defining it and clarifying its concept. The focus is on the implications of using this notion to describe growth dynamics at the regional, rather than national, level and for more advanced groups of countries. For recent surveys of the empirical literature at national level with a focus on emerging economies, please refer to Agénor (2017) and Glawe & Wagner (2016).

2.1.1 Conceptual Clarifications

The definition of middle-income traps rests on two key concepts: the notion of middle income, and the economic notion of trap. The latter is especially important and must be distinguished from the related, but theoretically distinct, concept of convergence.

In development and growth economics, traps are understood as a persistent and stable state of low (or inexistent) development, typically associated with one of several plausible equilibria given certain structural features of the economy. Falling into this `bad equilibrium' is usually associated with self-reinforcing mechanisms linked to market or institutional failures, so that a policy shock or some kind of structural change is required in order to overcome the trap (see Azariadis & Stachurski, 2005, for a comprehensive discussion of traps, with a specific application to poverty traps). This is conceptually different from convergence, which describes a state of *transition* towards a unique steady-state equilibrium – where convergence can be understood in absolute or conditional terms (see Barro & Sala-i-Martin, 1992, and Barro, Sala-i-Martin, Blanchard, & Hall, 1991, for two seminal contributions to this literature, and Magrini, 2004, for a systematic review). From a purely empirical perspective, the presence of traps can often result in slow (or absent) convergence, meaning that disentangling one aspect from the other can be challenging. Conceptually, however, they are very different. As pointed out by Agénor (2017, p. 786): "In the conventional approach to growth convergence, countries that share the same characteristics eventually reach the same unique equilibrium and the same growth rate. By contrast, in models with multiple equilibria, two countries that are otherwise identical may converge to different growth rates, depending only on their initial conditions". Importantly, being caught in a trap opens to the possibility to intervene with a policy shock that addresses the conditions causing these traps, thus setting the economy on the path to a different, more favourable, equilibrium. Similarly, understanding the conditions empirically associated to such traps can support preventive policies aimed at helping economies avoid falling into traps.

On a related note, it is also important not to confuse the notion of a middle-income trap with that of the more widely used *poverty* trap. Poverty traps are bad equilibria locking an economy in a state of little or no growth at very low-income levels. Effectively, this entails that said economy never experienced bouts of growth. Instead, middle-income traps take place following an economy's sustained growth thrust which pushed it into the middle-income status or is the consequence of a long-term economic decline of a formerly advanced economy. As such, this type of trap is concerned with the factors that cause the economy to experience a slowdown and plateauing of its past dynamism or just simply to go in reverse, leading to stagnation at middle-income level. This has important implications for the analysis of determinants of middle-income traps, since these are often related to the composition and quality of production factors, rather than their quantity, as shall be discussed later in this review. This is especially important for the present work, which focuses on geographical units whose middle-income status is evaluated with respect to levels that would otherwise qualify as high in the global distribution.

Identifying middle-income traps indeed also requires a definition of what constitutes middle-income for an economy. The scholarship has looked at two types of measures: absolute income per capita, and relative income per capita. Absolute measures rely on categories defined using thresholds that are independent of the performance of other economies. Importantly, this implies that the number of economies falling in each category is undetermined a priori. A commonly used definition is provided by the World Bank, which divides economies into four income groups based on their per capita gross national income (GNI): low (less than USD 995), lower-middle (between USD 996 and USD 3,895), upper-middle (between USD 3,896 and USD 12,055), and high (USD 12,056 or more).[4] By contrast, relative measures determine income groups on the grounds of some benchmark usually obtained by looking at the distribution of income across economies. This reference typically reflects some ideal `target value' based on one or more top performing economies, or on the mean values across all units. As an example of the former, Athukorala & Woo (2011) develop a `Catch-Up Index', which expresses the gross domestic product of an economy as a share of the US one (with thresholds for low, middle and high income groups at 20 and 55 percent respectively). The EU's eligibility criteria for regional development funding, which divide regions in development groups based on where they fall with respect to the average per capita regional GDP across the EU (as a share thereof), is an example of the latter approach. Im & Rosenblatt (2013) highlight that approaches favouring absolute measures for income groups seem more appropriate to study the factors associated with prolonged periods of stagnation, while those relying on relative measures relate indirectly to the convergence literature and are apt to explaining catch-up processes. Nevertheless, Agénor (2017) notes that both types of measurement suffer from the fact that relevant thresholds are defined somewhat arbitrarily by the researcher, which can lead to inconsistent outcomes across empirical analyses.

2.1.2 Structural Determinants

Regardless of the stage of development at which growth slowdowns take place (and definitions thereof), one prominent feature of all middle-income trap economies is that they reach a development level in which production costs rise well above those of low- and lower-middle income countries, while their skill components and their innovation capacity remain below those of high-income countries (Gill & Kharas, 2015; Kharas & Kohli, 2011). It is therefore frequently the case that low-income countries that go through rapid growth spurts (what are often known as "economic miracles") for a certain number of years, abruptly hit a wall that often marks the beginning of a long-term slowdown. Underlying this slowdown are falling gains from reliance on low-wage labour and technological imitation. In other words, as they approach middle-income levels, economies are unable to carry on developing on the grounds of moving labour from agriculture into the export-oriented industry, where production adopts foreign-generated technologies. This is because constraints in the supply of low-skilled workers lead to rising wages that reflect marginal productivity gains rather than subsistence levels (Lewis, 1954). This continues to the point where other countries become more attractive for labour-intensive or low-skill activities.

Economists have described this as a `turning point' away from the Lewis-model in the growth process of an economy (Gollin, 2014). At its core is a process of structural transformation that, if unsuccessfully managed, is associated to the risk of falling into a middle-income trap (Vivarelli, 2016). Such economies are wedged in-between two worlds: they are neither as productive nor as innovative as the high and very-high

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[4] The thresholds are defined using current US dollars values of GNI, estimated using the World Bank Atlas method, which relies on a price-adjusted conversion factor that uses smoothed exchange rates based on moving averages over a three-year window. Further details are available at the following webpage: https://datahelpdesk.worldbank.org/knowledgebase/articles/378832-what-is-the-world-bank-atlas-method

income economies, but their labour and land prices are not as low as those of the lower-income ones. As these economies reach middle-income status, they are incapable of retaining their competitiveness in mature labour-intensive industries that rely on a low-wage workforce and standard technologies. At the same time, they are ineffective in entering new innovation-intensive sectors that rely on frontier knowledge. Acemoglu, Aghion, & Zilibotti (2006), for instance, model an economy at the crossroads of two development strategies: adoption of pre-existing technologies, or innovation at the frontier. The latter strategy requires selection of higher quality firms and entrepreneurs that increase the likelihood of success. In the early stages of development, firms in the economy primarily invest in acquiring existing technologies and thus can afford less selection. As the economy develops and approaches the technological frontier, it increasingly relies on innovation and thus promotes entrepreneurs with higher skills. Crucially, however, the authors discuss how late-switching from an adoption- to an innovation-led strategy can result in a `non-convergence trap' characterised by low growth due to inadequate pursuit of innovation opportunities. This equilibrium is driven by the ability of incumbent firms to use rents to protect themselves from more efficient and innovative entrepreneurs. Benhabib, Perla, & Tonetti (2014) develop a conceptually similar model where economic agents segment into imitators or innovators. Innovators act at the technology frontier while imitators exploit catch-up opportunities. Agents who are relatively productive but not enough to generate innovation eventually `fall-back' onto the balanced-growth path of imitators, a process that can provide further theoretical foundations to the notion of middle-income trap. More recently, Aghion & Bircan (2017) provide a discussion of the Schumpeterian foundations of middle-income traps, with an emphasis on the institutional factors required to support an economy undergoing structural transformation onto a new growth path. Vivarelli (2016) also emphasises this dimension.

2.1.3 Total Factor Productivity and Other Dimensions of Slowdowns

Several studies concur that at the core of these middle-income slowdowns is stagnating productivity growth. In a static framework, Hsieh & Klenow (2010) document that total factor productivity (TFP) accounts for 50 to 70 percent of cross-country differences in output, affecting a country's performance both directly and indirectly, via their interaction with physical and human capital. Eichengreen, Park, & Shin (2012) examine a large panel of countries observed between 1957 and 2007. Using standard growth accounting techniques, they conclude that falling TFP growth explains about 85 percent of the deceleration in output growth. In their view, "Growth slowdowns, in a nutshell, are productivity growth slowdowns" (Eichengreen et al., 2012, p. 54). This finding is echoed by Aiyar, Duval, Longmei, Puy, & Wu (2013), who estimate that TFP is key in explaining the slowdown of Latin American economies during the 1980s and accounts for more than half of growth in GDP per capita experienced by East Asian economies since the 1970s. It also aligns with the findings of Hall & Jones (1999).

What explains these slowdowns in TFP growth? Due to diminishing marginal returns to physical capital, the standard neoclassical growth prediction maintains that economies with initially lower levels of capital per worker will subsequently experience higher growth rates thanks to larger productivity gains. As economies develop and capital deepening takes place, productivity gains are increasingly exhausted (Solow, 1956). In addition, some of the other characteristics that have been associated with the notion of a middle-income trap in national-level studies (Agénor, 2017) include low human capital accumulation (or poor quality thereof), sectoral resource misallocation (due to distorted incentives), lack of or inadequate *advanced* infrastructure, and limited access to finance. Most of these factors fundamentally relate to productivity or innovation (K. Lee, 2013).

Redding (1996), for instance, formalises the issue of human capital with a model of endogenous growth that relates investments in education by the workforce to expenditure in R&D and product-quality improvements by firms. In the model, these investments are strategic complements, meaning that the decision of workers to invest in skills-acquisition depends on the decision of producers to invest in R&D. Jointly, these decisions determine the growth rate of the economy. In the presence of sufficiently high fixed costs to R&D, multiple equilibria may arise. One of these is characterised by little investments in research and accordingly low skill-acquisition among workers, leading to lacklustre growth. This equilibrium can be described as a middle-income trap and its fundamental source traced back to human capital.

Middle-income traps are also associated to resource misallocation and (lack of) access to advanced infrastructure. Agénor & Canuto (2015) formalise the relevance of these two factors jointly in a model where workers with heterogeneous skills endogenously sort into manufacturing or design (innovation) occupations depending on relative wages across the industries. In addition, the provision of advanced infrastructure, defined as information and communication technologies (ICTs), and high-speed networks, creates a knowledge network externality in the design sector. This externality depends non-linearly on the share of the population employed in innovation activities. As a result, the model features multiple equilibria, one of which is characterised by low productivity and low proportion of high-skilled labour working in the design sector, which the authors explicitly associate to the notion of middle-income traps. For them, greater access to and provision of advanced infrastructure can support an economy in its transition out of the trap by increasing productivity (thus, wages and occupation) in the design sector.

Other aspects to consider include the quality of the business environment, its regulation, and innovation ecosystems. In particular, Agénor & Canuto (2017) discuss the importance of access to finance on innovation activity and ultimately growth. Innovating firms may face financing constraints due to costly monitoring of their performance on the part of lenders. This could occur because their assets are often intangible and difficult to value, their expenditure is hard to collateralise, and information frictions tend to be high due to the firms' possible reluctance to disclose strategic information regarding their knowledge assets. As a result, financial intermediaries may charge higher rates or refuse lending altogether, curbing innovation and growth prospects. Moreover, with sufficiently high monitoring costs, it is possible that relatively lower wages reduce the attractiveness of the innovation sector and thus the incentives of workers to invest in human capital required to access it. This would lead to a low-growth, low-skills and low-innovation steady-state that can be interpreted as a middle-income trap. Aghion, Howitt, & Mayer-Foulkes (2005) discuss the broader issue of financial development and its effect on access to finance in the context of a Schumpeterian growth model predicting club-convergence.

In addition to the above-described determinants, there are of course many other factors potentially linked to middle-income traps. Institutions, in particular, whether formal or informal, are argued to play a prominent role (Hall & Jones, 1999; North, 1990). There are many channels by which institutions may matter. For instance, an adequate rule of law, efficient legislation and governments, as well as greater transparency and accountability can prevent slowdowns in economic growth (Aiyar et al., 2013). These will be reviewed more in detail with respect to regional middle-income traps. At this stage it is important to note that, according to Doner & Schneider (2016), escaping middle-income traps is especially difficult due to the politics involved with promoting the appropriate public intervention, which is of 'institution-intensive nature'. Many countries and regions which are either lagging behind and/or at risk of being trapped in slow growth trajectories have weaker institutional constructs than their more advanced counterparts (Charron, Dijkstra, & Lapuente, 2014). Even when the formal and informal institutional settings is relatively strong, such countries and regions may be constrained by the lack of the overall ability to engage in institutional change ('social capabilities' for growth – see

Abramovitz, 1986; Rodríguez-Pose & Di Cataldo, 2015; von Tunzelmann, 2009), therefore experiencing institutional lock-in and hampering innovation and structural transformation (Hassink, 2010). In sum, this view supports the idea that much of the middle-income trap problem is related to political economy and institutional considerations rather than just economics. Other soft factors such as path dependency and history also appear to matter (Redding, 2002).

Against this background, the theory surveyed above suggests that middle-income trap economies face some of the hardest developmental challenges: moving up requires much higher investment per worker than in the early stages of development, because it needs greater skills. Improving the quality of firms also requires more investment in hardware and software. And the entire society necessitates more investment in infrastructure, education and better institutions to sustain a higher quality, more innovation-prone and cost-sensitive growth processes.
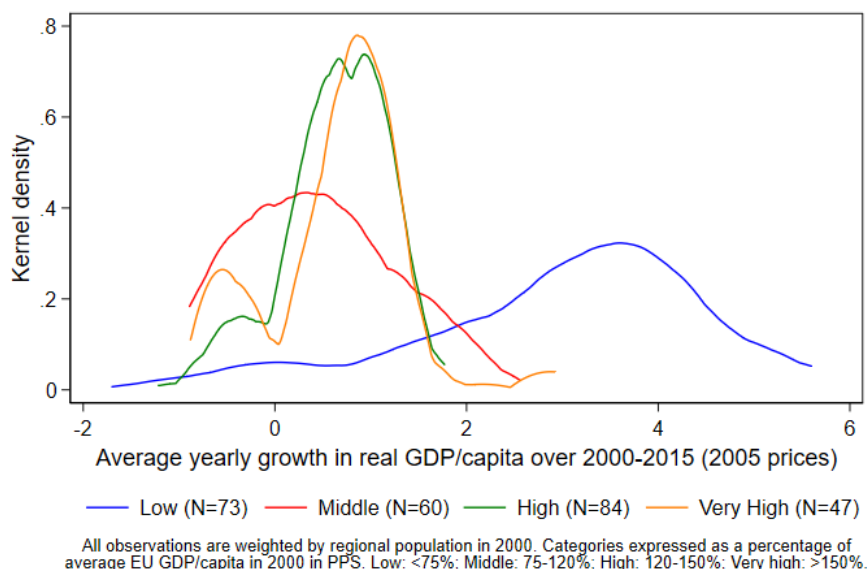
2.2 Regional Middle-Income Traps

Until recently, the middle-income trap concept has been mainly applied to national economies. It was generally associated with countries that stagnated once they reached levels of development of between USD 10,000 and 11,000 and/or USD 15,000 and 16,000 (Eichengreen et al., 2014). Few researchers have so far considered applying the concept to subnational economies and, mainly, to regions. Barrett & Swallow (2006) acknowledge the possibility of a fractal dimension to traps, theorising a situation where multiple equilibria coexist at different spatial scales and reinforce each other through feedback effects. Their analysis, however, focuses on the traditional notion of poverty traps and is silent about the dynamic of middle-income economies. Yet, it is becoming increasingly clear – at least in the context of the EU – that certain groups of regions are suffering from the same or similar problems as those described for certain countries that have fallen into a middle-income trap. In an early contribution to the European debate, Fagerberg & Verspagen (1996) study convergence patterns in Europe and conclude that there appears to be a `Europe at different speeds', with groups of regions characterised by distinct dynamics linked to differences in structural features, such as productivity and unemployment. Similar findings are highlighted by the theoretical and empirical work of Quah (1996a, 1996b, 1997) on convergence clusters. More recently, Storper (2018) discusses the growing interregional divergence of economic fates and political polarisation across Europe, reviewing existing explanations in the literature and identifying key research priorities for regional science and urban economics related to this issue. Consistent with all these results, Figure 1 shows the distribution of average annual growth in real GDP per capita (in 2005 constant prices) over the 2000-2015 period for different groups of regions in the EU. In line with Iammarino et al. (2017, 2018), thresholds are defined at 75, 120, and 150 percent of average GDP per capita in PPS across European regions. This allows distinguishing four groups, or `clubs', of regions: very high income, high income, middle income, and low income. Values of 2000 levels are used to classify regions for this graph, which coincides with the beginning of the series considered.[5] All observations are weighted by 2000 population. In accordance with the neoclassical convergence hypothesis, many of the less developed regions in 2000 displayed strong growth performance over the subsequent 15 years. It should be noted, however, that such regions were mainly those in Central and Eastern European economies, which joined the EU between 2004 and 2007, whilst the traditional southern periphery of Europe failed to achieve comparable high-growth rates. Conversely and partly departing from standard convergence predictions, some very

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[5] This definition of middle-income is used here for the sake of painting a descriptive picture. We will consider more flexible notions of middle-income later in the analysis as part of the empirical work of this project. Figure 31 in Appendix proposes a similar graph using different, more detailed categories.

high-income regions still registered good rates of growth. High-income regions display a similar distribution.

Figure 1: Distribution of average annual per capita real GDP growth over 2000-2015 in the EU

All observations are weighted by regional population in 2000. Categories expressed as a percentage of average EU GDP/capita in 2000 in PPS. Low: <75%; Middle: 75-120%; High: 120-150%; Very high: >150%.

Growth performance at the top and at the bottom of the regional spectrum contrasted with the performance of middle-income regions. Many of them displayed some of the poorest performances in Europe, as evidenced by the presence of a relatively large number of regions in this group among those with low growth rates. The present work is especially interested in explaining the poor growth performance of the middle-income group of regions, where the bulk of potentially trapped regions can be expected. Nonetheless, it will examine low growth regions across all groups, remaining a priori agnostic about development levels. Figure 32 in Appendix offers an alternative way for studying these patterns, using a trend diagram.[6]

The numbers of European regions that have witnessed their economic development stagnate after reaching a level of development hovering between 75 and 120 percent of the EU average GDP per head has not ceased to increase in recent years. This is illustrated descriptively in Figure 2, which shows the increasing share of total EU population living in regions classified as middle-income (GDP per head in PPS between 75 and 120 percent of the EU average in each year).[7] Although the graph does not immediately clarify the composition of middle-income regions (e.g., whether it is poorer regions catching up or wealthier regions declining), it suggests that transition out of the middle-income category is rare as this group has grown larger over time. This trend has been exacerbated by the economic and financial crisis that started in 2008, when productivity stagnation and industrial decline became the rule for many territories, substantially reshaping the economic geography of Europe — and fuelling subnational inequality (European Commission, 2017b). Many regions that experienced relatively high growth in the past are struggling to move to a higher stage of development. Similarly, formerly well-off regions have moved into prolonged periods of relative economic decline, bringing their levels of GDP per capita to below the average of the EU.

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[6] See the description in the Appendix for details.
[7] The time series begins in 1990 because the data are available for most EU regions only from this year onward.

Figure 3 compares the average annual growth rate in real GDP per capita of European regions over the longest available time series (as far back as the 1980s until 2015), and in the post-crisis period (2008-2015). It is evident that some of the regions that displayed weak growth performance in the long run, were also hit particularly hard by the crisis. Other places that grew more strongly in the past were also affected in more recent years. Many of these regions, such as Sicily or parts of Greece, are in the periphery and account for less developed parts of the EU. Others, however, such as Piedmont, Val d'Aosta, Lazio and Marche (IT), Champagne-Ardenne and Picardie (FR), or even Groningen and Drenthe (NL) are located closer to the European core and normally fall near or fully in the middle-income range of European per capita incomes.

Figure 2: Share of EU population living in middle-income regions (1990-2015, EU28)
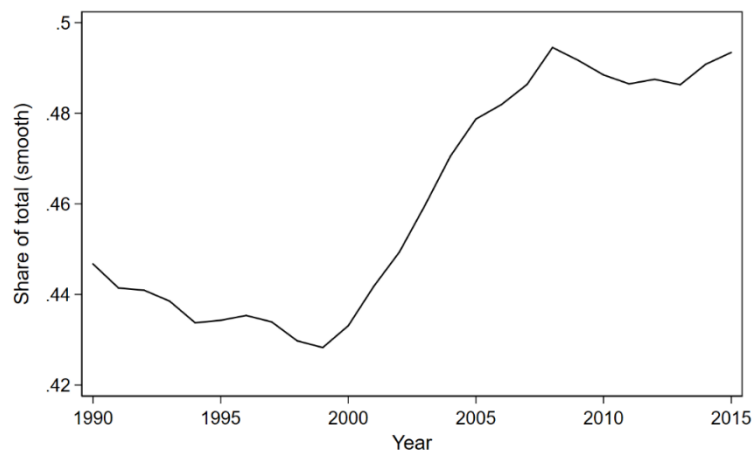
Note: Categories are defined using national income per capita relative to the EU average, with middle-income regions falling between 75 and 120 percent of the EU average in each year.

However, despite the increasing evidence of long-term economic stagnation across many regions in Europe, this phenomenon has so far attracted limited attention in the scholarly literature. Two notable exceptions are the Seventh Report on Economic, Social and Territorial Cohesion (European Commission, 2017b) and Iammarino et al. (2017, 2018). These analyses document the emergence of subnational `economic clubs' of development, describing regions that feature wide differences in terms of GDP growth, industrial structure, employment, education, productivity, innovation, as well as urbanisation and demography. Of these groups, possibly the most heterogeneous one is that formed by regions in the middle-income range. It includes former manufacturing regions that have today lost a large share of their industry jobs, as well as amenity-rich areas that are attractive for their low-cost of living and that specialise in local non-tradeable service jobs. Regions in this group share low levels of productivity and stagnating growth performance. In a similar vein, the recent `Lagging Regions Report' (European Commission, 2017a) emphasises the importance of distinguishing between low-income and low-growth regions. While the former tend to be poorer European regions located in the geographical periphery, the latter represent a more heterogeneous group that spans across different levels of development, often encompassing places with levels of GDP per capita near or even above European averages.

Figure 3: Real GDP/head growth in the EU for 1980-2015[8] (left) and 2008-2015 (right)
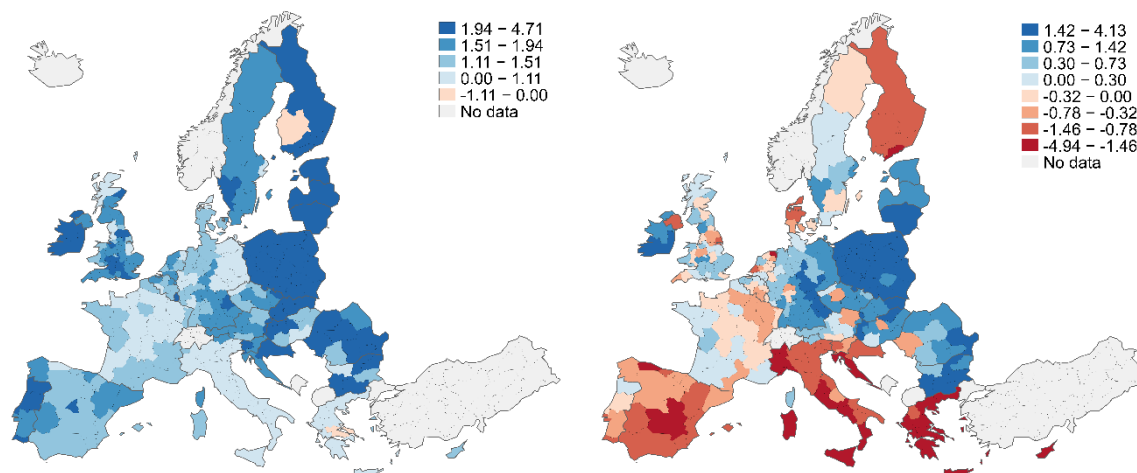
Scholarly neglect has also been matched by neglect in the policy realm. Considerable attention has been devoted to the least advanced regions of Europe due to the economic and social problems they pose. On the other hand, more recently and following recommendations by the new economic geography and urban economics strands, policy has focused on the largest and most economically dynamic urban agglomerations, in consideration of their perceived economic potential. By contrast, middle-income regions have struggled to attract the interest of development planners. This has led to a growing sense of distress and anger that is increasingly challenging economic and social cohesion in the EU. The challenge for policymakers, then, is to strike a balance between efficiency and equity, sustaining the economic engine of booming urban agglomerations while at the same time counteracting inequalities arising with respect to suburban and rural areas including those at middle-income level. This requires awareness of the specific developmental challenges faced by regions in each club. In particular, Iammarino et al. (2017, 2018) call for reliance on `place-sensitive distributed development policies' (PSDDP) to calibrate public intervention to the needs of each region. In discussing strategies for middle-income regions, the authors explicitly propose to frame the issue using the conceptual toolset of middle-income traps developed by the national-level literature. What follows discusses this analogy more in detail. It reviews the applicability of the middle-income trap notion to subnational spatial units, highlighting similarities and differences and outlining key features of middle-income regions as discussed in the relevant literature.

2.2.1 Characteristics of Middle-Income Trap Regions

Although properly defining and identifying middle-income trap regions is a task that will be carried out on empirical grounds as part of this report, some of the basic characteristics of what constitutes a middle-income trap (henceforth, MIT) region can already be highlighted at this stage, based on previous work conducted by the authors

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[8] In some countries, regional data was not available for the entire period. We thus report averages over the longest period available. These cases are (first available year in brackets): Bulgaria (1991), Cyprus (2000), Czech Republic (1990), Estonia (1993), Croatia (1993), Hungary (1991), Lithuania (1992), Luxembourg (2000), Malta (1991), Poland (1990), Romania (1990), Slovenia (1991), and Slovakia (1993). In addition, the following regions had limited data availability: Berlin, Brandenburg, Mecklenburg-Vorpommern, Dresden, Chemnitz, Leipzig, Sachsen-Anhalt, Thüringen (Germany, 1991 onward only); Mayotte (France, 2000 onward only); Flevoland (Netherlands, 1986 onward only). Moreover, the legend in this map omits values for the Autonomous Portuguese regions of Açores and Madeira, not represented, which fell below the lowest category (bounded by the median of negative values and zero).

of this report (Iammarino et al., 2017, 2018). The characteristics of these regions are in many ways comparable to those described for middle-income trap nations:

- Their costs are far too high to compete in the production of basic goods and services with less advanced regions in the EU and low- to lower-middle income nations outside the EU borders;

- Their level of skills and innovative capacity are not comparable to those of the high-income regions of the EU, meaning that the potential to compete in advanced and technology-intensive goods and services is limited;

- Their economic stagnation has been accentuated by processes of international outsourcing, offshoring, and by limited capacities either to attract inward investment, or to support the internationalization of domestic firms, or both;

- The result is prolonged periods of stagnation, higher average levels of unemployment (especially, long-term unemployment) and, in some cases, demographic decline.

There are, however, some important differences between the emergence of MIT regions in the EU, and what the extant literature has described for middle-income trap nations. First, **the middle-income trap in European regions is taking place at a higher level of GDP** per head than that described for middle-income trap nations. Second, the path towards stagnation across European regions does not occur just after a successful transition from low- to middle-income but adopts a variety of trajectories that also includes long-term economic decline of formerly wealthy regions (thus also transition from high- to middle-income) as a result of industrial and technological structural change. Moreover, these processes are at the root of the emergence of an increasingly visible 'geography of discontent', which is having profound economic, social and political implications across Europe (Dijkstra, Poelman, & Rodríguez-Pose, 2018; Rodríguez-Pose, 2018). These recent developments in the European political landscape echo a prophetic warning by Judt (1996) that polarisation between a handful of dominant `super-regions' and a lagging or stagnating periphery would threaten European integration and potentially lead to a resurgence of nationalist sentiment.

MIT regions in the EU are generally expected to fall within a GDP per capita range between 75% and 120% of the average of the EU, and their economic growth and employment generation has been below that of other groups of regions. Many of them have suffered steep industrial declines, as a result of the greater competition by manufacturing firms in less developed regions of the EU but, especially, from emerging countries. Persistent processes of industrial outsourcing and offshoring have contributed to economic decline or enduring stagnation (Crescenzi & Iammarino, 2017; Iammarino & McCann, 2013). Large numbers of regions in north-western Europe, but also in southern European countries, as well as some of the most developed regions in Central and Eastern Europe, are included within this range (see `Medium' category in Figure 5) and have been affected by the above-mentioned processes. The sheer number of regions that could be classified as MIT conceals a vast diversity in terms of characteristics and evolutionary trajectories: they possibly form the more internally heterogeneous group of territories within the EU. As emphasised by Iammarino et al. (2017, 2018) and by the Seventh Cohesion Report (European Commission, 2017b), it is possible to identify two distinct MIT sub-groups.

Figure 4: European regional development clubs in the EU
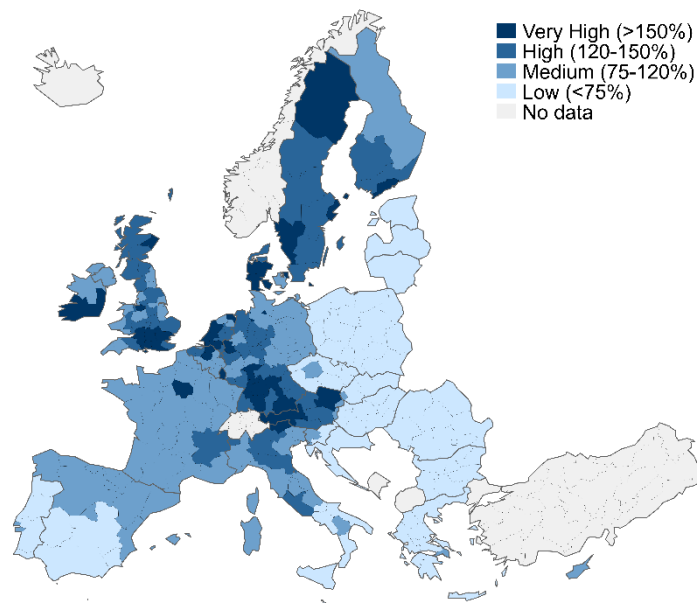
Note: Figure based on Iammarino et al. (2017, 2018). Categories are defined using regional income per capita relative to the EU average in 2013, as follows: 'Very High' is 150% or greater; 'High' is 120-150%; 'Medium' is 75-120%; and 'Low' is less than 75%. Please see the cited study for further details.

The first, arguably the largest, includes former industrial regions that have typically experienced a considerable decline in manufacturing activity over the past few decades, which has affected employment and stifled population growth. Partly owning to their industrial past, these regions tend to display inadequate skill levels among their workers, relative to other more dynamic European regions. Overall, regions in this category are economically fragile because of the combination of declining manufacturing – often offshored to foreign locations –, unsatisfactory educational attainments and skills, and insufficient labour-force participation. This group could be said to be approaching middle-income levels `from above', in the sense that what were once relatively well-off regions have experienced sustained relative economic decline due largely to structural transformation, pushing them into the middle-income ranks.

The second sub-group captures places that have approached middle-income levels `from below'. These are formerly lagging behind regions that experienced often rapid growth spurts, but that have remained stuck at levels of development often between 75 and 90 percent of the average of the EU. Many of them feature a combination of positive amenities and low-cost of living. Many regions in this group remain demographically dynamic, partly because of their ability to attract older cohorts of workers looking for affordable living around amenities. This in turn stimulates moderate inward migration of skilled workers employed in non-tradeable local service jobs. Overall, however, labour-force participation remains low. Moreover, one important drawback in this subgroup is that jobs in non-tradeable local services feature limited upgrading capacity, innovation potential, and international openness. These features depress productivity and the per-capita income benefits of such employment gains, potentially leading to polarisation in the spatial distribution of wages (Autor & Dorn, 2013).

To these sub-groups, a third set of regions can also be added: places that, once at middle-income levels, remain at these levels when considering today's regional distribution of GDP per capita. Regions in this sub-group essentially never grew enough to improve their relative performance compared to other places in the EU.

2.2.2 Exploring the Notion of Development Traps

Considering all the above, it may thus be limiting or even misleading to refer to such regions as falling into `middle-income' traps. EU regions start off at much higher levels of development in absolute terms, which is reflected in a large variety of growth trajectories across places that could qualify as trapped, or at risk of becoming trapped. As such, it is worth highlighting the importance of considering alternative conceptualisations of middle-income traps when looking at the regional dimension. It could well be that a more appropriate way of translating this notion at subnational level will refer more in general to a `development trap', rather than `middle-income trap'. Section 3.2.3 comes back to this point, providing further evidence in support of this claim. In what follows, the report will thus begin discussing the notion of `development trap' (henceforth, DT), alongside that of MIT. Occasionally, when needed for consistency and clarity with the initial objective of this report, the latter will still be used.

Irrespective of terminology, the main common denominator of trapped regions is that they are stuck between a rock and a hard place: they have become "unable to compete with low-income, low-wage economies in manufactured exports and unable to compete with advanced economies in high-skill innovations" (Kharas & Kohli, 2011, p. 282). And given their number, demographic weight, political power and economic potential, this represents a critical economic, social and political problem for the EU as a whole. Section 3 of this report reviews methodological solutions used in the literature to identify areas in (or at risk of falling in) a middle-income trap. It then discusses the proposed methodology to identify regions at risk of falling in a middle-income trap in the EU, as well as the preliminary results in terms of what types of regions fall into this category. The characteristics outlined so far will offer useful guidance in interpreting these results.

2.2.3 Factors Holding Back Some EU Regions

To guide the empirical analysis that follows this review, some preliminary insights on the factors holding back economic development in middle-income regions can be derived from the national-level literature presented in Section 2.1.2 (e.g. Agénor, 2017; Aiyar et al., 2013; Doner & Schneider, 2016; Gill & Kharas, 2015; Kharas & Kohli, 2011 for reviews). Of course, this report presents a substantially different research setting as it is concerned with subnational units in Europe. Therefore, national-level findings need to be appropriately re-interpreted through the lens of the economic geography literature and subnational evidence, and integrated with the contextual insights offered by the national level studies. As discussed in Section 2.1.2, three main factors stand out:

- Local economic structure,
- Total factor productivity (TFP), and
- Institutional quality.

What follows discusses the relevance of these factors with respect to the research setting of this project.

Local Economic Structure

At the national level, the importance of the economic structure builds on the notion of a turning point in the standard Lewis-type development process. Accordingly, a successful transition from agriculture to industry, and from industry to high-skilled and high value-added activities, is fundamental for preventing countries from falling into the middle-income trap and/or escaping it. This requires an upgrading of the economic structure and a transition from imitation-based to more innovation-intense strategies. This largely holds true at the regional level.

Figures Figure 5, Figure 6 and Figure 7 present binned scatter plots relating the shares of employment and gross value added (GVA) in agriculture, industry, and financial and business services to the development level of European regions over the 1980-2015 period.[9] Figure 5 shows that the importance of agriculture, forestry and fishing on overall employment and GVA shares falls steadily as regions develop.

Figure 5: Binned scatterplots relating shares of employment and GVA to development

Agriculture, Forestry and Fishing (A)
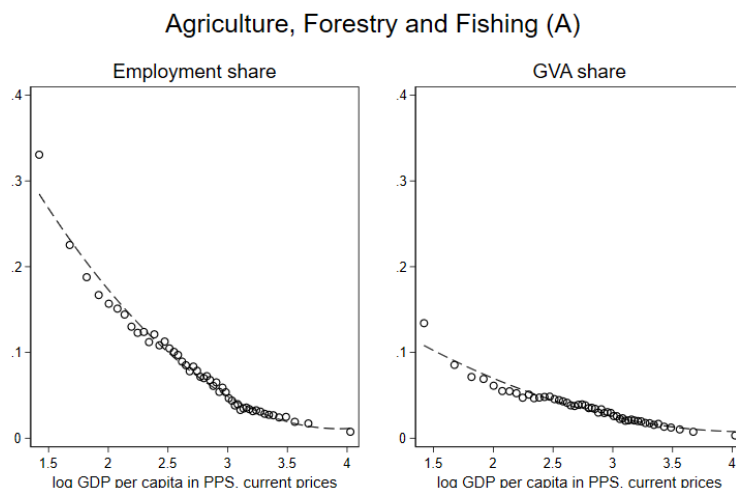
Industrial employment and GVA shares, on the other hand, decline much more slowly (Figure 6). Interestingly, employment in industry falls to less than 20 percent of the total around middle-income levels and eventually settling below 10 percent. By contrast, industry still represents over 20 percent of overall value added even at high levels of log GDP per capita, suggesting substitution of labour-intensive technologies with more capital-intensive production. These descriptive findings obtained using regional data support the idea of innovation and technological change playing a role around middle-income levels not just across countries, but also at sub-national level in the EU.

Figure 6: Binned scatterplots relating shares of employment and GVA to development

Industry (B-E)
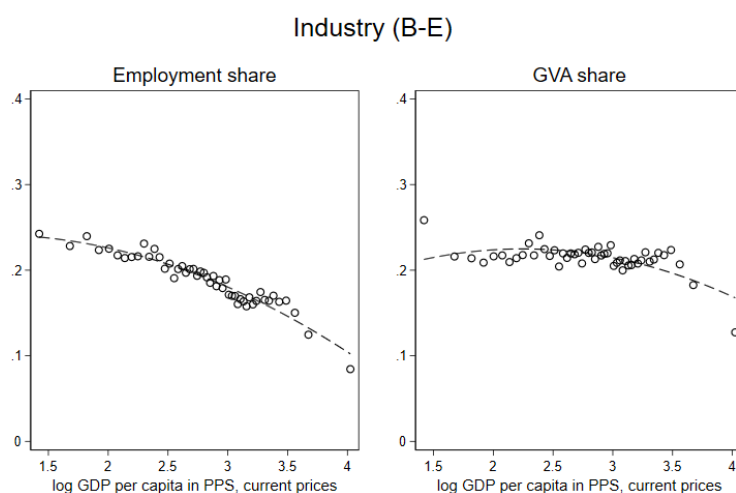
[9] The dots display mean values within 50 bins each covering 2 percent of the observations. Dotted lines give the quadratic fit across all observations.

Finally, Figure 7 shows how financial and business services capture an increasingly larger share of employment and GVA as regions develop. Nearly 40 percent of value added in the economy and 30 percent of employment relies on this sector for the richest regions in Europe. The discrepancy between the economic weight of these activities and their ability to generate employment, however, is noteworthy. An incipient literature has also started to look at the role of financialization on regional income disparities (Feldman, Guy, & Iammarino, 2019).[10]

Figure 7: Binned scatterplots relating shares of employment and GVA to development
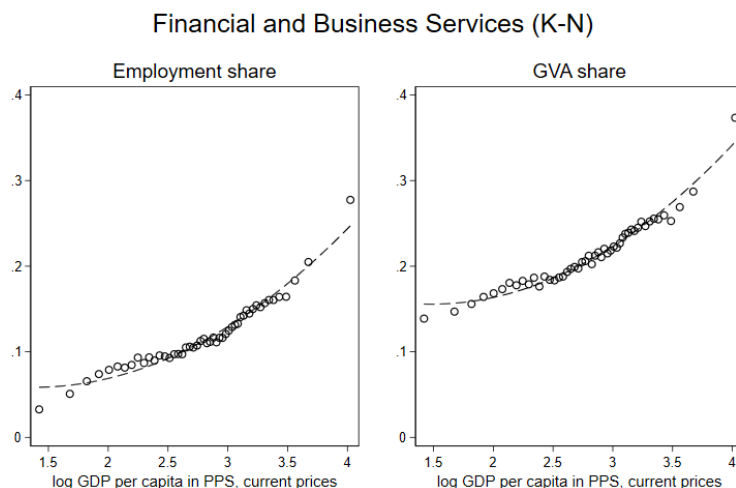
The picture emerging from the above-described figures is consistent with two aggregate facts about the changing economic structure of the EU economy.

- First, Figure 8 shows that over time **EU regions have been steadily shedding jobs in agriculture, industry, and construction, in favour of the service sector** (whether financial, non-financial, or non-market services).[11] It is precisely this structural transformation that poses challenges for many middle-income regions.

Figure 8: Changes in average shares of employment in the EU by sector

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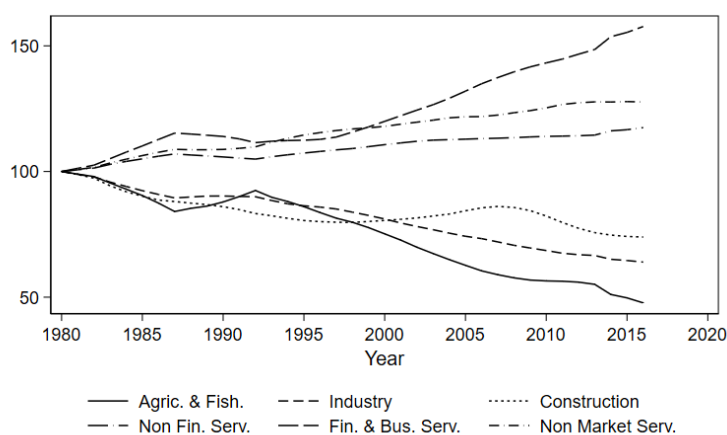
[10] The study associates financialization – the power of the financial sector over both firms which are receiving financing and firms which are paying cash out – with the strength of spatially concentrated monopolies at the expense of other places and industries.
[11] The Figure indexes all shares to be equal to 100 at the beginning of the time series in 1980 to emphasise changes over time within each share (rather than across shares).

- Secondly, **while nominal GDP per capita and GVA per capita or per worker have been growing steadily since the 1980s, aggregate employment creation or employment rates have stagnated** (Figure 9). This suggests that large part of GDP per capita growth comes from labour productivity growth.

Figure 9: Average annual growth in European aggregates over the longest available time series

Note: Excludes observations outside upper and lower adjacent values, represented by the whiskers.
For a definition, see Tukey, J. W. 1977. Exploratory Data Analysis. Reading, MA: Addison–Wesley.
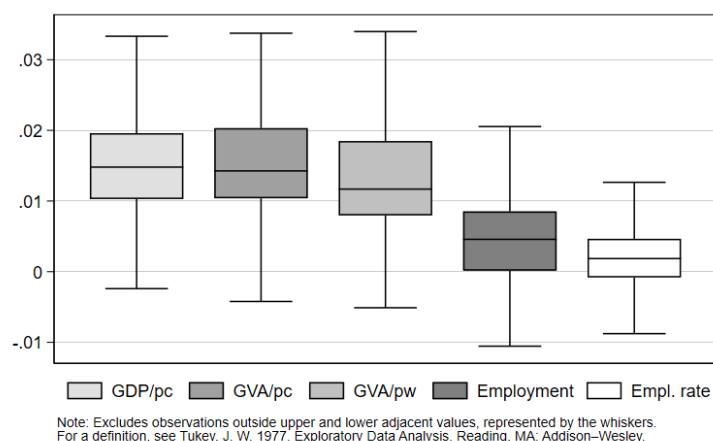
The struggle of some regional economies to create new jobs confronted with a changing economic landscape is corroborated by previous analyses at subnational level. In particular, Blanchard, Katz, Hall, & Eichengreen (1992) describe using US data describe how localised shocks can have permanent effects on employment, leading to distinct geographical patterns of job creation. Martin & Tyler (2000) document a similar pattern for European regions, whilst Dunford & Smith (2009) point to substantial regional variation in the speed and direction of change in income per capita, productivity and employment rates, with divergence and convergence occurring simultaneously as a result of greater economic integration. With respect to structural transformation, Sassi (2011) examines the role of sectoral composition and structural change in convergence across a sample of European regions between 1995 and 2006. The author uncovers that, considering sectoral differences, convergence appears to take place at different speeds in different sub-groups of regions. In her own words: "This pattern hardly conforms with the Solow model hypothesis and suggests, instead, that some process linked to geographical spillovers and low trap equilibrium phenomena might be at work, as prescribed by the economic geography and the new endogenous growth theory, an aspect that deserves a more specific investigation" (Sassi, 2011, p. 113). Additional insight is offered by recent evolutionary economic geography contributions to the post-crisis debate (see, at the national level, Filippetti & Archibugi, 2011). Looking at regional resilience in Europe through the lens of industrial dynamics (i.e., how regions have been capable of developing new industries), several studies have shown that relatedness, or technological complementarity, is a vital driving force behind local diversification and structural change (Boschma, 2015; Fingleton, Garretsen, & Martin, 2012). This is confirmed by a number of empirical studies on regions across different EU Member States (Boschma & Iammarino, 2009; Boschma, Minondo, & Navarro, 2013). Path dependence appears as a fundamental element for many middle-income regions specialised in declining and/or offshoring industries (Martin & Sunley, 2006).

Total Factor Productivity

The national-level literature reviewed in Section 2.1.2 also discusses the prominent role played by total factor productivity. In the case of TFP, researchers have highlighted that growth in low-income countries generally results from capital accumulation. Initially low stocks of initial capital lead to high economic returns to capital. These dividends become nevertheless exhausted in middle-income countries,

as increases in capital stocks no longer result in higher returns and the economies need to rely on increasing efficiency, that is, on increasing TFP. Do these results also hold at the regional level in the EU? In comparable growth accounting exercises to the ones described at the national level, Aiello & Scoppa (2000) and Scoppa (2007) examine the determinants of differences in output between Italian regions, confirming TFP to be a fundamental driver of disparities in performance. Moreover, Aiello & Scoppa (2000) also highlight the relevance of infrastructure and the financial system to determining TFP, along with state intervention and the enforcement of property rights. The importance of infrastructure is also noted by Michaels (2008), who relates the presence of interstate highways to increased demand for skilled labour in US counties. Scoppa (2007), instead, emphasises the importance of human capital quality, which also aligns with national-level findings. The role of human capital and skills is highlighted by in the work of Duranton & Monastiriotis (2002), who discuss trends in regional earning inequalities in the UK between 1982 and 1997, ascribing large part of the emerging gap between the north and the south to educational differences in the workforce, combined with differential returns to skills.[12] In a similar fashion, Combes, Duranton, & Gobillon (2008) stress the importance of spatial sorting of workers by levels of skills in explaining territorial wage disparities, especially with respect to urban areas. This finding is partly confirmed by D'Costa & Overman (2014) using a large panel of British workers. A key question related to these findings is what drives workers with higher skills toward certain places rather than others. Innovation is also found to be a driver of spatial disparities by Lee & Rodríguez-Pose (2013). Other scholars have also highlighted that national and regional differences in TFP in Europe can be explained by the endowment of a wider set of intangible assets than the classical physical, human, and technological capital, including competencies (van Ark, Hao, Corrado, & Hulten, 2009), social capital (Beugelsdijk & Van Schaik, 2005; Dettori, Marrocu, & Paci, 2012; Iyer, Kitson, & Toh, 2005; Malecki, 2012), and global production networks (Castellani & Pieri, 2013). Some of these effects operate indirectly. Social capital, for instance, is found to increase innovation capacity (Crescenzi, Gagliardi, & Percoco, 2013; de Dominicis, Florax, & de Groot, 2013) as well as financial development (Guiso, Sapienza, & Zingales, 2004), among others. In addition, a rich literature in urban economics documents the importance of agglomeration and densely populated environments in increasing the productivity of firms and workers thanks to the mechanisms of sharing, matching and learning (De la Roca & Puga, 2017; Duranton & Puga, 2004; Puga, 2010). Antonelli, Patrucco, & Quatraro (2011) and de Dominicis (2014) provide an application of these findings to the case of productivity and growth in European regions, although the latter study finds that agglomeration seems to matter mostly for the less developed regions of Europe.

Institutional Quality

Finally, there is a growing literature at subnational level that validates and integrates country-level findings that institutional quality is vital for promoting sustainable economic growth even at middle-income levels. The conceptual underpinnings for the relevance of institutions on regional development are discussed in Rodríguez-Pose & Storper (2006) and Storper (2005), who look at the role of society and community as complementary organisational forms that contribute to determine the long term development trajectories of a territory. In their definition, 'society' refers to institutions determined by transparent and codified rules, while 'community' includes soft factors related to group life such as social norms, values, beliefs, or conventions generally embedded in interpersonal networks. Farole, Rodríguez-Pose, & Storper (2011) revisit this discussion by emphasising the importance of both national and subnational institutions, whether formal or informal, to geographical analyses. More

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[12] See Davis & Dingel (2019) for a recent theoretical contribution modelling the emergence of skill premia in cities due to the costly acquisition of ideas as a force driving agglomeration externalities in a spatial equilibrium setting.

recently, Storper (2018) discusses how institutions can lead to economic polarisation via their impact on agglomeration, migration and sorting, skill-formation, and socialisation. Empirically, Tabellini (2010) documents the importance of culture (values and beliefs) on the economic development of European regions using a historical instrument as a source of exogenous variation in contemporary institutions to identify their effects. Rodríguez-Pose & Garcilazo (2015) discuss the importance of local government quality across a panel of European regions between 1996 and 2007 both directly, on aggregate growth, and indirectly, via the increased efficiency of public development funding. Similarly, Crescenzi, Di Cataldo, & Rodríguez-Pose (2016) show that the quality of local government institutions can determine the economic returns to investments in transport infrastructure across Europe. A recent analysis by Boeri, Ichino, Moretti, & Posch (2019) links differences in collective wage bargaining agreements between Germany and Italy to spatial disparities in non-employment and purchasing power. With respect to structural transformation, institutional change is required to accommodate the development of new industries and economic activities (R. Boschma & Frenken, 2009; Perez & Freeman, 1988). Importantly, institutions can affect the economic performance of places even in the very long run. Dell (2010), for instance, shows that areas exposed to extractive institutional practices in Peru between the 16th and 18th century remain underdeveloped today, featuring lower household consumption and poor health outcomes mediated by deficient public good provision and lower land tenure rates. Acemoglu, Cantoni, Johnson, & Robinson (2011) discuss the impact of institutional changes linked to the French Revolution on subsequent economic growth in French-occupied regions in Germany. Becker, Boeckh, Hainz, & Woessmann (2016) link contemporary trust in local public services as well as corruption in the judicial and the police to the administrative tradition of the Habsburg Empire. Institutional settings can at times thus be relatively rigid. Rather than leading to deterministic views of development, however, institutions should be taken into account by policymakers when defining regional development strategies (Rodríguez-Pose, 2013). Therefore, the identification of both the institutional structures under which regions are more likely to adapt, integrate internationally and seize opportunities provided by new sectors, and the conditions under which institutional adaptation instead fails to materialize, is crucial (Amin, 1999; R. Boschma & Frenken, 2009; Hassink, 2010; Maskell & Malmberg, 2007; Morgan, 1997), especially as the core of the problem in middle-income regions may accrue from institutional quality and/or lock-in rather than endowment shortages.

3 METHODOLOGICAL DISCUSSION

This Section integrates the literature review conducted in Section 2 by surveying the approaches to the identification of growth slowdowns, development dynamics, and middle-income traps used in the relevant scholarship and outlining advantages or disadvantages. It then builds on this information to propose a methodology suitable to identify development traps at regional level as well as regions at risk of being trapped.

3.1 Review of Existing Approaches

As discussed in the previous Sections, one of the key challenges for the identification of development traps, whether or not at middle-income levels, is to distinguish these from alternative theoretical explanations of growth dynamics, and notably convergence. Indeed, slow (or absent) convergence and traps can be largely equivalent from an observational viewpoint, especially with respect to conditional or 'club' convergence (on this point, see also Boldrin & Canova, 2001). Unfortunately, empirically disentangling these two concepts can be very hard. In fact, some of the tools traditionally used for studying convergence clubs and polarisation can also be applied to the empirical identification of middle-income traps, albeit with a different

theoretical interpretation. See Durlauf, Johnson, & Temple, (2005) for an exhaustive discussion of the methodological literature on convergence, limiting what follows to approaches that compete with methodologies adopted by the scholarship on middle-income traps. It is also important to be aware of the important methodological decision regarding the definition of middle-income levels, whether in absolute or relative terms (see Section 2.1.1 for details). Loosely following the classification of Breinlich et al. (2014), the relevant methods can be divided in:

- Time-series approaches,
- Distribution dynamics,
- Multiple regimes and mixture densities, and
- 'Rule of thumb' (Aiyar et al., 2013) approaches.

3.1.1 Time-Series Approaches

Time-series approaches address limitations in the cross-sectional methods typically used in beta-convergence studies (Durlauf, Kourtellos, & Tan, 2008). They draw on time-series properties to develop formal statistical tests of a well-defined convergence hypothesis. As such, these approaches have the merit and strength of statistical testing. On the other hand, their disadvantage is that they are not tied to any foundational theory of growth. Seminal contributions to this work are offered by Bernard & Durlauf (1995, 1996) and Carlino & Mills (1993). The methodology relies on the notion of stochastic convergence and applies unit-root tests to the variable of interest (e.g., per capita income or disparities in per capita income) to determine whether the process is stationary, trend-stationary, or non-stationary. A stationary process features a mean that is constant over time. A trend-stationary process is mean-reverting, implying that any shock is transitory and that the series converges back to the (evolving) mean of the trend. By contrast, non-stationarity (i.e., a unit root) implies that shocks have permanent effects. To test whether two economies are diverging, for instance, a researcher can perform a unit root test on their output gap to assess whether the null hypothesis of a stochastic process (suggesting divergence) can be rejected, against the alternative of trend-stationarity (suggesting that the economies will eventually converge again). Pesaran (2007) generalises this test for output gaps between all possible pair-wise combinations of observations, requiring stationarity in each gap but not in the time-series of individual economies, which can feature non-stationary processes. Moreover, this approach does not require the definition of a reference value to compute each gap. Le Pen, (2011) applies this methodology to the case of European regions over the 1980-2006 period, finding limited evidence for standard definitions of convergence (e.g., level- or trend-stationarity of the gaps), suggesting that shocks causing gaps in regional outputs can have permanent effects. This methodology can be adapted to consider clusters of spatial units, which allows to study club convergence patterns (Hobijn & Franses, 2000; Monfort, Cuestas, & Ordóñez, 2013). Also relying on time-series approaches is the work of Ben-David & Papell (1998), who develop a test for identifying the existence and timing of growth slowdowns using yearly data and endogenously determined breaks, irrespective of whether the time-series presents a unit root. More recently, Ye & Robertson (2016) draw on time-series properties such as stochastic trends and structural breaks to propose a test for identifying middle-income trap economies. However, their approach requires an ex-ante definition of what constitutes a middle-income economy (in their case, the middle 40 percent economies ranked by per capita income), to which results can be sensitive.

Overall, these solutions are appealing for their methodological rigour. However, with respect to this project, an important limitation is their lack of a theoretical link with the concept of middle-income traps, other than through the notion of club convergence when cluster methods are used (with the exception of Ye & Robertson, 2016). These methods also feature relatively inflexible assumptions regarding the underlying growth process, such as that the behaviour of the units in the sample

mimics that of near-steady state conditions (Bernard & Durlauf, 1996), or time-invariance of relative steady-states over the long run (Breinlich et al., 2014). Moreover, their difficult interpretation (especially when allowing for breaks in the series) and complex implementation can conceal important facts about the economies under study that are more intuitively recovered using alternative methods.

3.1.2 Distribution Dynamics

The distribution dynamics approach is grounded on the notion of sigma-convergence, which is defined as a reduction in the dispersion of income levels or growth rates in the cross-section of available observations. It is mainly associated with the work of Quah (1993, 1996b, 1996a, 1997). The key feature of this approach is to focus on the dynamic of transitions of economies across classes of income resulting from an appropriate discretisation of the distribution.[13] In other words, distribution dynamics look at the probability that a country or region belonging to a class in the distribution (e.g., middle-income) moves to a different class over time. Accordingly, a transition matrix is estimated, which captures these probabilities. Under the assumption that the transition matrix does not change over time, it is possible to predict a stationary distribution that represents the expected long-run realisation of incomes. Applied to the study of convergence across countries, this method has revealed the emergence of a `twin-peaked' distribution, consistent with the notion of convergence clubs (Quah, 1996b, 1997). In the case of European regions, it reveals the importance of geographical forces in determining the performance of local economies and the existence of spatial clusters of convergence (Quah, 1996a). Fiaschi & Lavezzi (2003) adapt this method to study transitions in a state space that captures the joint distribution of income levels as well as growth rates. The authors found strong non-linearities in the growth process that are consistent with the existence of multiple equilibria and development traps.

Overall, these approaches are appealing for the study of polarisation dynamics and for presenting descriptive facts about the shape of the distribution of incomes and its changes over time. By focusing on the entire distribution, they also allow to consider the complex interaction between regional economies, which traditional regression-based methods fail to do. However, these approaches are often silent about the dynamic of individual economies. Moreover, the assumption of stability in the transition matrix is strong and undermines the ability to make inferences over the long term. In addition, results are sensitive to the way the cross-sectional distribution is discretised (i.e., how each class is defined).

3.1.3 Multiple Regimes

The study of multiple regimes directly addresses the possibility that convergence might occur within distinct 'clubs', as documented by several theoretical and empirical papers including those on polarisation. A common denominator of this class of methods is the agreement that standard linear models are unable to describe the growth processes of heterogeneous economies. The aim of these approaches is not only to detect the existence of clubs, but also to determine their membership. To this end, a range of different strategies are used including: classification and regression tree analysis (CAST), as in the study by Durlauf & Johnson (1995); generalized, unbiased interaction detection and estimation (GUIDE), for instance by Tan (2010); mixture densities (Paap & van Dijk, 1998); projection-pursuit methods (Desdoigts, 1999); or other clustering or `bump hunting' techniques. In all these cases, the researcher attempts to define groups of countries or regions for whom the same parametric approximation of the growth process is suitable (in other words, for which

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[13] Please note that this method has also been extended to take into account continuous distributions (Quah, 1997).

the same growth model holds, given a set of parameter values). Of particular interest among these approaches is the work of Canova (2004), who develops a Bayesian mixture density approach suitable for panel data. Canova's solution involves estimating regression models that allow for heterogeneous parameters across groups of an a priori unknown number and composition. Moreover, the parameters are allowed to vary between observations within the same group, as long as they display the same distribution. The distribution of the coefficients of units in multiple groups, instead, can be different. Having set ex ante dimensions for group definition (e.g., levels of per capita income), a Bayesian routine determines group thresholds and memberships so as to maximise the predictive power of the overall model. The author applies this method to income per capita observed for a panel of European regions. His findings show that there is marked heterogeneity in growth trajectories, and a clustering of observations into four groups each characterised by statistically different mean steady state values. This is interpreted as evidence for the existence of convergence clubs but also offers insight into the possibility of middle-income traps due to the low inter-group mobility, especially for initially poorer regions.

Importantly, a limitation shared by all these approaches is the inability to draw conclusions from the evidence of multiple growth regimes regarding the origin of this heterogeneity: whether it is non-linearities in the growth trajectory, or multiple equilibria (Durlauf & Johnson, 1995). Moreover, they require making assumptions about the accuracy of simple regression specifications in capturing the relationships of interest. This must be ruled out in the presence of general equilibrium effects, as seems likely when working with regions (Breinlich et al., 2014).

3.1.4 Rule of Thumb Approaches and Other Methods

Many of the approaches adopted by the literature explicitly focussing on middle-income traps rely on more intuitive, ad-hoc, definitions of the identifying criteria. One of the key contributions in this respect is that of Hausmann, Pritchett, & Rodrik (2005), who focus on *accelerations* in growth rates, rather than in growth rates themselves. This allows relaxing assumptions regarding the underlying model of growth and its appropriateness to describe economies potentially in very different states. Importantly, the authors emphasise that studying accelerations allows for non-linearities in growth trajectories characteristic of development traps. Instead of imposing a unique model to the data, therefore, the authors first identify episodes of accelerations in growth rates, and subsequently study their determinants in a flexible setting. Let $g_{t,t+n}$ denote the growth rate in output per capita y of an economy at time t over the period n. Growth acceleration is defined as the change in the rate $\Delta g_{t,n} = g_{t,t+n} - g_{t-n,t}$ that satisfies the following filtering conditions:

(1) $g_{t,t+n} \geq 0.035$, i.e. the economy grows rapidly;

(2) $\Delta g_{t,n} \geq 0.02$, i.e. growth is accelerating;

(3) $y_{t+n} \geq \max y_i, i \leq t$, i.e. post-growth output exceeds pre-acceleration peak.

where $n = 7$, meaning that an eight-year window is considered. In other words, an economy experiences an acceleration in its growth rate if it is growing rapidly, its growth rate increases by a sufficiently large amount over the previous period, and this process sets the economy at a higher per capita income level than it started. Suitably re-interpreted, this method can be adapted to study recessions, slowdowns and episodes of stagnation. Hausmann, Rodriguez, & Wagner (2006), for instance, study growth *collapses*, rather than accelerations, using a comparable approach. They subsequently use survival analysis techniques to study the determinants of the duration of such episodes. Eichengreen et al. (2012) instead focus on slowdowns in successfully developing economies, thus researching a setting comparable to that of middle-income trapped economies. Their identifying conditions are as follows:

(1) $g_{t-n,t} \geq 0.035$, i.e. the economy was growing rapidly before t;

(2) $\Delta g_{t,n} \leq 0.02$, i.e. growth is decelerating;

(3) $y_t = USD\ 10,000$, i.e. the economy is middle-income (absolute definition).

The time-window they consider is also eight-years. When consecutive years are identified as slowdowns (e.g., Greece between 1969 and 1978), a Chow test is used to isolate structural breaks in the series (using the year for which the test yields highest significance). The same method is used by the authors in a follow up study that identifies multi-modal levels of income at which slowdowns can occur, with modes at around USD 11,000 and USD 15,000 (Eichengreen et al., 2014).

Aiyar et al. (2013) propose a different approach, which is grounded in neoclassical growth theory. They define slowdowns as an abrupt, large, and sustained deviation from the growth trajectory that an economy is expected to follow given its fundamentals. Operationally, per capita income growth is regressed on lagged income levels and measures of physical and human capital. Negative deviations of the observed growth rates from the predicted values suggest the economy is performing poorer than it could. A slowdown is then identified if economies experience deviations falling in the bottom quintile of the distribution over a five-year and a ten-year period starting at $t-1$, that is, between $t-1$ and t and between $t-1$ and $t+1$ respectively. The two-period condition is set to ensure the slowdown is sustained in time. The merit of this methodology lies in its strong links to theory, which allow it to capture slowdowns that take into account the natural convergence path of an economy (at least with respect to physical and human capital and initial levels of development), as well as transitory shocks. Another advantage, and a key difference with respect to Eichengreen et al. (2012, 2014), is that their methodology does not require ex-ante definitions of income levels. Hence, the authors can test the claim of middle-income traps by observing the frequency of slowdown episodes conditional on a range of possible threshold values for definitions of middle-income levels. Encouragingly, the results suggest that growth slowdowns are indeed more likely to affect middle-income economies irrespective of how the thresholds are set (within reasonable levels).

These approaches have the advantage of offering a flexible and intuitive way of identifying middle-income traps. They can also feature strong links with theory. On the other hand, they are potentially liable to somewhat arbitrary ex-ante definitions of middle-income categories, which warrants careful consideration of how thresholds are set, as well as thorough robustness checks.

3.2 Identifying Development Traps in EU Regions

Considering what discussed above, what follows is the proposed strategy for identifying DT regions in the EU (and regions at risk of being trapped). As discussed in Section 2.2.2, a more comprehensive notion of 'development trap' is used, rather than 'middle-income trap'. Using the proposed measurement strategy, Section 3.2.3 will provide some quantitative evidence in support of this new conceptualisation.

3.2.1 Definitions and Measurement

Two concerns emerge with respect to readily developed methods.

- Firstly, with few exceptions, past approaches either to convergence or middle-income traps rely almost exclusively on per capita income as an outcome for determining development traps.

- Secondly, they tend to present dichotomous definitions of slowdowns or traps as states in which an economy either is or is not.

Conversely, the literature review suggests that middle-income traps are more complex phenomena than just slowdowns in growth rates, especially at subnational level. Importantly, the risk of falling into a development trap at middle-income levels could also be associated to other factors, such as low growth in employment or declining industry shares in local economies. Moreover, with an eye to increasing the relevance of this notion for policy purposes, one of the key issues is determining an ex-ante *continuous* measure of risk for each observation, rather than just a dichotomous variable capturing trapped-status. **This would allow studying the intensity, rather than just the existence of this phenomenon**, as well as the exposure of individual regions to development trap risks at any given point in time. One possibility to reconcile dichotomous measures of development traps with continuous ones that capture intensity and risk would be to regress the dichotomous development trap status (zero or one) onto a set of relevant covariates to obtain parameters that capture the strength of association of that covariate with the probability of a development trap. To determine the risk factor (the probability of being in a trap), one could then use these estimated parameters to make predictions on regions at different points in time. This however requires a structural interpretation of the empirical model, which, in turn, entails strong assumptions. Moreover, the model is susceptible to bias arising from a priori decisions regarding the factors that would or would not matter.

For all these reasons, it is preferred to directly measure development traps along a continuum that takes into account the multi-dimensionality of this concept. Of course, this does not prevent from subsequently studying the factors that are associated with greater risk of being trapped in a more flexible setting that does not require interpreting the model structurally.

Based on the theoretical definitions of middle-income and development traps discussed in the literature, three variables are considered:

1. GDP per capita at constant 2005 prices;

2. Total GVA per worker (productivity) at constant 2005 prices;

3. Employment to population ratio.

Each variable is defined at NUTS2 level (EU and UK) using panel data based on Eurostat figures and the Cambridge Econometrics Regional Database. The series is consistently available for nearly all regions since the early 1990s, dating back as far as 1980 for over 75 percent of NUTS2 regions in Europe (mainly for the first 15 member-states of the EU – EU15). Following the approach of Eichengreen et al. (2012, 2014) and Hausmann et al. (2005, 2006), this report focuses on change, taking the accelerations in growth rates of these variables as our proxy for change. Two similar alternative measures of development trap are explored. One, simpler, is based on a set of dummies capturing relative performance of a region compared to three benchmarks (acceleration or deviation), along all three variables listed above. The second, perhaps more nuanced, considers the degree of acceleration or deviation from the performance benchmark, rather than just dummies. This however could potentially make it more sensitive to outliers. What follows clarifies the proposed strategy.

Let the average compound yearly growth rate in a variable of interest y in region i at time t over the period n be:

$$g_{i,t,t-n} = n^{-1} \times \ln \frac{y_{i,t}}{y_{i,t-n}}$$

Growth acceleration is given by:

$$a_{i,t}^R = g_{i,t,t-n} - g_{i,t-n,t-2n}$$

Period length is set at $n = 5$ in line with the literature to cover a sufficiently long time window (Aiyar et al., 2013). Effectively, this means that each acceleration at time t considers a time window spanning over the previous 10 years.

Next, the following two deviations of growth rates are defined:[14]

1. Deviation from the Member State (i.e. country) the region belongs to:

$$a_{i,t}^{MS} = g_{i,t,t-n} - g_{t,t-n}^{MS}, \text{ with } i \in MS$$

2. Deviation from the EU average:

$$a_{i,t}^{EU} = g_{i,t,t-n} - g_{t,t-n}^{EU}$$

Respectively capturing the differences in growth rates of variable y in region i from those of the Member State the region belongs to, as well as from the EU average over the same period n at time t. Note that we compute the former deviation only if the Member State has more than one region at the NUTS2 level. Next, we define the dummies $D_{i,t}^{y,R}$, $D_{i,t}^{y,MS}$, and $D_{i,t}^{y,EU}$ as indicator variables taking the value of one if the accelerations are positive, and zero otherwise. This yields six or nine different dummies: two or three for each acceleration (depending on whether a region belongs to a Member State with one or more than one NUTS2 units), for all three variables y.

A first measure of risk of falling into a development trap is defined as:

$$DT_{1,i,t} = \begin{cases} 1 - \dfrac{\sum_y D_{i,t}^{y,R} + \sum_y D_{i,t}^{y,MS} + \sum_y D_{i,t}^{y,EU}}{9}, & \textit{if NUTS2 in MS} \geq 2 \\[2em] 1 - \dfrac{\sum_y D_{i,t}^{y,R} + \sum_y D_{i,t}^{y,EU}}{6}, & \textit{if NUTS2 in MS} = 1 \end{cases}$$

This measure is bounded between 0 and 1, with greater values denoting a greater risk of being trapped in a given year t.

As an alternative specification, we consider the average of each acceleration rather than using dummies, where on the numerator each acceleration is simply added-up together (accelerations are dimensionless and thus directly comparable). The resulting index is then standardised across the entire period using the mean and standard deviations of the 1990 distribution (the first year in the series).[15] We also multiply the index by negative one so that higher values are associated to greater risk. More formally, we compute:

$$DT_{2,i,t} = \begin{cases} -1 \times \dfrac{[(\sum_y a_{i,t}^{y,R} + \sum_y a_{i,t}^{y,MS} + \sum_y a_{i,t}^{y,EU}) \times 9^{-1}] - \mu_{1990}^{Raw\,DT2}}{\sigma_{1990}^{DT2}}, & \textit{if NUTS2 in MS} \geq 2 \\[2em] -1 \times \dfrac{[(\sum_y a_{i,t}^{y,R} + \sum_y a_{i,t}^{y,EU}) \times 6^{-1}] - \mu_{1990}^{Raw\,DT2}}{\sigma_{1990}^{DT2}}, & \textit{if NUTS2 in MS} = 1 \end{cases}$$

Where $Raw\,DT2$ denotes the un-standardised values of this measure (the part between squared brackets in the above formula). **This alternative measure is qualitatively comparable to the first one, but takes into account the magnitude of accelerations, thus providing more variation.** Both measures are constructed for each (available) region and year from 1990 to 2015. Note that in selected instances we group together smaller urban regions into a unique compact urban area, to take into account the functional integration of these areas. This follows the methodology

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[14] In what follows, we refer to these as accelerations as well, rather than deviations, to simplify terminology.
[15] As recommended by Nardo et al. (2008) when the researcher is interested in changes over time rather than just comparing units in the cross-section.

adopted for the creation of the EU Regional Competitiveness Index. Table 8 in Appendix provides details on the crosswalk we used.

We believe that these measures have several strengths.

- **First,** the fact that we do not condition this index on past growth performance (unlike Eichengreen et al., 2012, 2014, and Hausmann et al., 2005, 2006) allows to capture poorly performing regions approaching stagnation from different growth trajectories. This is important because, as discussed in Section 2.2.2, regions in the middle-income ranges of development are a very heterogeneous group with potentially different past economic trajectories.

- **Second**, by looking at employment and productivity, in addition to per capita GDP, we allow a trap to be defined in a more nuanced way than by simply looking at income. This aligns with the regional-level literature.

- **Third,** partly following Quah (1996a), we consider relative deviations not only from a region's past performance, but also from those of the hosting Member State and of the EU. Defining accelerations this way allows to take into account shocks that are common to all regions in the host country, or that affect the EU as a whole. Examples of the former include changes in national policies, different timings of the enlargement process, as well as more generally state-specific effects. An example of the latter is the Great Recession that hit all European economies in 2008, with few exceptions.[16] We emphasise the importance of including deviations from the national and EU performance to ensure the resulting measure captures as much as possible variation that is specific to the region itself. Failing to do so could potentially skew results for all regions, particularly with respect to Member States that have tended to underperform across all their territories.

- **Fourth,** departing from Eichengreen et al. (2012, 2014), the measures we propose are agnostic with respect to the income-level at which European regions might become trapped. This allows us to define this measure more broadly as one capturing development traps. Importantly, this also allows to test the validity of the middle-income trap claim by studying the joint distribution of DT_1 or DT_2 with respect to initial levels of development (similarly to what done by Aiyar et al., 2013).

In conclusion, we believe that this strategy offers an intuitive *dynamic* conceptualisation of the development trap, giving policymakers a year-by-year tool to assess the degree and historical evolution of the risk of being trapped. For this reason, we also believe that the dynamic definition of development trap is preferable to static measures that limit themselves to taking a snapshot of regional performance over ex-ante defined periods. The proposed measures were also tested against alternative definitions in order to validate the merits of this methodology and evaluate the robustness of their results.

3.2.2 Descriptive Findings and Stylised Facts

What follows offers an overview of the resulting measures. Table 1 presents summary statistics for the proposed risk measures for selected years as well as over the entire available period. On average, both measures tended to increase between 1990 and 2010, falling slightly in the post-crisis period but settling at higher levels in 2015 than they were in 1990. The same finding holds if median values are considered, suggesting that this trend is not driven by outliers.

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[16] Of course, the Great Recession also affected different countries in different ways. This is captured by differencing with respect to the hosting Member State.

Table 1: Summary statistics of the proposed risk measures

	DT1					DT2				
	1990	2000	2010	2015	Total	1990	2000	2010	2015	Total
Mean	0.35	0.43	0.59	0.51	0.52	0	0.52	1.17	0.89	0.86
Std. Dev.	0.20	0.23	0.28	0.25	0.26	1	1.01	0.73	0.71	0.97
Min	0	0	0	0	0	-3.87	-7.41	-1.14	-1.95	-12.00
P25	0.22	0.22	0.33	0.33	0.33	-0.45	0.21	0.68	0.61	0.39
P50	0.33	0.44	0.61	0.56	0.56	-0.01	0.65	1.22	0.91	0.91
P75	0.44	0.56	0.78	0.67	0.67	0.34	0.98	1.66	1.31	1.37
Max	1	1	1	1	1	7.2	3.34	3.01	2.99	11.64
Obs.	198	245	264	264	6159	198	245	264	264	6159

Table 2 reports the number of regions (and shares of total regions) in selected years falling into different percentage groups for the two proposed measures of DT. The scores for each region in each year are computed using the distribution over the entire available series between 1990 and 2015. This means that in each year, regions with scores in the top 25% experienced a risk that was higher than the one experienced by 75% of all regions over the entire period under consideration. The same logic applies to the other three groups.

Table 2 suggests that between 1990 and 2010, a growing number of regions was exposed to the highest levels of risk. This is true for both measures. In 1990, just under 5% of all regions were exposed to the highest risk of being in a development trap, according to the DT_1. By 2010, at the height of the crisis, the regions in this category jumped to nearly 40% of the total. Since then, the number of regions at the highest risk of DT has been falling, and by 2015 just over 20% of EU regions fell within this group. Figure 33 in Appendix presents a detailed time-series view of trends in the top risk category for both measures.

Table 2: Counts and shares of EU regions by risk of falling in a DT (1990-2015)

		DT1					DT2				
Risk level (0-100)		0-25	25-50	50-75	75-100	Total nr. regions	0-25	25-50	50-75	75-100	Total nr. regions
1990	Nr. regions	110	69	10	9	198	152	31	8	7	198
	%	56	37	13	5		77	16	4	4	
2000	Nr. regions	109	85	21	30	245	86	86	51	22	245
	%	44	35	9	12		35	35	21	9	
2010	Nr. regions	67	65	34	98	264	38	50	71	105	264
	%	25	25	13	37		14	19	27	40	
2015	Nr. regions	87	81	40	56	264	42	92	71	59	264
	%	33	31	15	21		16	35	27	22	

Table 2 also shows that despite the trends on the high end of risk scores, the bulk of the regions in each year had risk levels below the 1990-2015 median value. Only in 2010 did less than half of EU regions experience risk levels below the 1990-2015 median. Overall, this suggests that the risk of falling into a middle-income trap is limited to a restricted number of regions. Identifying these regions is one of the key tasks of this project.

With this in mind, Figure 10 shows the geographical distribution of the average risk over the entire period of analysis, broken down by average risk scores for the whole period of analysis. Despite some discrepancies, both indicators draw a consistent picture. Considering the period average, the risk of falling into a middle-income trap appears greatest among Southern and South-eastern European regions (especially in Greece and Italy), as well as in some selected rural and old industrial regions in Western Europe (especially in France) and in the Nordics. Table 9 in the Appendix provides a list of the top 25 ranked regions by this average risk level. Note that we limit the period of analysis to 2015 due to limited data availability for 2016 at the time of the writing of the report. Moreover, information on some regions especially in Central and Eastern Europe is not available until 1990/91, allowing us to compute the DT measures only from 2000/01 onward (see Footnote 8 for a detailed list). For these regions, averages are taken over the longest available period. For comparison, Figure 11 also provides averages taken over the 2001-2015 period, which is the one that will be considered in the econometric analysis. Over this period, all except six NUTS2 regions were available.[17] Figure 34 in the Appendix offers the same maps with averages taken over 2008-2015.

Figure 10: Average risk of being trapped in the EU, quartiles of the distribution over 1990-2015

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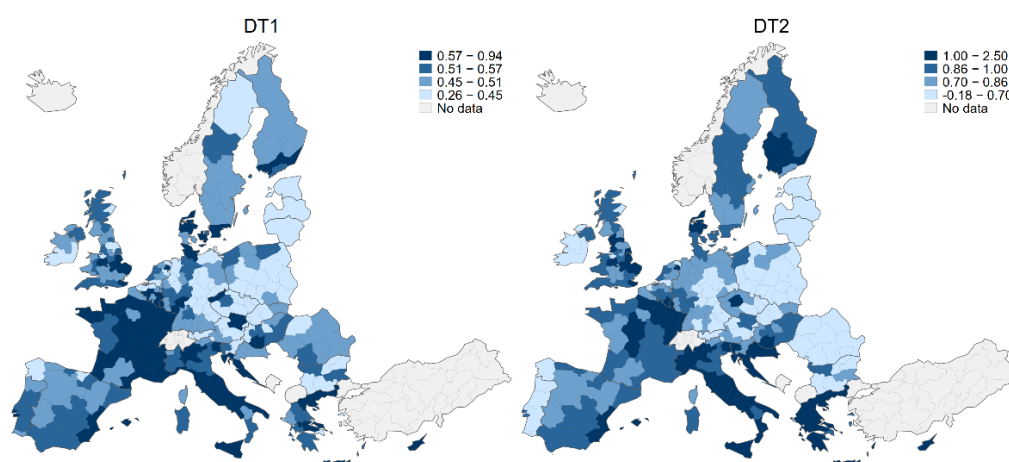
[17] Not available consistently are regions in Luxembourg, Croatia and Cyprus. Latvia and Lithuania are available from 2002, so averages of regions in these countries can be considered representative for the period. An additional concern considered the possibility that averaging over this period would give excessive weight to crisis years due to the way the proposed measures were constructed. In results not presented herein, alternative descriptive maps were produced that took averages over non-overlapping year intervals, with no substantial differences.

Figure 11: Average risk of being trapped in the EU, quartiles of the distribution over 2001-2015
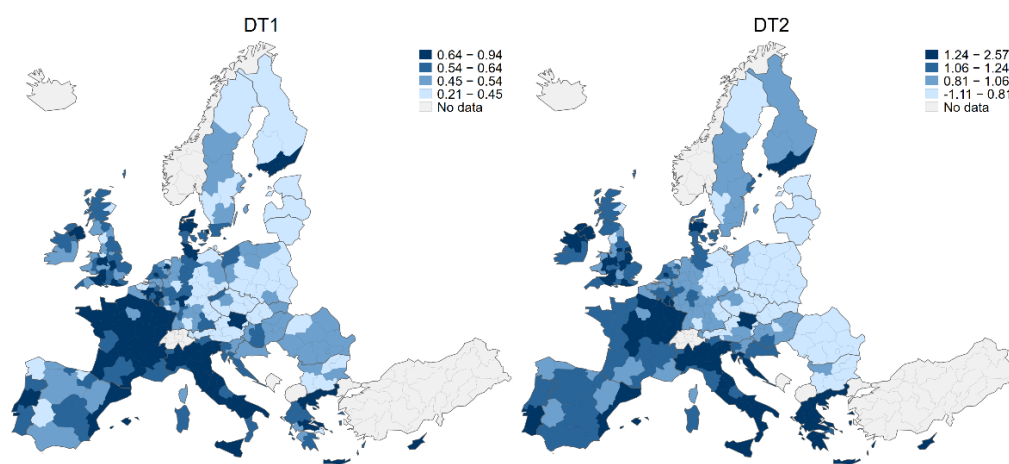
Moreover, Figures Figure 35 to Figure 40 in Appendix show the geographical distribution of subcomponents of the proposed measures, that is, average scores over 1990-2015 computed separately for income per capita, productivity and employment to population, as well as separate scores for regional accelerations and deviations from Member States (or countries) and the EU across these variables. Figures Figure 41 to Figure 46 and Figures Figure 47 to Figure 52 provide the same information for the periods 2001-2015 and 2008-2015 respectively.

To highlight the heterogeneity of growth trajectories of EU regions, we draw new maps for DT1 and DT2 in Figure 12, showing average scores for the 2001-2015 period, but where only regions in the top two quartiles of risk are retained. Quartile values are computed using the entire distribution of the DT measures over the 1990-2015 period to benchmark risk levels across all possible historical values. This means that we do not necessarily retain exactly 50 percent of the regions: there could be fewer or more depending on the overall distribution across all periods. Similar maps can be drawn for each year or for other subperiods using the same thresholds, compared against yearly rather than mean scores.

Darker and lighter shades of colours are for observations above the 75th and the 50th percentiles respectively. Regions above the 75th percentile can be considered as regions likely to be in a trap, regions between the 50th and the 75th percentile as regions at high risk of a trap. It is important to emphasise that whenever we refer to regions `in a trap' or `at risk of becoming trapped', we provide a diagnostic assessment of the region for its *present* state, rather than a forecast of its future development prospects. A region at risk of becoming trapped is a region that, in our view, was very nearly trapped in that year but still performed marginally better than others in the same year that were effectively trapped considered their past trajectory.

We also re-colour the regions in each category, to reflect the diverse economic trajectories of those regions likely to be or at risk of falling in a DT. We create groups using GDP/head relative to the EU average. Income is expressed in PPS to ensure cross-sectional comparisons consider geographical differences in price levels. The reference year is 2001, the first in the mapped series, thus capturing the relative position of regions in the EU at the beginning of the period. Regions with less than 10 years available in the series are not mapped. The following groups were formed:

- Development traps at high levels of income (in blue): regions whose initial GDP per capita was above the EU average. Regions in this category are economies in development traps at high levels of income, potentially even experiencing decline.

- Development traps at middle-income levels (in yellow): regions that had a GDP per head at the beginning of the period of analysis between 75 and 100 percent of the EU average. This group includes regions that have stagnated at middle-income levels in the last years.

- Development traps at low levels of income (in red): regions with a GDP per capita below 75 percent of the EU average. This final group includes regions that struggle to sustain long term growth, thus lagging behind other places in the EU.

With some approximation, this simple categorisation allows to visually highlight the different types of regional traps we might expect to find across the EU. The maps also show several regions generally considered to be in or close to the European core – very often those at the heart of the so-called 'Blue Banana' – which appear to be stagnating. Some of these, such as Nord-Pas-de-Calais, Picardie and Lorraine, would seem to have fallen in a development trap already some time ago.

Figure 12: Risk of being trapped by initial levels and top 2 quartiles over 2001-2015

DT1

■	In DT at high income (10)
■	High-risk at high income (34)
■	In DT, stagnating (3)
■	High-risk, stagnating (20)
■	In DT at low income (1)
■	High-risk at low income (6)
■	Not in DT or at risk
☐	No data

DT2

■	In DT at high income (0)
■	High-risk at high income (56)
■	In DT, stagnating (2)
■	High-risk, stagnating (35)
■	In DT at low income (2)
■	High-risk at low income (10)
■	Not in DT or at risk
☐	No data
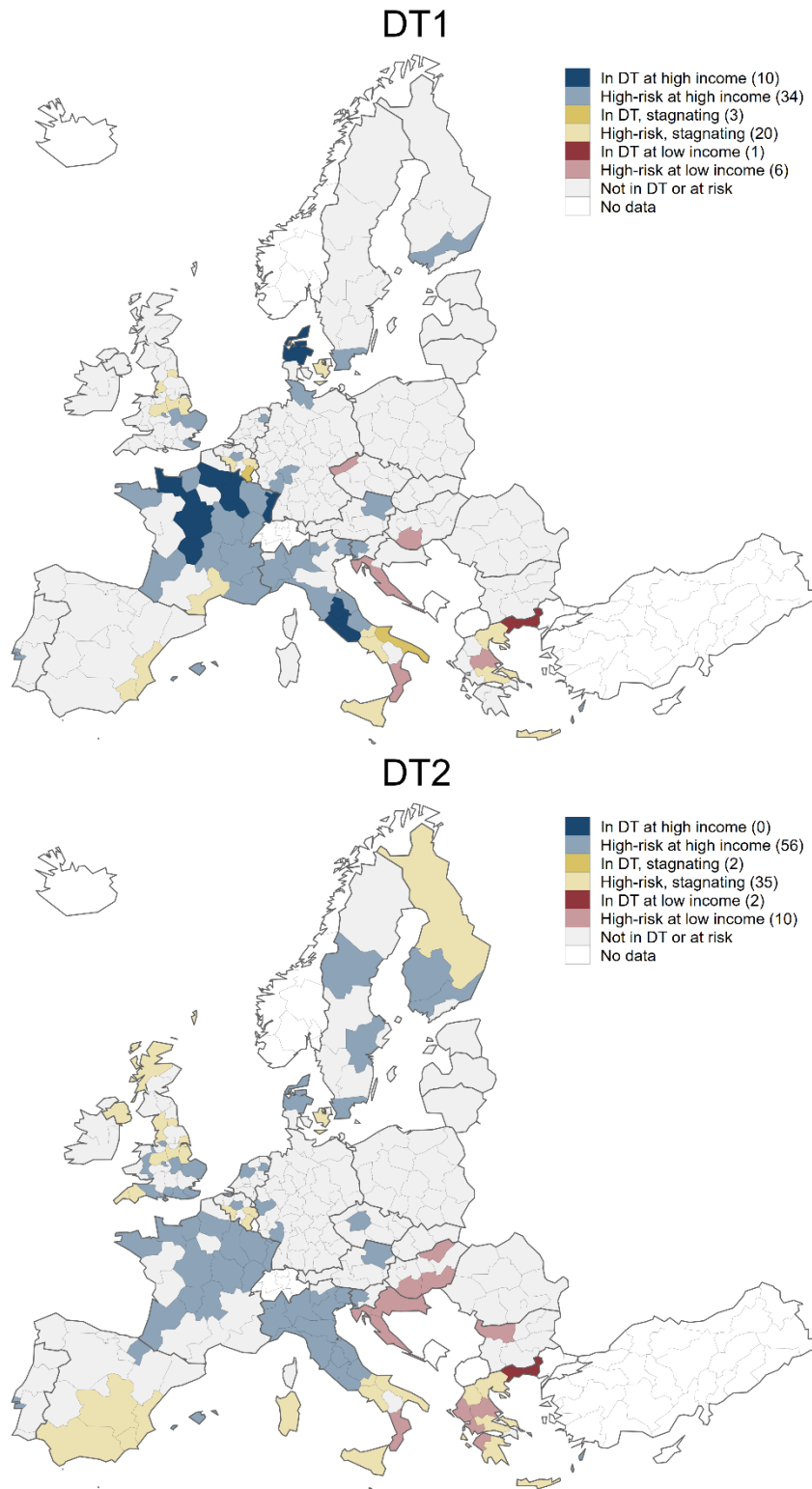
Initial levels of development consider GDP/capita in PPS in 2001. Categories defined relative to EU average. High income: above year average. Middle income: 75-100% of year average. Low income: below 75% of year average. In DT: mean scores above 75th percentile computed over the entire series. At risk: mean scores above median and below 75th percentile over the entire series. Regions with less than 10 years available in the series are not considered when drawing these maps.

The map provided above is just a snapshot illustrative of the average risk in the period considered in the regression analysis (Section 4). It should not be interpreted as a stable categorisation of regions into risk levels. Figure 53 in Annex provides maps that consider average DT scores over the longest available period in each region (1990-2015 for most regions). Scores for each region and year, including index subcomponents, are available separately in spreadsheet format.

Relying on the same categories, we can study some of the characteristics of regions in or at risk of being in a development trap, comparing them to regions that are not. Figure 13 shows average values for each category, assigning regions based on their DT1 values in each year (rather than their averages over the entire period as in the map).[18] We restrict the sample to the 2000-2015 period to ensure most regions are considered in each year.

As in the maps, low-income regions are in red, middle-income regions are in yellow, and high-income regions are in blue. In this case, regions were assigned to income categories based on GDP/capita in the same year as the variable of interest. This allows regions to change categories dynamically as they develop relative to other regions in the EU. Darker shades denote regions in a DT, lighter shades are regions at risk. Bars coloured in grey give averages for regions not neither in a DT nor at risk of falling into one. The dashed horizontal line denotes the EU average for each variable. Below are the main findings:

- **Income growth**: Unsurprisingly, regions in or at risk of a DT display lower average yearly growth rates than regions that are not, even though low-income regions tended to grow faster than all other regions irrespective of whether they were trapped. This aligns with convergence predictions but also stands to suggest that, even considering convergence, development traps seem to hold back some local economies. Also noteworthy is that the lowest levels of growth in Europe are observed for middle-income regions in a development trap. With respect to demographics, we find that regions trapped at low levels of income have no population growth, while their non-trapped counterparts witnessed population decline. This fact, perhaps somewhat counterintuitive, could reflect the ability of people in non-trapped low-income regions to `escape' their low-income environment, while people in trapped regions might well literally just be that: `trapped', unable to leave. Rather more surprising, instead, is the fact that non-trapped regions at middle and high incomes display lower population growth than their counterparts in a DT or at risk of falling into one.

- **Employment growth:** In terms of employment growth, there is no discernible difference between trapped and non-trapped regions at middle to high income levels, but it seems that in poorer regions being trapped (or at risk of becoming trapped) was associated with negative job growth. This is also reflected in employment to population ratios.

- **Investment:** Growth in gross fixed capital formation per worker tends to be higher in low income regions compared to other regions in the EU. However, within this group DT regions show the lowest growth rates, barely distinguishable from those in higher income regions, and hardly different from zero from a statistical viewpoint. Capital deepening occurs predominantly in low income regions that are neither trapped nor at risk of being trapped.

- **Structure of the economy:** Interestingly, regions in a DT or at risk of being trapped displayed lower shares of industry, irrespective of whether this is evaluated in terms of shares of total gross value added, or of total employment. Also noteworthy is that industry shares are especially high in

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[18] Figure 54 in Appendix gives the same graphs using DT2.

non-trapped low-income regions, and in non-trapped high-income regions. Middle-income economies are characterised by the lowest shares of industry across all regions. By contrast, trapped or near-trapped regions (regions at risk) show higher shares of non-market services. This is true both within and across development categories, with regions in the middle-income group displaying particularly high reliance on non-market activities compared to more and less developed regions.

- **Innovation:** In terms of innovation indicators, there is no clear pattern emerging with respect to DT status. Rather, it seems that differences are driven by income per capita of the region, both in terms of inputs (total gross expenditure on R&D, or employment in science and technology occupations) and in terms of outputs (patents per million inhabitants).

- **Demography:** In terms of demographic composition, regions in or at risk of a DT have lower levels of secondary education attainment on average in the working-age population. This is true across all income categories, although it would seem that non-trapped regions at low income levels display the highest shares of secondary education attainment. This is consistent with the median age in this group being the lowest in the EU. Perhaps surprisingly, and possibly due to problems of demand and supply matching in local labour markets, tertiary education attainment is somewhat higher in DT and DT-risk regions at low- and middle-income levels, although shares are overall higher in high-income regions. Dependency ratios are higher in DT and DT-risk regions at low income levels, but there is no clear patter emerging at higher levels (except perhaps DT regions at middle-income levels showing higher ratios compared to non-DT regions). However, it is interesting to note that middle-income regions display the highest dependency ratios overall. Unsurprisingly, we observe that higher-income regions tend to be urban, rather than rural. Yet, there is no clear difference within each income group between economies in a DT (or at risk of one) and those not.

- **Accessibility:** Similar considerations apply to accessibility, although somewhat counterintuitively accessibility is slightly higher in middle-income trapped regions (albeit comparable to the overall EU average). This however could be a result of exposure to competition from stronger neighbouring markets, rather than an indication of a negative effect of higher market potential.

- **Institutional quality:** Institutional quality as captured by the EQI index does not seem to vary significantly with DT status, except perhaps within low- and high-income groups, where it is associated with relatively lower DT scores. Unsurprisingly, levels are inversely correlated with income category.

Figure 13: Conditional averages by DT1 categories and income group
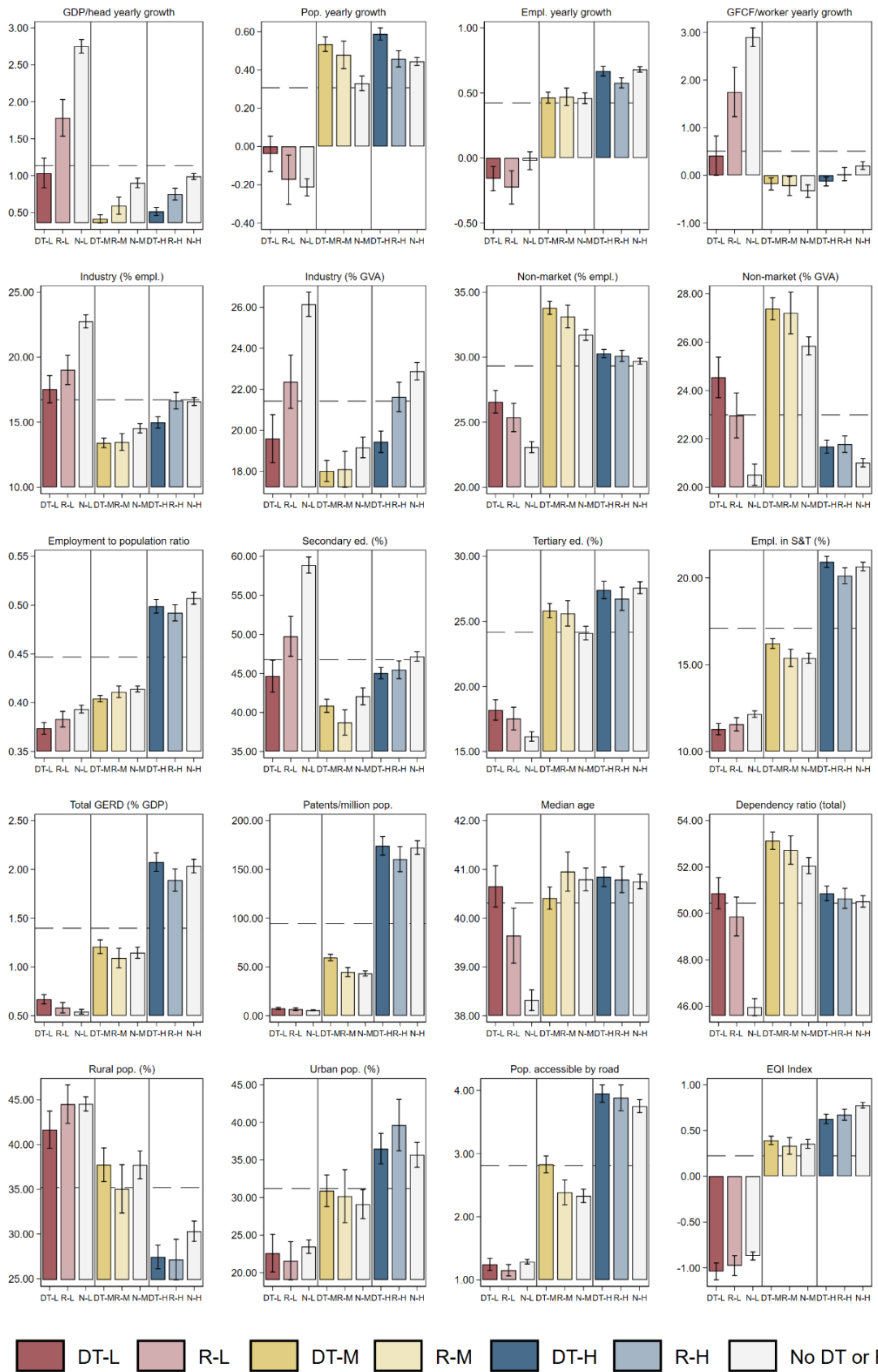

Average values by category over 2000-2015. High income (H): above the year average. Middle income (M): 75-100% of year average. Low income (L): below 75% of year average. In a trap (DT): mean scores above 75th percentile computed over 1990-2015. At risk (R): mean scores above median and below 75th percentile over 1990-2015. Dashed line: EU mean. Vertical bars: 90% CIs.

Of course, average values of the DT indices hide considerable variation in the risk profile of each region over time. In fact, one of the merits of the proposed measures is precisely that they are available on a year by year basis, allowing to capture changes and trends. Figure 14 thus offers a dynamic view of the DT_1 risk measure. It reports smoothed changes in risk levels over time in selected regions in France and Denmark.

In France, it is interesting to note the contrast between Lorraine and Picardie, on the one hand, and Ile de France, on the other. The former two, once performing strongly in metallurgy, chemical, rubber, plastic and textile sectors (as well as coal, in earlier periods), have been suffering from sustained deindustrialisation in recent years. In both regions economic restructuring has been prominent: these regions recorded incessant declines in industrial employment, combined with slow transition towards service jobs (still below French levels today in terms of share of jobs in the economy). Consequently, economic growth and job creation have been lacklustre, and population is in decline, all of which is reflected in high and growing levels of DT risk over time. In recent years, cross-border cooperation efforts (in Lorraine) and strong public investments in R&D have mitigated the adverse effects of deindustrialisation, reflected in falling DT scores. By contrast, Ile de France, host to the capital city of Paris and often regarded as the economic engine of France, displays relatively low DT scores across the period of analysis, with the exception of growing risk in the early 1990s (linked to high unemployment levels especially in the Parisian suburbs), and 2000s (due to stagnant job creation and productivity, and GDP growth below national average). In recent years, the Parisian economy has accelerated, outperforming the rest of France and Europe in terms of income, employment, and productivity growth. This is also reflected in the DT index.

Figure 14: Risk of a development trap in selected NUTS2 regions in France and Denmark
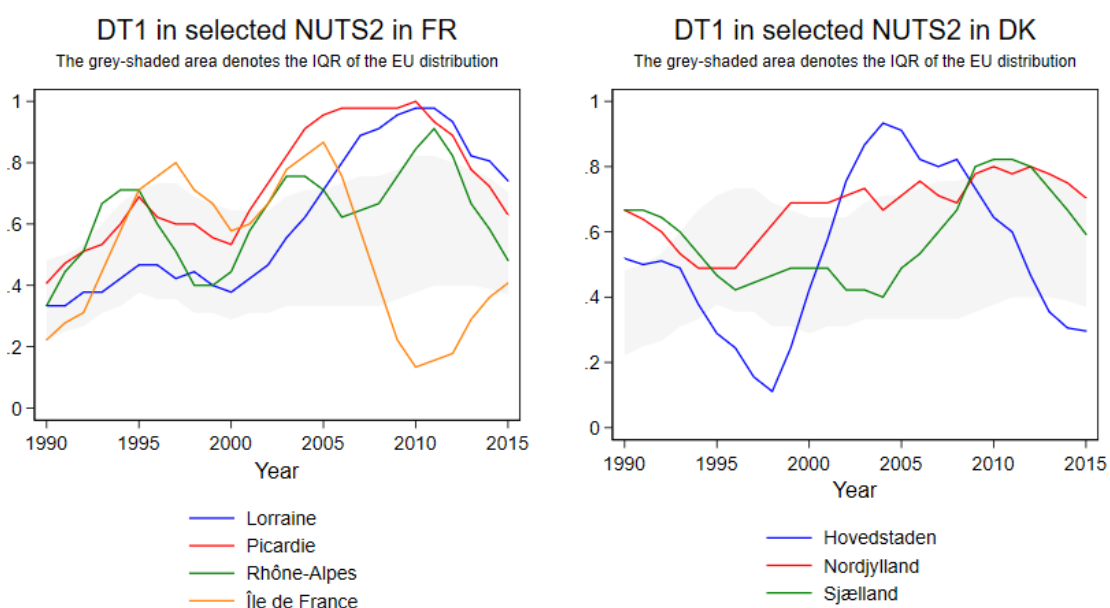
In a similar vein, we can note the contrast between North Jutland and Hovedstaden in Denmark. The former, a relatively peripheral and low-innovation region, saw high and increasing levels of DT risk over the period of study. The latter instead, host to the thriving capital city of Copenhagen, showed low risk levels across most of the period, albeit its DT risk increased sharply around the mid-2000s likely as a result of the region's inability to keep up with the strong economic performance it displayed in previous years as well as relatively high unemployment. The region of Zealand, finally, is characteristic of an area that, over time, has seen the risk of falling into a middle-income trap increase on average, despite some slow decline until the early 2000s.

Already before the inception of the Great Recession, Zeeland was performing worse than the Danish and EU regions and worse than it had performed in the past. Only recently has this risk subsided as efforts to move the economy of the region towards more knowledge-intensive production have started to bear fruit. This is reflected in falling risk levels in the measure we propose.

Figure 55, in the Appendix, gives an overview of how risk levels have changed over time in selected NUTS2 regions in Germany, Belgium, Italy and Poland. In Figure 56, also in the Appendix, we systematically report trends for the top and bottom two regions in terms of contemporary risk (DT_1) for all countries in the sample.[19]

3.2.3 Regional Middle-Income Traps?

At this stage, we are especially interested in examining whether the risk measures computed are more likely to be greater for regions at middle-income levels of the EU distribution.

Box 1: Are development traps more likely to occur at middle-income levels?

This question can be studied by looking at how the risk of being in a DT changes for regions at different levels of income. Regression analysis can help in this respect. Details on this analysis are offered below. To summarise the findings, DT risk does seem to be higher at any given point in time for regions at middle-income levels *at that same point in time*. However, a region at middle-income levels has the same risk of being in a DT *five years later* as a region at high income levels. Only regions at very low income levels show lower risk of being in a DT five years down the line. This highlights the importance to consider the highly heterogeneous development trajectories of EU regions. Limiting the notion of development traps to middle-income regions is misleading.

To examine how DT risk changes for regions at different levels of income, Figure 15 displays predicted values of risk by deciles of per capita GDP in each respective year, and by relative levels of per capita GDP with respect to the EU average in each year.[20]

In the latter case, relative GDP per capita was discretised into 20 bins of 5 percentage points width each in the 50-150 percentage points range. Values above or below these thresholds were grouped into two larger bins due to limited number of observations. In both cases, we regressed our risk indicators onto dummies for each bin (as defined above). This essentially allows us to obtain point estimates for average levels of risk in each bin, together with a confidence interval around this estimate that measures how reliable the point estimate is. Confidence intervals conveniently allow us to compare the resulting coefficients with one another (within each graph) in a statistically meaningful way. Whenever the intervals between two coefficients do not overlap, we can infer that the coefficients are different from each other at that level of confidence.

The graphs in Figure 15 thus report the predicted values of risk for each category (each bin), along with 90 percent confidence intervals. In all four graphs, it appears that dummies capturing middle-income level regions are significant predictors of higher levels of risk. When considering quantiles, regions with GDP per capita falling in the 40th to 60th percentile range appear to be at greatest risk of becoming trapped. When considering GDP per capita relative to the EU average, it is regions in the 80 to 100 percent range, although these estimates are less precise partly due to the use of narrower bins. Figure 57 in the Appendix provides similar results for development clubs as defined by Iammarino et al. (2017, 2018).

Taken together, these results give some credit to the hypothesis that, at least in the sense of a simultaneous relationship, in any given year a region that falls in the mid-

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[19] All figures are available for DT_2 as well.
[20] As in previously mentioned, we use GDP expressed in PPS when comparing levels of income in the cross-section in order to take into account geographical differences in the cost of living. However, the same graphs were also produced using GDP expressed in constant 2005 prices, confirming the findings.

ranges of per capita income in relative terms displays a higher risk profile. However, this relationship is somewhat sensitive to how middle-income is defined. Moreover, as documented in the maps in Figure 12, regions display large heterogeneity in their development trajectories, approaching middle-income from potentially very different levels. It is therefore important to adopt a dynamic perspective when discussing development traps.

Figure 15: Predicted risk of falling into a development trap by levels of income

Deciles of regional GDP per capita in PPS in each year

Regional GDP per capita in PPS as a percent of the EU average in each year
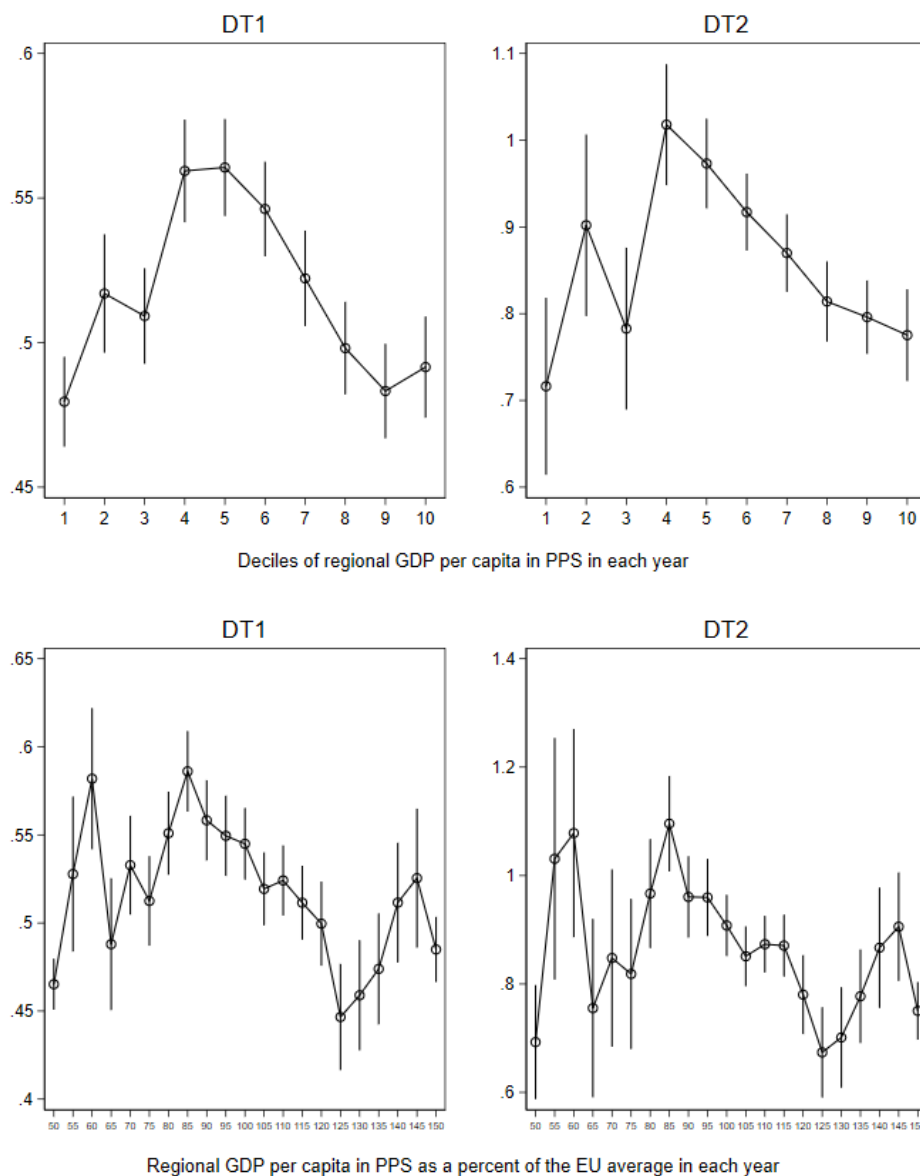
To illustrate this point, Figure 16 replicates Figure 15 but uses levels lagged by five years.[21] What is the risk profile of a region today, considered its relative income levels five years ago? When we ask this question, the relationship at middle-income levels disappears. Places that were very poor continue to display on average lower risk of becoming trapped five years later. This is in line with what one might expect from classic convergence theory. However, places above the 30th percentile of GDP per capita all have similar risk profiles on average and cannot be distinguished one from the other. This calls for a different and more nuanced analysis of what constitutes a

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[21] An equivalent graph replicating Figure 15 with lagged levels of GDP per capita relative to the EU average is available in the Appendix, Figure 58, with comparable results.

trap in EU regions. Going back to what discussed in Section 2.2.2, we may well want to consider a change in terminology and adopt the more comprehensive label of `development traps', rather than `middle-income traps', to highlight the heterogeneous nature of this concept when applied to the subnational level, in particular in the EU.

Figure 16: Predicted risk by 5-year lagged levels of development

Deciles of regional GDP per capita in PPS lagged by 5 years
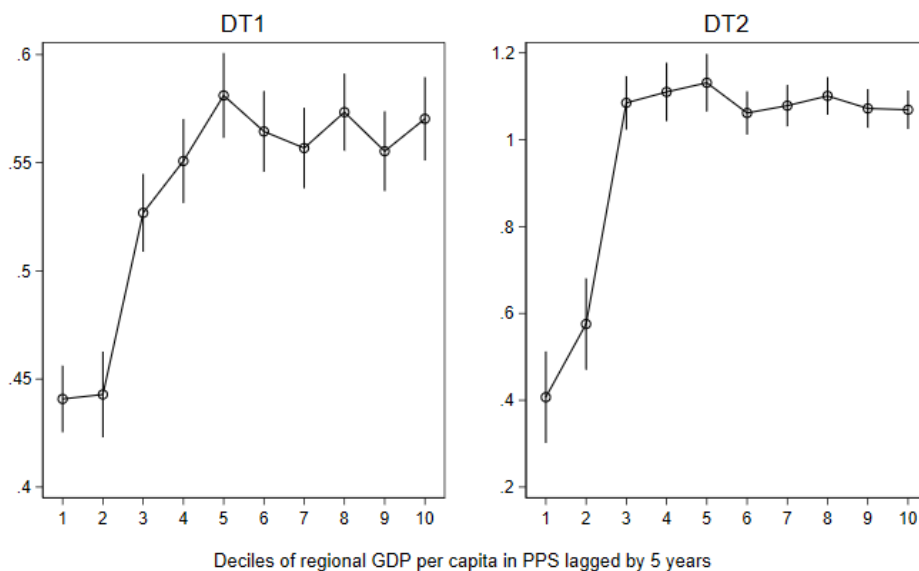
4 ECONOMETRIC ANALYSIS OF THE RISK OF BEING IN A DEVELOPMENT TRAP (AND THE POTENTIAL OF ESCAPING IT)

This Section outlines the methodology used to investigate:

a) What determines that a region is in a development trap (DT);
b) What factors can help a region escape a DT.

In order to do that, we carry out an econometric analysis of the DT indicators put together in the previous sections. The objective of this analysis is to determine what factors are empirically associated with development traps, and how changes in these factors can increase or decrease the risk of a region becoming trapped in the future. We discuss our results below.

4.1 Baseline Regressions

We propose to run two main types of analyses.

As a first step, **pooled ordinary least squares (OLS) regressions** are intended to study factors associated with the propensity of a region being trapped (or at risk of being trapped). To this end, we fit models of the following general form:

$$DT_{i,t} = \alpha + X'\beta + \gamma \ln GDPpc_{t-1} + \delta \ln POP_{t-1} + \theta_t + \epsilon_{i,t}$$

Where $DT_{i,t}$ denotes either of the two measures of the risk of being development trapped for region i at time t, X is a vector of variables of interest measured at regional level, $\ln GDPpc_{t-1}$ and $\ln POP_{t-1}$ are the one-year lagged levels of log per capita income and population in the region, and θ_t represents year fixed effects intended to capture general trends across all European regions in each period. Income per capita and population are included to control for the initial economic and demographic size of

the region. Finally, $\epsilon_{i,t}$ is an error term clustered by regions, thus robust to heteroscedasticity and serial correlation. This is to address the possibility that the variance of the residuals may change across groups of regions in a way that is correlated with the explanatory variables in the model, and that each error term at time t is related to that of previous periods.[22]

As a second step, we rely on **fixed-effect panel data analysis** to explain within-region annual changes in DT measures as a function of changes in selected covariates. This would shed light on the potential of individual regions of escaping a DT or, conversely, falling deeper into a trap. The analysis using panel data with fixed effects will assess how the DT risk varies in each region over time, and what time-variant factors contribute to that change.

Econometrically, **panel data estimation also helps address concerns related to any unobserved determinant of DT risk that is specific to each region and does not change over time.** Examples of such factors could be physical geography (e.g., proximity to rivers, soil quality, terrain ruggedness), but also historically-determined (e.g., slow-changing local cultures and attitudes). To the extent that these factors are also correlated with the explanatory variables in the model, not taking them into account can result in erroneous point estimates of regression coefficients – or `endogeneity bias' (see Wooldridge, 2012, for an introduction). Panel data analysis with regional fixed effects addresses this issue by focussing on changes taking place within each region over time rather than also across all regions in the same period. More formally, we estimate the following econometric model:

$$DT_{i,t} = X'\beta + \phi_i + \theta_t + \epsilon_{i,t}$$

All variables are defined as in the previous model, except for the new term ϕ_i, which denotes a set of dummies for each NUTS2 region. Moreover, note that X now only includes variables that change over time in each region. The error term is robust to heteroscedasticity and serial correlation.

4.2 Explanatory Variables

A key step in the empirical analysis is to decide what variables to include in the econometric model, that is, the composition of vector X. This decision is driven by theoretical considerations. In line with what was discussed in the previous sections and taking into account the traditional determinants of growth derived from the main economic growth theories, we consider five broad groups of variables:

- Economic structure;
- Physical capital and infrastructure;
- Demographics and labour force;
- Total factor productivity; and
- Economic geography, trade and internationalisation.

We provide details on each group below. All variables are obtained from Eurostat or were made available by the European Commission (DG REGIO). A list of all variables considered in this analysis, along with definitions and sources, is available in Table 11 in Annex. Covariates are included in empirical models with a one-year lag, to allow for delayed effects and to mitigate concerns of simultaneity bias.

Economic structure. Variables in this group are intended to capture the economic structure of each region and detect the role played by patterns of sectoral

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[22] Not addressing this would result in possible failure of the homoscedasticity assumption required by OLS estimators and absence of serial correlation required for time-series data. Both affect inference. In other words, assuming all other assumptions are met, the model would yield consistent and unbiased coefficients, but the t-statistics and confidence intervals would be wrong. For a more rigorous introductory discussion of this point, please refer to Chapters 8, 13 and 14 in Wooldridge (2012).

specialisation. This can be expressed either in terms of employment shares in each sector, or in terms of shares of sector GVA on total GVA. Three main sectors are considered: industry, non-financial services, and financial and business services. In addition, we also control for agriculture and farming, construction, and non-market services (mainly covering public services in the areas of social welfare, health, education and defence).

Physical capital and infrastructure. This set of variables includes information on regional gross fixed capital formation. Connectivity infrastructure, notably roads, is captured indirectly by accessibility measures.

Demographics and labour force. This group considers variables related to the region's resident population and workforce composition or structure. It looks primarily at educational attainments of adults (defined as individuals aged 25 to 64), to proxy for human capital. It also considers median age and population dependency ratios.

Total factor productivity. This group represents the most heterogeneous set of variables, encompassing a number of factors that featured prominently in the theoretical section of the inception report. The dimensions considered comprise:

- Sector-level productivity: GVA/worker in each sector, included to understand which sector's productivity gains are driving overall regional productivity growth as captured within the DT measure.

- Innovation and knowledge capital: R&D expenditure/capita (broken down by sectors of performance, whether business enterprise, government, higher education, or private non-profit); employment in science and technology sectors; patents per capita.

- Institutions: Regional government quality, as captured by the now widely used European Quality of Government Index (EQI) index and its sub-components (Charron et al., 2014).

Economic geography. We primarily look at population density and road accessibility. Other accessibility measures such as transport performance (roads and railways) or airport connectivity are also available, but only for a limited time period. We hoped to study international integration variables such as trade flows and counts and values of inward and outward foreign direct investment (FDI) originating from within or outside the EU (potentially with a breakdown by sector), but this information is only available as a cross-section of stocks at the end of the period of study. We will however offer some qualitative insights into these factors using the case studies.

4.3 Results and Discussion

What follows comments on the main findings from the regression analysis we carried out systematically on all explanatory variables listed above. For conciseness, we provide a synthesis thereof.[23] All regressions refer to outcomes for the 2001-2015 period, with explanatory variable lagged by one year (2000-2014). We also emphasise that all results represent statistical associations in the data which cannot per se be interpreted as causal relationships. The latter would require a different and more targeted type of analysis (when at all feasible), which falls beyond the scope of this report. Comments focus on the analysis of the DT1 measure. Appendix Tables Table

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[23] Detailed regression tables studying all explanatory variables in a systematic way were produced as unpublished notes and are available at request. We also routinely ran standard regression diagnostic tests such as Vector Inflation Factors (VIFs) reports and correlation matrices, to mitigate concerns of multicollinearity.

12, Table 13 and Table 14 provide equivalent regressions for DT2. The results of the DT2 analysis, despite some variations, fundamentally corroborate the estimations using DT1. For robustness, we also report in Appendix all regressions obtained using shares of GVA for economic structure, rather employment (Tables Table 15 and Table 20). Summary statistics for all variables in these regressions are available in the Appendix too (Table 10). To provide context, Figure 17 shows annualised growth rates in real income per capita across the EU over the period considered in the econometric analysis.

Figure 17: Annualised growth in real GDP/head in the EU for 2001-2015
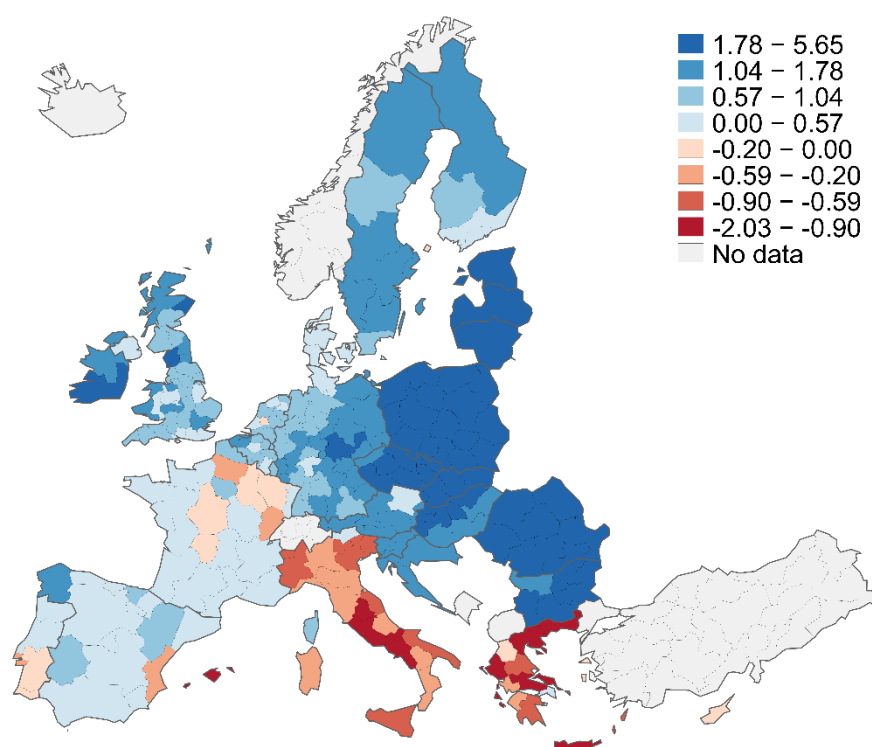
4.3.1 The Propensity of Being Trapped

Table 3 gives baseline results for pooled OLS regressions. These regressions inform us about the factors associated with the propensity of a region to be trapped in any given year (or having been at risk of becoming trapped in that year). We report unstandardized coefficients, which can be interpreted as level changes in the outcome for a one-unit change in the explanatory variable. Shares are expressed in percentage points. This said, the emphasis should go on the qualitative direction of the results, rather than their magnitude. Note that in all regressions the outcome variable is always multiplied by 100 to improve legibility of the coefficients.

- In general, we find that being development trapped is not a factor that in the EU mainly affects middle-income regions. Indeed, regions with a higher *income per capita* tend to display higher levels of DT risk. It is important to remind the reader at this stage that it is extremely difficult to empirically disentangle the status of being trapped from simply being closer to a steady state equilibrium. Documenting lower dynamism at high income levels is consistent with neoclassical growth models and convergence theory and not necessarily evidence of being trapped. Due to this it is well possible that the method proposed herein tends to overestimate DT risk for more developed regions. Box 2 elaborates on this concept, highlighting important conceptual differences. The coefficient on population, on the other hand, is not straightforward to interpret, to the extent that the geographical units considered do not represent functional

labour market areas but capture administrative boundaries.[24] We treat this variable more as a control than as a factor associated with traps.

Table 3: Baseline pooled OLS regressions using DT1

	(1)	(2)	(3)	(4)	(5)	(6)
ln GDP/head	5.893** (2.301)	10.09*** (2.231)	7.939*** (2.177)	9.642*** (2.225)	7.142*** (2.643)	10.77*** (2.488)
ln Population	2.367*** (0.911)	2.156** (0.863)	2.507*** (0.965)	2.575*** (0.945)	2.473*** (0.928)	2.234** (0.877)
Industry (% Empl.)	-0.0684 (0.136)	-0.229* (0.135)	-0.314** (0.137)	-0.262** (0.131)	-0.104 (0.143)	-0.236* (0.136)
Non Fin. Serv. (% Empl.)	0.122 (0.187)	-0.108 (0.176)	0.0648 (0.193)	0.0374 (0.191)	0.102 (0.190)	-0.119 (0.177)
Non Market Serv. (% Empl.)	0.639*** (0.132)	0.613*** (0.128)	0.602*** (0.142)	0.595*** (0.140)	0.629*** (0.134)	0.609*** (0.130)
Ind. productivity	-0.0556** (0.0216)	-0.137*** (0.0422)	-0.0571*** (0.0212)	-0.0571*** (0.0216)	-0.0544** (0.0211)	-0.133*** (0.0423)
Tot. GERD (% GDP)	-1.611* (0.843)		-1.868** (0.871)	-1.247 (0.939)	-1.299 (0.901)	
Gov't GERD (% GDP)		-11.78*** (3.582)				-11.25*** (3.599)
Secondary ed. (%)	-0.181*** (0.0601)	-0.132** (0.0578)			-0.142* (0.0731)	-0.112 (0.0686)
Tertiary ed. (%)			-0.110 (0.130)			
Empl. in S&T (%)				-0.550*** (0.194)	-0.275 (0.237)	-0.149 (0.221)
Dependency ratio	0.648*** (0.142)	0.460*** (0.140)	0.656*** (0.149)	0.564*** (0.147)	0.597*** (0.146)	0.435*** (0.140)
EQI Index	-4.314*** (1.216)	-5.114*** (1.209)	-4.568*** (1.281)	-4.132*** (1.227)	-4.063*** (1.242)	-4.979*** (1.231)
R2 Adj.	0.1586	0.1478	0.1521	0.1563	0.1592	0.1478
R2	0.1645	0.1536	0.1581	0.1623	0.1654	0.1538
F Test	24.1006	22.9988	21.4139	23.9536	22.4738	21.1223
Obs.	3,382	3,575	3,382	3,382	3,382	3,575

All models absorb year dummies. SEs clustered by hybrid region. Significance: *** p<0.01; ** p<0.05; * p<0.1. Estimation sample restricted to 2001-2015. All explanatory variables are lagged by one year.

- In terms of *economic structure*, being development trapped is also connected with having lower shares of industrial GVA. Regions with higher industrial employment in any given year have been more resilient to DTs. By contrast, keeping industrial shares fixed, greater specialisation in services, appears to increase the risk of being trapped. This is particularly the case for regions with high levels of non-market services (reported herein), rather than with non-financial services.[25] Non-market services include public administration, defence, education, human health and social work activities, arts, entertainment and recreation, other service activities, activities of household and extra-territorial organizations and bodies. Broadly speaking, they can be regarded as a measure of local public sector support through public employment, transfers and social assistance. Interpreted this way, the finding on non-market services aligns with extant literature discussing the performance and drawbacks of

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[24] This was partly mitigated by combining smaller regions around selected main cities into unique urban areas (e.g., London, Brussels, and Vienna).

[25] The role of financial and business services could not be estimated in the set of regressions reported here, due to multi-collinearity issues in the model specification. In results not included herein, however, the role of this sector appears to be minor.

'sheltered economies' (Fratesi & Rodríguez-Pose, 2016; Rodríguez-Pose & Fratesi, 2007). The advantage of being sheltered is that it makes regions with a higher share of non-market services "more protected from the risk of downturn in the cycle", but it also renders them "less capable of taking advantage of high growth periods" (Rodríguez-Pose & Fratesi, 2007, p. 624), meaning that they are potentially at risk of being stuck for longer periods in DTs.[26]

Box 2: Development traps at high-, middle-, and low-income levels

In neoclassical growth theory (Solow, 1956), there is an inverse association between growth in income per capita and initial levels of per capita output or income. The key reason for this is diminishing returns to factors of production, whereby every extra unit of capital or labour added to the economy, keeping other resources fixed, contributes less than the previous one to aggregate output. This relationship has been documented empirically in different contexts, and is generally referred to as `convergence' (Barro, 1992; Barro, Sala-I-Martin, Blanchard, & Hall, 1991). Are there self-adjusting forces in the economy that ultimately allow equalisation of per capita products across places (countries or regions)? Do initially poorer places catch up with richer ones? And importantly for this project, how can we interpret the concept of development traps in the light of convergence theory? What does it mean to be trapped at high- or low-income levels?

It is important to consider that due to convergence forces, the method proposed herein will tend to overestimate the risk for regions at higher levels of income. At the same time, as discussed in Section 2.1, there are important conceptual differences between convergence and development traps. The latter are persistent and stable states of low (or inexistent) growth, typically resulting from having fallen into a `bad equilibrium' out of multiple possible ones given certain structural features of the economy. Convergence, instead, describes a state of transition towards a unique steady-state equilibrium, defined in absolute or relative (`conditional') terms. While development traps and convergence can be observationally similar, they are nonetheless distinct concepts. This report discusses development traps and, as such, its focus is on the *dynamism* of local economies irrespective of income levels and their steady-state equilibrium adjustment process. This entails that a priori we allow for economies to be trapped at very different stages of development. Stagnation in economic performance can thus occur at low-, middle- as well as high-income levels. This is consistent with endogenous growth theory and new economic geography models, which discuss the possibility of multiple equilibria and sustained divergence even for economies that are comparable in their initial fundamentals (Krugman, 1991; Lucas, 1988; Romer, 1986, 1990). The conceptual innovation proposed in this report with the notion of development traps lies in this difference. Moreover, with multiple equilibria, policy can play a role to help trapped economies achieve higher-level outcomes.

In our data, regions with higher income per capita tend to display higher levels of DT risk. This empirical finding is observationally consistent with convergence, partly leading to overestimation of DT risk. Considering the above, then, how can one interpret the evidence of traps even potentially at relatively high-income levels? Without denying that convergence forces could also be at play, there is more to it. Ultimately, being trapped is about loss of economic dynamism. In higher-income places, slowdowns are not necessarily bad per se, and it is certainly more desirable to live in an economy losing its dynamism at high- rather than low-income levels. However, from an endogenous growth viewpoint, prolonged slowdowns, and indeed long-term stagnation, are indicative of something not working in the development strategy that allowed the region to reach high income levels to begin with, or failure to adapt to a changing economic landscape. Sustained over time, stagnation puts regions at risk of falling out of their `development club' because they lose ground to their peers in relative terms. Research has documented the negative effect this can have on individuals exposed to this type of dynamic, notably in terms of resentment and discontent (Dijkstra et al., 2018; Rodríguez-Pose, 2018). To this end, it is also relevant to consider the difference between the two proposed measures of development traps, where the DT2 can provide additional insight into the *intensity* of these traps. More in general, different theoretical priors will lead to different interpretations of the index, especially at high income levels. Moreover, high-income regions are not a homogenous group, each potentially following a trajectory consistent with either theory (neoclassical or endogenous growth). This heterogeneity, however, is very difficult to capture empirically.[27]

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[26] It should be noted that because non-market services also include publicly supported arts, entertainment and recreation activities, this measure may not be entirely relevant to capture 'sheltered economies'. Moreover, bias may be introduced to the extent that these activities, as well as public administration and defence, may tend to cluster around large cities and urban areas more in general. Unfortunately, however, we cannot distinguish these sub-sectors in our data and can only comment on the more aggregate picture.
[27] Case study evidence from South Sweden (Sydsverige), a high-income region, is discussed in Section 5 to provide additional insight into development traps in more developed places.

- *Demographic structure* also plays an important role in determining which EU regions are more likely to be development trapped. On average, regions with a higher DT risk also appear to have higher dependency ratios (on either end, whether young or old dependents are considered, although we only report the total dependency ratio here). One possible explanation is that higher dependency ratios reflect a smaller relative size of the working-age population, such that labour is reduced as a factor of production in the economy, thus also reducing potential output. Another interpretation, which emphasises reverse causality, is that population sorting results in either younger (compulsory school-age) or older (retirement-age) individuals representing larger shares of population in less dynamic places (e.g., if working-age individuals selectively migrate towards more dynamic local economies). Sorting effects in migration decisions are well-known based on human-capital investment type of models, and selection models à la Roy (1951). It is difficult to pin down the exact mechanism empirically in the absence of an experimental or quasi-experimental setting, which falls beyond the scope of this study.

- In terms of *government quality*, better institutional environments, as proxied by the EQI measure, help mitigate the chances of a region being in a trap. This aligns with previous findings in the literature, which emphasise the role of hard and soft institutions in fostering regional economic development (Charron et al., 2014; Morgan, 1997; North, 1990; Rodríguez-Pose, 2013; Rodríguez-Pose & Storper, 2006). There is also evidence that local government quality matters as it allows more effective use of resources, such as for instance Cohesion Policy resources (Rodríguez-Pose & Garcilazo, 2015), infrastructure Investments (Crescenzi et al., 2016), or innovation (Donges, Meier, & Silva, 2017; Rodríguez-Pose & Di Cataldo, 2015).

- Finally, there is some evidence that *industrial productivity, human capital, and resources in support of technological progress* matter, although the relationship is less clear in this full sample (we will show that there are important non-linearities in these relationships, which depend on initial income levels). While overall spending on research and development (total GERD) is qualitatively associated with a lower DT risk, this relationship is not always statistically significant at conventional levels. By contrast, it appears that government sector GERD matters, and with a higher (negative) point estimate. Regions where governments invest more in R&D are less prone to be trapped than those were this type of investment is weaker. Differences in labour force qualifications also determine which regions are more likely to be in a development trap. In particular, human capital – proxied by educational attainment – is negatively associated with DT risk for secondary and tertiary education, although not in a statistically significant way in the latter case. We also looked at primary education, finding that it is associated with higher values of our DT measure, as would be expected based on growth theory predictions. We did not include the result on primary education as we decided to emphasise the roles of secondary and tertiary education in our analysis, and because including all three would result in multicollinearity problems. On the whole, the coefficients for the variables that depict the regional human capital endowment tend to be weaker and less significant than those for sectoral structure, dependency ratios, and government quality. In line with Romer (1990)'s modelling of endogenous technological change, we also explicitly look at total human capital employed in science and technology (S&T) activities. This appears to play an important role in reducing DT risk, although the statistical significance of this variable partly depends on whether government GERD and secondary education shares are considered.

- In results not reported herein, we also looked at the effects of (the log of) *gross fixed capital formation* per capita. Capital deepening reduces our measure of development trap, as would be expected, but introducing this variable caused multicollinearity issues as indicated by large variance inflation factors. We therefore opted to drop it from our main estimates. We also looked at accessibility, which we consistently found to be insignificant in the context of our data and conditional on all other explanatory variables. We also reject the presence of non-linear effects in income per capita, as the quadratic of log GDP/head is insignificant.

Table 4 investigates **non-linearities** and **heterogeneous effects** more systematically. We take the model in Column (6), the preferred specification from Table 3, and re-estimate it onto different subsets of the sample conditional on selected characteristics (notably initial development levels of the region and time periods). Some interesting findings emerge. Column (1) is equivalent to Column (6) in the previous table and is copied here for reference. Columns (2)-(4) consider different initial levels of development, defined the same way as we did in the previous sections (below 75%, between 75 and 100%, and above 100% of average EU GDP for low, middle, and high income respectively).[28] Columns (5) and (6) compare effects before and after the crisis.

Table 4: Pooled OLS regressions over subsamples using DT1

	(1) All	(2) Low	(3) Middle	(4) High	(5) Pre-2008	(6) Post-2008
ln GDP/head	10.77***	14.99***	30.77***	19.60***	12.98***	5.597*
	(2.488)	(4.041)	(8.456)	(6.344)	(3.428)	(3.269)
ln Population	2.234**	3.361**	0.861	1.724	2.008	2.330**
	(0.877)	(1.393)	(1.625)	(1.397)	(1.259)	(1.124)
Industry (% Empl.)	-0.236*	0.307	-0.0356	-0.357	-0.0942	-0.424*
	(0.136)	(0.193)	(0.383)	(0.216)	(0.185)	(0.219)
Non Fin. Serv. (% Empl.)	-0.119	0.260	-0.664*	-0.101	-0.571**	0.309
	(0.177)	(0.287)	(0.371)	(0.283)	(0.261)	(0.223)
Non Market Serv. (% Empl.)	0.609***	0.962***	0.454*	0.525*	0.323	0.806***
	(0.130)	(0.236)	(0.266)	(0.294)	(0.198)	(0.171)
Ind. productivity	-0.133***	-0.297**	-0.126	-0.232***	-0.183***	-0.0750
	(0.0423)	(0.133)	(0.0807)	(0.0555)	(0.0653)	(0.0526)
Gov't GERD (% GDP)	-11.25***	-11.12	-8.591	-8.742**	-10.24**	-12.86**
	(3.599)	(11.34)	(7.815)	(4.205)	(4.914)	(5.046)
Secondary ed. (%)	-0.112	0.208**	-0.158	-0.280**	-0.156*	-0.0822
	(0.0686)	(0.0905)	(0.124)	(0.109)	(0.0914)	(0.0902)
Empl. in S&T (%)	-0.149	-2.744***	-0.0717	0.324	0.753**	-0.770***
	(0.221)	(0.554)	(0.461)	(0.300)	(0.311)	(0.296)
Dependency ratio	0.435***	1.156***	0.0701	0.458	0.276	0.753***
	(0.140)	(0.262)	(0.314)	(0.311)	(0.217)	(0.165)
EQI Index	-4.979***	-2.890*	-6.925***	-5.490**	-3.247*	-5.080***
	(1.231)	(1.704)	(2.071)	(2.285)	(1.713)	(1.462)
R2 Adj.	0.1478	0.3233	0.2068	0.1168	0.0895	0.2468
R2	0.1538	0.3428	0.2250	0.1305	0.0984	0.2543
F Test	21.1223	30.0362	4.4517	5.4961	10.7019	17.0342
Obs.	3,575	868	1,094	1,613	1,854	1,721

All models absorb year dummies. SEs clustered by hybrid region. Significance: *** $p<0.01$; ** $p<0.05$; * $p<0.1$. Estimation sample restricted to 2001-2015. All explanatory variables are lagged by one year.

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[28] In results not reported herein, we investigated heterogeneous effects more flexibly by regressing DT measures onto variables of interest, interacted with income-deciles dummies in order to break down marginal effects by ten categories of initial GDP per capita. We preferred to present results in terms of subsamples in this Report, due to conciseness and ease of interpretation. We also looked at a fourth category defined as very high income regions (per capita income above 150% of the year average across the EU), with largely comparable results.

- In terms of *economic structure*, it appears that having a larger industrial sector is associated with a lower DT risk mainly in the post-crisis period and, although insignificant in a statistical way, in wealthier regions (due to a greater, albeit less precise, point estimate for this group). This would suggest that higher income regions with strong industry were somewhat more resilient to the macroeconomic downturn. It also highlights that policy would be mistaken to pursue industrial employment at all costs as a strategy to overcome traps. The association between industry and DT is driven by the fact that only places where industry was competitive performed better. Safeguarding industrial jobs in and of itself is likely neither an effective nor a sustainable strategy for development, especially if it is in sectors that struggle to remain competitive on international markets. By contrast, sheltered economies (greater share of employment in non-market services) were associated with higher DT risks, especially at lower income levels and in the post-crisis period. Non-financial services appear to mitigate DT risk in middle-income regions and during the pre-crisis period.

- Interestingly, we find that *productivity in the industrial sector* matters especially at low- and high-income levels, and before the crisis. There is no statistically significant relationship between industry productivity and DT risk in middle-income economies or in the post-crisis period. The relationship between industry and productivity, in general, supports the point made above regarding the fact that promoting a large industrial sector is unlikely on its own to be a useful policy to address or prevent development traps.

- The coefficients also denote no relationship between *government GERD* and DTs in low- and middle-income regions: in terms of likelihood of being or falling into a trap, investments in R&D appear to be complements to the wider pre-existing economic prosperity of a region. Consequently, it can be inferred that increasing public support to innovation in these areas may represent a viable policy to help regions to come out of a trap, but it is not a one-size-fits-all solution.

- This also appears to be true for *institutions*. Better quality of government is negatively related to DT risk in middle- and high-income regions (especially so in the former), but not so much in poorer ones (smaller relative size of the coefficient). This implies the existence of a certain threshold in terms of how variations in government quality affect the risk of being trapped. For the regions in the EU with the lowest level of development this is mostly connected with the presence of a large non-market services sector, relatively low levels of education, low industrial productivity, low employment in science and technology, and a high dependency ratio. Low government quality plays much less of a role than for the propensity of middle- and high-income regions being trapped. By contrast, for middle-income regions the salience of all these factors – except for the share of gross value added in non-market services – becomes overshadowed by the role of government quality. This result is very much in line with recent research by Rodríguez-Pose & Ketterer (2019, p. 11), who state that "as the level of initial development increases, regions hit a middle-income trap […] and the influence of more traditional growth factors wanes. Hence, in the low-growth regions of Southern Europe, government quality becomes more relevant in determining which territories are and remain dynamic and which are not"

- Another interesting point to highlight is the relationship between *human capital, science and technology (S&T) employment*, and income: in low income regions, attainment of secondary education not only does not help mitigate DT risk, it even seems detrimental for being in a DT. Less developed regions with

larger shares of individuals with secondary education are more likely to be stuck in a trap. What appears to matter in these regions, instead, is science and technology jobs that lift the economy. By contrast, in high income regions secondary education pays off, suggesting that intermediate-skilled jobs in these places seem to play a larger role, irrespective of the level of employment in S&T in the region. This is once again likely hinting at the presence of complementarities between human capital accumulation and the economic environment of higher income places.[29] This presumably has to do with the fact that, in order to benefit from more human capital in the region, there must also be an overall economic environment that allows this resource to be productively employed. This finding aligns with a large and growing literature on spatial skill mismatch and resource misallocation, partly reviewed in Section 2. Human capital accumulation alone is insufficient to spur dynamism in low-income regions and mitigate DT risk. It would rather seem that poorer regions are better off on average when they have a high share of employment in S&T that allows human capital to be put to greater productive use. Furthermore, it is important to note that what is captured here is *quantity* and not *quality* of education, the latter explaining the returns to schooling, and hence the incentives to human capital accumulation and its composition (Castelló-Climent & Hidalgo-Cabrillana, 2012). According to the literature – still relatively scanty in economic geography – quality of education and vocational training show strong heterogeneity at the subnational level (Agasisti & Cordero-Ferrera, 2013; Filippetti, Guy, & Iammarino, 2019). Also, interesting to note is the positive relationship between science and technology employment and DT risk before the financial crisis. This is likely driven by high-income regions at the forefront of the technological frontier, whose economic growth performance is weaker (see discussion above with respect to GDP per capita). This hypothesis finds qualitative validation in that the S&T employment coefficient is positive for this sub-sample of regions (although insignificant in a statistical sense). Finally, it appears that high dependency ratios are associated with a higher risk of being or falling in a DT mainly in low-income regions and in the post-crisis period.

4.3.2 The Likelihood of Escaping the Trap

What about the dynamic dimension of development traps? What determines the capacity of individual regions in the EU of clawing out of a DT? Table 5 presents the results of estimating the fixed effect regressions addressing precisely these questions.

The coefficients on fixed effects regressions give the average relationship between changes in a given variable and their effects on changes in DT risk within a region. As such, they can be interpreted as informing us about factors that affect the likelihood and ability of a region to either remain or claw its way out of a development trap. Importantly, fixed effects control for any region-specific time-invariant factor that may confound estimates in the pooled OLS results. As in the previous table, we consider the full sample in Column (1), different levels of development in Columns (3) to (5), and different time periods in (6) to (7). Additionally, in Column (2) we run the model on long differences (three years), to address the possibility of insufficient variation within regions over time when short time frames are considered (due to variables changing slowly).[30]

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[29] This is also true if tertiary education is considered, rather than secondary, although the latter was preferred due to the high correlation between share of tertiary education attainment and share of employment in science and technology jobs. Tertiary education itself does not seem to be significantly associated with lower DT risk in low income regions (results not reported here).

[30] Note that the logs of population and per capita income have been dropped in this specification. Controls for levels are absorbed by regional dummies anyway, and the inclusion of these variables in the fixed effects model would estimate coefficients for population and income growth, which enter our outcome variable by

Table 5: Fixed effects regressions using DT1

	(1) All	(2) Long diff.	(3) Low	(4) Middle	(5) High	(6) Pre-2008	(7) Post-2008
Industry (% Empl.)	-1.587** (0.654)	-2.637*** (0.806)	0.721 (0.982)	-0.356 (1.098)	-4.087** (1.608)	-1.291 (0.911)	1.833 (1.396)
Non Fin. Serv. (% Empl.)	-1.229* (0.693)	-2.366*** (0.849)	-0.283 (0.896)	0.0236 (0.990)	-2.785** (1.212)	-1.132 (1.054)	0.839 (1.152)
Non Market Serv. (% Empl.)	1.108* (0.618)	0.610 (0.788)	2.322*** (0.739)	1.228 (1.269)	-1.476 (1.076)	-0.468 (0.992)	2.311** (0.908)
Ind. productivity	-0.423*** (0.117)	-0.252 (0.166)	-1.410*** (0.415)	-0.312* (0.163)	-0.265 (0.165)	-0.493** (0.206)	-0.392*** (0.125)
Gov't GERD (% GDP)	-18.22 (11.05)	-11.81 (13.23)	-26.19 (29.44)	30.97 (20.84)	-19.81 (16.10)	-1.847 (16.38)	-6.743 (16.45)
Secondary ed. (%)	-0.356 (0.272)	-0.894** (0.393)	0.722 (0.520)	-1.028** (0.456)	-1.047*** (0.398)	-0.516 (0.361)	-0.512 (0.452)
Empl. in S&T (%)	-1.409*** (0.433)	-1.533** (0.591)	-2.595** (1.117)	-0.476 (0.681)	-1.574** (0.682)	0.544 (0.701)	-2.697*** (0.533)
Dependency ratio	-0.895** (0.454)	-0.989** (0.497)	0.888 (0.817)	-2.506** (0.980)	-1.594* (0.874)	0.565 (0.819)	-3.327*** (0.810)
EQI Index	-9.316** (3.709)	-15.94*** (4.109)	8.694 (7.132)	-5.271 (5.928)	-23.75*** (6.286)	-6.845 (6.737)	4.374 (5.636)
R2 Adj.	0.2716	0.1856	0.3999	0.3687	0.2998	0.3026	0.5081
R2	0.3289	0.3697	0.4678	0.4442	0.3705	0.4035	0.5848
F Test	5.7662	6.1887	7.8333	2.4737	6.4967	1.5661	7.6979
Obs.	3,572	1,169	868	1,088	1,606	1,846	1,721

All models absorb region and year dummies. SEs clustered by hybrid region. Significance: *** p<0.01; ** p<0.05; * p<0.1. Estimation sample restricted to 2001-2015. Long diff.: 2001-04-07-10-13. All explanatory variables are lagged by one year.

- In terms of *economic structure*, we observe once again that a larger industrial sector is associated with falling DT risk levels. More accurately, regions that have been able during the period of analysis to expand their industrial sector – or witness a lower industrial decline than other regions in Europe – appear to have a greater capacity to come out of development traps. This was especially true in high-income regions, presumably suggesting that there are complementarities between a high-income economic environment and successful industry performance (e.g., due to higher productivity). This further reinforces the cautionary tale mentioned above with respect to policies supporting industrial employment at all costs. Growth of non-market services, by contrast, is associated with an increase in the risk of falling into a DT, especially in low-income regions and after the crisis. Of course, we cannot rule out reverse causality, whereby greater relevance of non-market services would be a result of stagnation or decline in the region, rather than the other way around, a hypothesis that would be worth exploring. Confronted with economic stagnation, it could be that public sector activities are the most resilient ones or are slower to adjust. Regions with a greater reliance on non-market sectors are more likely to remain stuck in a trap, but it may also be the case that, once a region becomes stuck in a trap, policy intervention aiming to expand the relevance of non-market sectors – by, for example, increasing the amount of jobs in the public sector – may end up not yielding the desired effects. In this set of regressions, non-financial services also matter somewhat, in that an expansion of employment in this sector is associated with lower DT risk, albeit mainly in high-income regions.

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construction. Moreover, both population and per capita income were strongly affected by problems of multicollinearity in this specification.

- *Industry productivity* also plays a role, especially in low income regions. Changes in productivity in these regions have helped them claw their way out of development traps. *Government expenditure on R&D* is not confirmed to be negatively associated to the risk of remaining in a DT in the fixed effects models, not even in high income regions. There is likely some time-invariant unobserved characteristic specific to these places that drives the relationship with government GERD documented in previous regressions. This is consistent with the hypothesis of an interaction between R&D support and the social, institutional, and economic context of the place benefitting from this measure. Hence, although support for research and development is a highly valuable policy tool, it does not represent a panacea for the economic resilience of regions and its use should be targeted.

- The results also confirm the findings on *human capital and S&T employment*: growth in both these measures is associated with a lower likelihood of remaining or becoming trapped. However, in low-income regions, it is S&T jobs that really matter. In middle- and high-income regions, by contrast, growth in the shares of workers with secondary education attainment (human capital accumulation) is more likely to lead to a greater capacity for EU regions to escape traps. Overall, this seems to confirm the hypothesis that, especially in low-income regions, human capital accumulation alone is insufficient to fend against the risk of stagnation, unless an environment is offered where the acquired skills can be put to productive use. It also appears that in the post-crisis period reductions in DT risks required employment of more resources in the knowledge producing sector, other things being equal.

- Perhaps somewhat surprisingly, we find that having a high *dependency ratio*, while an important potential cause of being in a trap in the first place, also increases a region's ability to come out of traps, a result driven largely by the dependency ratio linked to high shares of elderly population.[31] This is especially true for middle- and high-income regions, and in the post-crisis period. In poorer regions, it would even seem that growth in dependency ratios increases the DT index (although not in a statistically significant way at conventional levels). A rather speculative interpretation of this finding is that in richer areas, retired individuals can count on larger pensions, savings, and accumulated wealth that they spend locally in non-tradable services, which in turn helps sustain the regional economy. In poorer areas, instead, they might require private transfers and support from the younger generation, thus reducing their disposable incomes and subtracting resources from formal employment, potentially even dragging down the local economy.

- Finally, subnational *government quality* matters more as a region develops. In the extreme case of the European regions at the bottom of the development ladder, better institutional quality could even be detrimental for their capacity to claw out of a trap. This, however, concerns a very small group of regions.[32] For high-income regions obtaining a strong and high-quality subnational government represents a fundamental asset for improving the probability of coming out of a trap, as suggested by large (negative) point estimates.

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[31] This last claim is based on results not reported herein.
[32] In findings not reported in this document, we find that this result is driven largely by the bottom ten percent of regions. In these places, adaptation to changing institutional environments in the absence of a strong local economy appears to be disruptive at least in the short term.

Table 6 below tabulates the findings from all regressions discussed so far, giving a visual overview about their consistency, and highlighting potential differences across subgroups of regions by income.

Table 6: Tabular overview of main regression findings

		Pooled				Fixed effects			
		All	Low	Mid	High	All	Low	Mid	High
Economic structure	Industry (% Empl.)	-				-			-
	Non Fin. Serv. (% Empl.)			-		-			-
	Non Market Serv. (% Empl.)	+	+	+	+	+	+		
Productivity and innovation	Ind. productivity	-	-		-	-	-	-	
	Gov't GERD (% GDP)	-			-				
Human capital	Secondary ed. (%)		+		-	-		-	-
	Empl. in S&T (%)		-			-	-		-
Other	Dependency ratio	+	+			-		-	-
	EQI Index	-	-	-	-	-			-

Note: Only +/- signs were statistically significant. Empty cells in the table denote insignificant results.

5   CASE STUDY EVIDENCE

In-depth case studies are used to validate the quantitative findings. According to Flyvbjerg (2006) case studies are fundamental in order to verify and strengthen the results of the econometric analysis and provide the necessary depth to a proper understanding of the mechanisms behind the emergence of development traps. These case studies aim to identify what socio-economic factors are either assimilating or distinguishing different types of regional development trajectories. Aggregate evidence is compared with findings in the field, to corroborate and nuance the econometric analysis presented in the previous sections. Moreover, the case studies present prospects in order to help regions move out of the trap, as well as prevent regions from falling into it in the future. Evidence from these case studies thus provides valuable insights that are used to develop the policy recommendations, outlined in Section 6. Below, the methodology is briefly discussed and a synthesis of the main findings for each region is reported.

5.1 Methodology

The four case study regions included in the report were identified based on their overall representativeness and relevance to the objectives of this project. Geographical location and economic structure of the regions were considered, as well as development levels and stages in the development trap. The chosen regions have all displayed signs of being trapped or being at risk of falling into a DT, albeit at different levels of income. We cover a low-income region, Adriatic Croatia, two middle-income regions, Abruzzo (Italy) and Champagne-Ardenne (France), and a high-income region, South Sweden. In each region, a team of local experts helped us gather qualitative and quantitative information from the field. We relied on four main sources of information:

- Data and evidence obtained from the re-elaboration of project data. This evidence was provided as region-specific background information ahead of the case study (e.g., key economic indicators);

- Secondary quantitative data was obtained from local statistical offices and other local sources of information, as deemed relevant by local teams, in integration of data available through this project, and in support of the claims made in the case study;

- Primary data was collected in the field by means of interviews with key regional actors (further details on the interviews discussed below);

- Existing literature specific to the target region (whether in English or in the local language), appropriately referenced, was considered, including academic publications, policy reports, local government reports, white papers and other grey literature.

Figure 18: Geographic location of selected case study regions
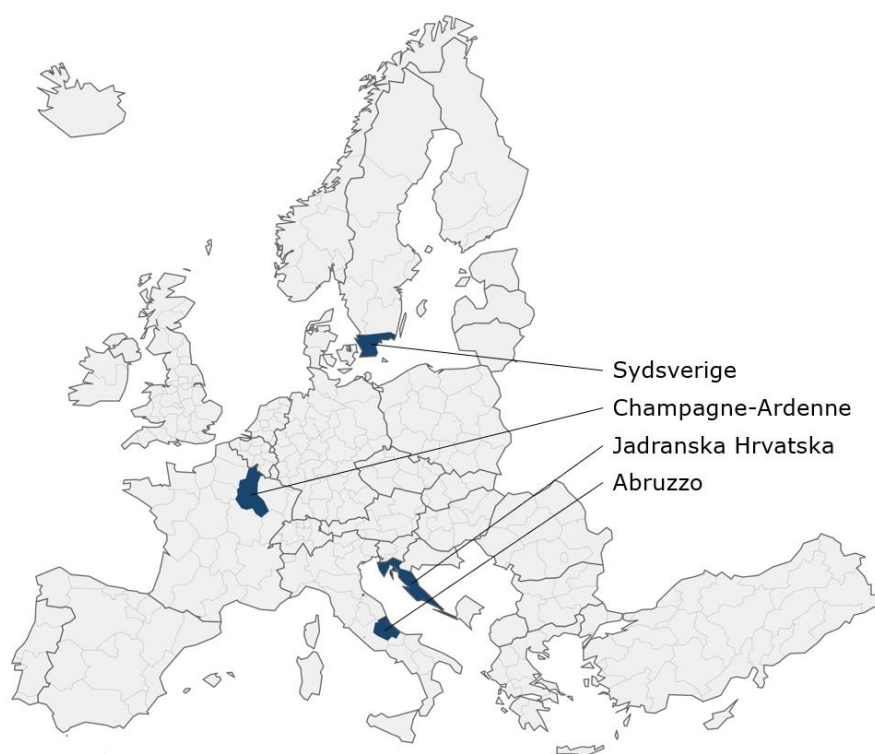
Overall findings were obtained by triangulating evidence drawn from these sources. One of the main contributions of the case studies is primary information obtained from interviews with key local actors. Insights from their knowledge and views is an important source of added value to this report. Key types of local actors interviewed were:

- **Decision-makers** – e.g., local government officials, civil servants, employees of local agencies, public managers, regional development actors;

- **Economic and social agents** – e.g., trade union representatives, heads of civil society associations, church leaders, civic groups, cultural associations, local advocacy groups;

- **Academic and independent experts** – e.g., Professors or lecturers in local universities specialising in subject-relevant fields.

At least one of each type of local actor was interviewed in each region, with at least five and up to nine in-depth interviews carried out for each case study. A list of

interview partners in each region is available in Table 21 in Annex. The interview format was semi-structured. At the beginning of each interview, the interviewer introduced the notion of development trap in a few words and presented the interviewee with a series of statistics and facts about the region in question, obtained from project data. A questionnaire was then provided as guidance for interviews with local actors, and as prompt for a conversation about the state of the regional economy and society (Table 22). At discretion of the interviewer and depending on the interviewee's core area of knowledge, the order of questions could change, as well as the level of detail used in follow-up questions. Interviewers were instructed to use follow-up questions to clarify statements, elicit examples, and obtain evidence for claims made by the interviewees. In addition, the interviewer could discuss supplementary questions as needed. The target time spent on each interview was about one hour.

5.2 Abruzzo, Italy

Category: middle-income region at high DT risk			
Economy		**Economic structure (% empl.)**	
GDP/capita (k EUR, 2005)	21.17	Agriculture	5.25
GDP/capita growth (y-o-y)	0.21	Industry	20.86
GVA/worker (k EUR, 2005)	48.46	Construction	9.20
GVA/worker growth (y-o-y)	0.45	Non fin. serv.	25.31
Empl./pop. ratio	0.39	Fin. and bus. serv.	10.46
Empl./pop. growth (y-o-y)	-0.20	Non market serv.	28.93
Demographics		**Innovation and other**	
Population (thousands)	1284.48	Empl. in S&T (%)	14.12
Population growth (y-o-y)	0.24	GERD business	0.39
Median age	41.49	GERD government	0.12
Primary ed. (%)	43.71	Patents/million pop.	35.32
Secondary ed. (%)	41.74	EQI (mean 0, stdev 1)	-0.73
Tertiary ed. (%)	14.54	Urban pop. (%)	14.73

Note: All figures computed as averages over 1990/91-2015. Exceptions are education, S&T employment, and GERD (1998/99-2015), EQI (1995-2015), and urbanisation (2004-2015).

5.2.1 Introduction and Context

Abruzzo has been a European region that succeeded in reducing its once significant per capita GDP gap with respect to the national and EU averages. However, it failed to catch up completely and was, between the mid-1990s and late 2000s, captured in a development trap. This trapping has eased somewhat in recent years, due to a better economic performance, above that of Italy, as a consequence of the strength of its industrial structure and of public investments aimed at reconstructing the region after the 2009 L'Aquila earthquake (Figure 19). This case study aims to shed light on the local conditions that may be associated with development traps at middle-income levels, at the same time adding further evidence on deteriorating and mitigating factors behind changes of DT risk over time.

**Figure 19: DT1 Index and DT2 Index (smoothed) in Abruzzo**
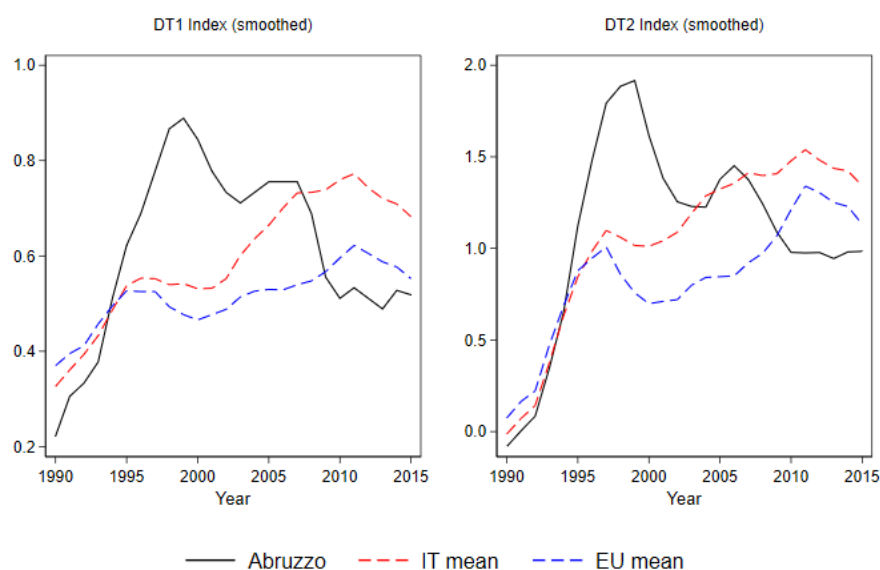
The matrix in Figure 20 reports all components of the DT measures separately for each year. Red (blue) cells denote poorer (better) performance compared to the benchmark. The colour shading reflects quartiles of deviation magnitude, computed over the distribution of all deviations in the region across all years. The chart allows assessing:

- Factors behind the trap: reading the matrix left to right gives an indication of how, within each year, different components contributed to the overall Index.

- Trends in each factor: reading the matrix from top to bottom shows how, over time, the region performed on a specific Index subcomponent.[33]

In the case of Abruzzo, it is immediately evident that the region's low DT values in the early nineties are driven by particularly good performance with respect to other EU regions in per capita income and productivity growth. However, starting in the late 1990s, these same measures started to lag behind not only with respect to the rest of the EU, but also compared to other regions in Italy. Abruzzo was also performing far worse than five years before. Interestingly, during this same time Abruzzo witness a relative acceleration in employment. In recent years, the improved performance of the region was driven primarily by the fact that Abruzzo outperformed Italy in income growth, productivity, and employment to population ratio. This deviation in performance can partly be ascribed to the strong reconstruction measures implemented following the devastating earthquake that struck the region in the spring 2009. What follows takes a more detailed look at the long-term development trajectory of the region.

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[33] Figure 59 in Appendix is another way of visualising this information using multiple time-series graphs.

**Figure 20: Accelerations/slowdowns and deviations from Italy or the EU**
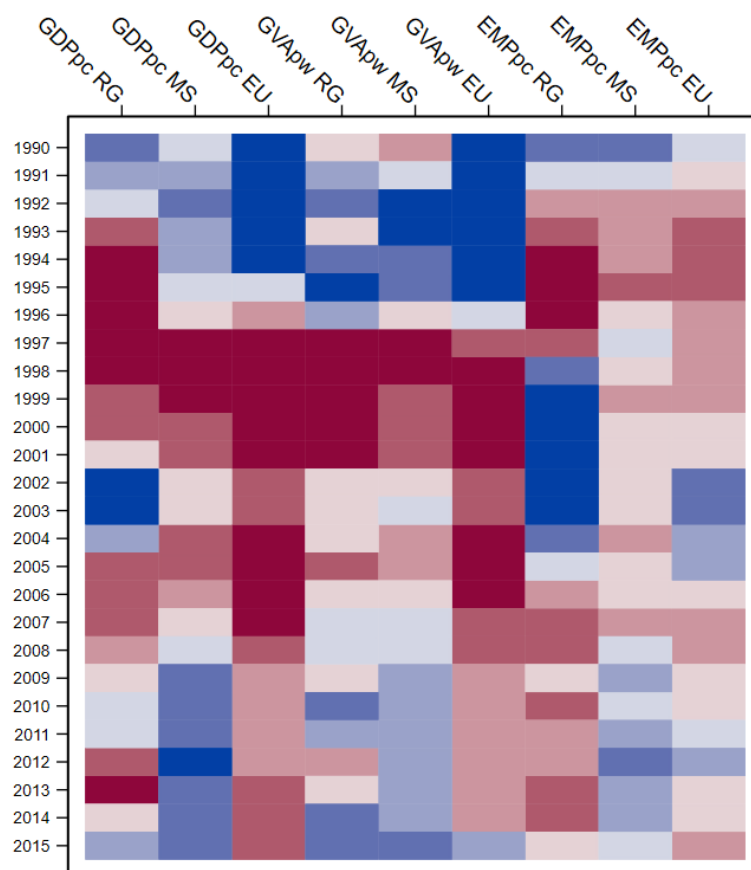
All deviations are expressed in percentage points for ease of reading
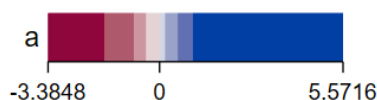
Starting from a particularly backward condition in the immediate post-war period, the Abruzzo 'miracle' unfolded between the 1960s and the early 1990s, spurred by national and European regional development policies, and by the region's relatively favourable geographical position in the centre of Italy and partially benefiting from the economic expansion of Rome. In the 1950s and early 1960s, per capita GDP in Abruzzo fluctuated around two thirds of the national average, and the delay in industrialization restrained development even below the rest of the Italian Mezzogiorno. The trend changed in the second half of the 1960s, when the region entered a rapid process of catching up towards the levels of GDP per capita of Italy and Europe. The catch up allowed it to outpace the Mezzogiorno and to rapidly converge towards the Italian average (Di Giacinto and Nuzzo, 2005). The process of industrialization was fostered initially by public-controlled companies, as well as by large private firms, including foreign multinational enterprises (MNEs), attracted into the region by the support of regional development policies, and mostly specialized in medium- and high-tech sectors, such as automotive, ICT and the pharmaceutical industry. Abruzzo was preferred to other Mezzogiorno regions because of its favourable geographical position, closer to the richest markets of Central and Northern Italy. Moreover, the quality of its transportation infrastructure improved as a consequence of the construction of new motorways, linking the Italian capital, Rome, to the main cities of the region, as well as the development of a north-south motorway along the Adriatic coast, servicing the main city in the region, Pescara, and some of

the most densely populated areas in Abruzzo. The provision of natural resources, particularly hydroelectric energy, played also an important role in triggering the development process.

Figure 21: Economic structure in Abruzzo
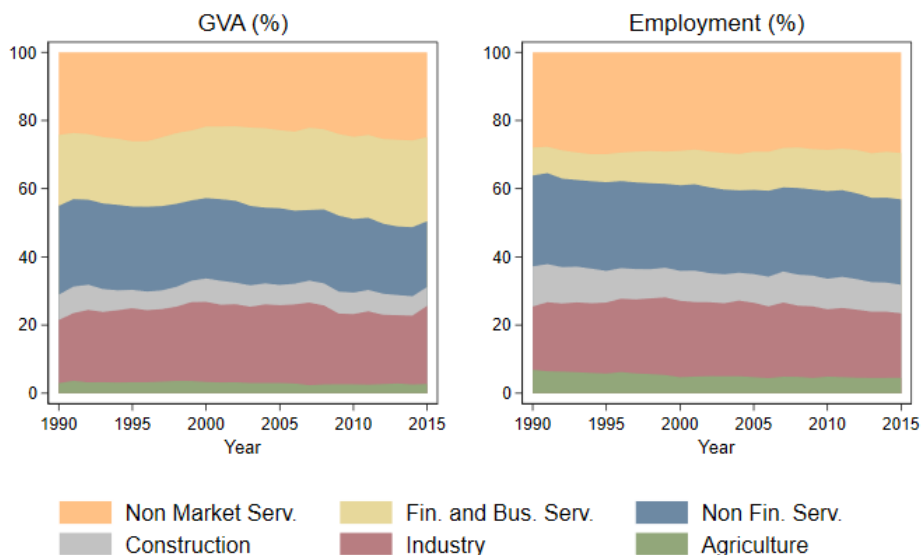
The exceptional economic growth in the two decades and a half that followed was mostly driven by increases in labour productivity, made possible by a deep transformation of the region's economic structure, which gradually specialised in the manufacturing industry, thanks, in particular, to investments by externally controlled firms (Figure 21). Later, a second engine of growth was added with the development of some local production systems made up mostly of small and medium sized enterprises (SMEs) specialised in traditional sectors. The process of industrialization was also facilitated by a favourable social environment, characterized by low crime rates and a good entrepreneurial propensity. In the early 1990s, GDP per capita in Abruzzo reached a peak of 92 percent of the national average, well above the Mezzogiorno average, which, despite considerable national and European investments, had continued to lose ground with respect to the rest of Italy.

Yet, after the region exceeded the eligibility threshold for the current less-developed status in terms of EU Structural Funds, losing its status as Objective 1 region in 1997 – at the same time in which also national funds for the Mezzogiorno were largely dismantled – the gradual loss of public support revealed the fragility of the Abruzzo entrepreneurial system. Local SMEs proved unable to face the higher competitive pressure exerted by developing and emerging economies in global markets. Moreover, the region's ability to attract FDI was weakened by the emergence of alternative opportunities in the new members of the EU. The development process came to a halt by this combination of adverse shocks, and relative GDP per capita started to decline. Abruzzo's economic performance slowed down in terms of productivity, employment and GDP per capita. The region became trapped.

Since 2005 the region has again showed some signs of economic dynamism, especially in terms of GDP per capita, productivity and employment relative to the Italian average. Despite some difficulties, it has also proved resilient to the economic damage caused by the 2009 earthquake shock. However, the sovereign debt crisis of 2012 and successive years has proven to be a shock too far. Moreover, Abruzzo's performance relative to the EU average – mirroring that of the rest of Italy – has been profound

and prolonged. It has declined from a GDP per capita of 111 percent of the EU average in 1992 to 77 percent in 2017, confirming that most other European regions have outpaced Abruzzo over the last two decades.

The spectacular catching up recorded between 1960 and 1992 was to a large extent achieved through rapid labour productivity growth, with a significant contribution coming also from increases in the employment rate. Consistently, a substantial fall in relative labour productivity (down to 87 percent of the national average) was the main culprit for the decline recorded by relative per capita GDP between 1992 and 2004, with a minor contribution coming also from the employment rate. By contrast, the reduction of the GDP per capita gap recorded between 2004 and 2018 does not reflect a recovery in productivity, but it is rather a combined result of moderate increases in both employment rate and working age share of total population.

Despite the weak regional industrial productivity compared to the national average, the most striking feature of the structural transformation of the regional economy is the importance of the manufacturing industry, which has been increasing between 1970 and 2018, both in terms of value added and employment. This is in contrast to the rest of Italy, where 'deindustrialization' has been the norm. Nevertheless, not everything in recent years has been more favourable in Abruzzo than in the rest of the country. For example, the service sector has grown more slowly in the region than in the rest of Italy, particularly with respect to knowledge-intensive business services (KIBS). The poor development of the advanced tertiary sector is partly the result of the urban structure of the region. With only one medium-sized urban centre (Pescara) and a predominantly external control of its industry, the demand for KIBS is generally limited and does not come so much from local manufacturing plants, but from their headquarters located in other regions or abroad.

Capital deepening and availability and quality of human capital are other factors behind the historical catching-up in labour productivity. Abruzzo has always remained above the national average in the rate of secondary education, which recently aligned with the EU average. The tertiary education rate has also been higher than the Italian average, although far from the shares recorded in the EU as a whole and in many competitor countries. This relative advantage has been facilitated by the presence of four universities in the region, which offer a wide range of education opportunities, with important strengths in scientific and technical courses. The region, however, shares with the rest of the Mezzogiorno a lack of high-skilled labour demand from the local entrepreneurial system, which has led to a substantial brain drain.

Turning to the main indicators of the regional innovation system, gross domestic expenditure in R&D has become over time even lower than the national average, which continues to lag far behind the EU average. In particular, business expenditure in R&D has been very low in Abruzzo, confirming the limitations of an industrial structure dominated by SMEs specialized in traditional sectors, and externally controlled firms, which until recently have not carried out R&D activities in Abruzzo. Public expenditure in R&D by universities and research centres, although significant, has been far from sufficient to offset the meagre private investment in R&D. This implies that Abruzzo generates a low number of patents per million inhabitants, even in comparison with other regions elsewhere in Europe with similar characteristics. Patenting experienced an upsurge in the 1990s but, since then, it has gradually fell well below the national and EU averages. More generally, the relationships and networks between external firms, local firms, research bodies and institutions, which characterise the most dynamic regional innovation systems, are insufficiently developed (OECD, 2013).

Abruzzo shares with the rest of Italy – and particularly with the rest of the Mezzogiorno – a range of complex institutional problems, which limit its economic growth potential as well as the quality of societal life. The inadequacy of the multi-level governance system – coupled with a rather fragmented organisation of the regional administration – is confirmed by the fact that, notwithstanding several previous reforms, the lack of efficiency of government and local administrations remains at the centre of heavy political controversies. Accordingly, Abruzzo is characterized by a poor institutional quality as proxied by the EQI. It remains well below the national average and has been in decline since records started.

5.2.2 Evidence and Perception of Development Traps

Most of the interviewees agreed that Abruzzo has been in a development trap, highlighting that the problems in regional economic growth emerged after the end of public 'extraordinary intervention' policies in the Mezzogiorno, and after the region became no longer eligible for the Objective 1 EU structural funds programmes.

The Great Recession, particularly in its second phase of the sovereign debt crisis, had negative effects on the local economy, which worsened its longstanding stagnation. In addition, Abruzzo is still facing the serious consequences of the earthquake that hit its capital, L'Aquila, in 2009, linked not only to the delays of the reconstruction, but also to the problems of rebuilding social ties and preventing the dispersion of local communities and the long-term depopulation.

The 2009 seismic 'crater' – the area most directly affected by destruction caused by the earthquake – represents a quarter of the region in terms of surface and was further extended with the earthquake swarm of Central Italy in 2016-17. This sequence of natural disasters in just a few years raged over the inner areas of Abruzzo, exacerbating what was already an unstable situation: the internal areas affected by the earthquake, in fact, were already suffering from economic and social fragility, as well as depopulation. Indeed, according to some interviewees, the post-earthquake reconstruction has been a missed opportunity to reposition the region on a new and more dynamic development trajectory based on sustainability, energy saving and urban regeneration.

The opinions of different interviewees converged on the view that the structure of the Abruzzo economy still reflects the type of industrialization carried out since the 1960s. The region has a longstanding comparative advantage in some sectors of high-tech manufacturing industry, such as the electronic and pharmaceutical sectors. This advantage, although weaker than in the past, remains important but based on externally-controlled firms that have failed to develop local networks of suppliers. At the same time, the weakness of KIBS represents, according to those interviewed, another critical drawback of the region's model of specialisation. Overall, the structure of the Abruzzo economy is not innovative enough and this is reflected in the relatively low demand for skilled workers. The risk of accelerating jobs' obsolescence may become more severe if the digital transformation of the industry was to be exploited only with a view of reducing costs, without aiming at improving skills.

Despite the wide diffusion of tertiary education in the region, skill mismatch and lack of opportunities are behind outflows of young people from Abruzzo. This adds to the problem of galloping aging, which is only partially mitigated by the entry of new residents, who are mainly young foreigners. A further issue that emerged from the interviews is the poor quality of technical colleges in Abruzzo, which is representative of a more general problem of the Italian education and vocational training system.

Consensus emerged also in relation to the international integration of Abruzzo. With the end of public support and the change in the external environment, the FDI attractiveness of the region weakened, even if most MNEs that came to the region during the expansion period remain there. However, one of the major constraints is represented by Abruzzo's SMEs. These are perceived to be not strong enough to compete in international markets and to participate in global value chains (GVCs). For example, globalization has rapidly overturned the subcontracting business model of the Val Vibrata clothing district, in the province of Teramo, which in the past had been highly successful. According to most interviewees, the inadequacy of the railway and airport network does not encourage external companies to invest in the territory. Other problems stem from the small size of most firms, which makes them unable to meet foreign demand, as well as from the lack of the necessary capacity to start export activities because of linguistic or organisational shortcomings.

Most interviewees pointed to the inadequacy and ineffectiveness of the region's ruling class. Even when some strategic choices were designed and implemented, they have not been pursued with the necessary continuity, because of misalignment in policy directions and objectives between different legislatures.

However, some of the interviewees, particularly from the business community, have expressed a more optimistic view of the Abruzzo economic situation, perceiving the region not as a trapped one, but rather but at the beginning of a recovery phase. This brighter perception is based on the indisputable strength of Abruzzo's economic structure. Interviewees stressed the significant specialization in the manufacturing industry, with a relatively wide sectoral diversification, as an asset that should be preserved and upgraded. Examples of industrial excellence that were reported and discussed in the interviews were, first of all, the automotive and mechatronics district based in Val di Sangro (province of Chieti), pivoting around the large Sevel (FCA-Peugeot) plant, producing industrial vehicles, as well as on the Honda motorcycles factory and smaller specialised vehicle producers, such as Tekne. A second area of strength is the ICT-aerospace industry, located mainly in the province of L'Aquila. It includes the LFoundry plant in Avezzano, acquired in 2019 by the Chinese group Wuxi Xichanweixin Semiconductor; the Telespazio's 'Piero Fanti' Space Centre, which is recognised as the world most important teleport for civilian use; and other important companies such as Thales Alenia Space, and the new Leonardo plant for the design and certification of identification systems on military and civil aircraft. Because of the intense cooperation between these firms, the university system and local institutions, L'Aquila was selected as one of the five Italian cities for the experimentation of 5G technologies and 'smart city' applications. A third sector in which Abruzzo hosts important manufacturing sites, with strong linkages with the regional research system, is the pharmaceutical industry, which is present near L'Aquila with plants owned by Dompè, Menarini and the French group Sanofi. Additional industrial strength can be also found in the domain of life sciences (e.g. Valagro, in the province of Chieti), disposable hygiene products (e.g. Fater, a multinational joint-venture based in Pescara), and the strong local participation in GVCs in goods and services required by mining companies, developed thanks to the oil and natural gas resources of the Adriatic Sea and the coastal areas (examples of firms are Proger, Micoperi Blue Growth, and Walter Tosto). Finally, among traditional sectors dominated by local SMEs, the most important one is the agri-food industry, specialised in the production of pasta and wine (Montepulciano d'Abruzzo), with brands well-known in international markets.

Overall, the anecdotal information about strengths and opportunities of the regional industrial system is not easy to reconcile with the statistical evidence and the

perceptions of most interviewees about the development trap in which the Abruzzo region has apparently been caught in the last decades.

5.2.3 Factors Associated with Development Traps

Despite some optimism among the interviewees – coming in particular from business representatives – the majority of the regional actors' perceptions converge on the view that Abruzzo can easily be classified into the group of European regions identified in the report as formerly lagging behind, achieving middle-income levels 'from below', but then slipping back to a lower level of development.

A number of factors align Abruzzo with regions in development trap. Demographic trends appear consistent with expectations for regions in development traps: Abruzzo is characterised by an ageing population, particularly in the inland areas of the region, and increasing depopulation.

A major feature behind economic dynamism is the lack of innovative capacity – and, more generally, of a functioning innovation system – which limits the competitiveness of their firms in advanced and knowledge-intensive goods and services and hampers the potential for diversification and upgrading of existing economic activities. This is also behind the low demand for highly qualified workers from local SMEs, still characterised by business models based on production quantity, rather than quality, efficiency and innovation. In addition, the dearth of linkages and networks between MNEs, large and small firms prevents the development of spillover-effects and collective learning processes and foments the persisting weakness of the regional innovation system.

From the perspective of institutional quality, the Abruzzo case is more difficult to assess, because of the contrasting information conveyed by "objective" measures of the quality of governance and by indicators of their perception.

Finally, the literature about regions in development trap finds that they are often characterised by a limited ability to attract FDI, as well as by problems in the international competitiveness and integration in GVCs of their SMEs. From this perspective, Abruzzo can be considered as a paradigmatic case of the strong interdependence between international integration, in all its aspects, and local development.

5.2.4 Policy Tools

The Abruzzo region has long been considered an integral part of the Mezzogiorno, which has historically been the target area of regional development policies in Italy. In the 1950s, the first phase of the 'extraordinary intervention' policies managed by a special agency called *Cassa per il Mezzogiorno* (Casmez) was mostly devoted to building the fundamental infrastructures needed to reduce Southern Italy's gap with respect to the rest of Italy.

The second phase of Casmez intervention, starting from the 1960s, was directly aimed at promoting industrial development, leading to the establishment of large capital-intensive plants, controlled by external firms, whereas limited attention was paid to local SMEs. These policies have played an important role in shaping the industrial structure of the Abruzzo region and triggering its catch up in GDP per capita.

The Abruzzo economy has been one of the main beneficiaries of EU Structural Funds in the Mezzogiorno, as long as it remained eligible for Objective 1 support. More recent examples of how EU Structural Funds have been used to promote regional development in the region include the support to the establishment of Regional

Innovation Poles, aimed at connecting firms, universities and research centres, in order to stimulate knowledge creation and diffusion. Fourteen Regional Innovation Poles were created under this programme, but few of them are still active and serious doubts surrounding their actual effectiveness remain.

The reform of EU cohesion policies led to the adoption of regional *smart specialization strategies* (S3), which are based on a new theoretical framework aimed at achieving a long-needed convergence between regional development and innovation policies. Using correctly the 'entrepreneurial discovery' process envisaged by this new approach, five domains of specialisation were identified: Automotive/Mechatronics, Life Sciences, ICT/Space, Agrifood and Fashion/design, which broadly correspond to the strongest parts of the regional industrial structure. The strategy has involved local production systems and also representatives of the MNEs already established in the region. The idea that inspires its long-term vision is to make Abruzzo the "region of sustainable industry".

It is too early to say to what extent these policies have achieved their development targets, as no serious impact assessment has been conducted so far and because of the increasing uncertainty of the international context. However, Abruzzo can rely on very important assets, including not only its industrial structure, but also its extraordinary natural and artistic heritage. Regional development policies should be aimed at better exploiting this endowment, by facilitating knowledge creation and diffusion, thanks to an upgrading of the regional innovation system and an effort to further increase the international integration of the regional economy.

5.3 Champagne-Ardenne, France

Category: middle-income region at high DT risk			
Economy		**Economic structure (% empl.)**	
GDP/capita (k EUR, 2005)	24.37	Agriculture	7.65
GDP/capita growth (y-o-y)	0.33	Industry	17.66
GVA/worker (k EUR, 2005)	54.95	Construction	5.97
GVA/worker growth (y-o-y)	0.68	Non fin. serv.	20.88
Empl./pop. ratio	0.39	Fin. and bus. serv.	12.30
Empl./pop. growth (y-o-y)	-0.09	Non market serv.	35.53
Demographics		**Innovation and other**	
Population (thousands)	1348.50	Empl. in S&T (%)	14.40
Population growth (y-o-y)	-0.03	GERD business	0.52
Median age	37.98	GERD government	0.01
Primary ed. (%)	37.07	Patents/million pop.	55.08
Secondary ed. (%)	42.88	EQI (mean 0, stdev 1)	0.05
Tertiary ed. (%)	20.06	Urban pop. (%)	22.35

Note: All figures computed as averages over 1990/91-2015. Exceptions are education, S&T employment, and GERD (1998/99-2015), EQI (1995-2015), and urbanisation (2004-2015).

5.3.1 Introduction and Context

The Champagne-Ardenne region is located at the northeast of France, between Paris and Belgium. It used to be a prosperous region, chiefly because of its strong industry (metallurgy and textile) and agriculture (wine, cereals, sugar beet). Champagne-Ardenne is also well-known for producing the famous Champagne wine, exported worldwide. However, similarly to other old French former industrial regions, it has suffered from deindustrialization and automatization. The region displays many of the typical characteristics of regions stuck in a development trap, such as a stagnating or relatively decreasing GDP per capita, population ageing, low GERD/GDP ratio, or skills mismatch. Our Index measures suggest that the region has been increasingly in or at risk of a DT at least since the mid-1990s (Figure 22). The region is a good example of

places that, once prosperous, are approaching a development trap 'from above' due to persistent stagnation. Champagne-Ardenne still ranked fifth in France in income per capita in 2012, after Ile-de-France, Rhône-Alpes, Provence-Alpes-Côte d'Azur, and Alsace (Direccte 2014). However, persistent stagnation and even decline in GDP/capita since the 2000s meant that the region today trails France and the EU.

This case study aims to confront the aggregate findings of the report with local statistics and perceptions from local stakeholders. It broadly validates results on the local characteristics associated with being in a DT, despite some significant sub-regional variation among the Departments that make up the region. Aube and Marne, for instance, are often better-off than Haute-Marne and the Ardennes. The case study also shows that there is a clear awareness among local stakeholders of actions and policies that are needed to escape this trap. In this regard, the importance of developing higher education was emphasised as one of the key priorities in order to break out of the trap.

**Figure 22: DT1 Index and DT2 Index (smoothed) in Champagne-Ardenne**
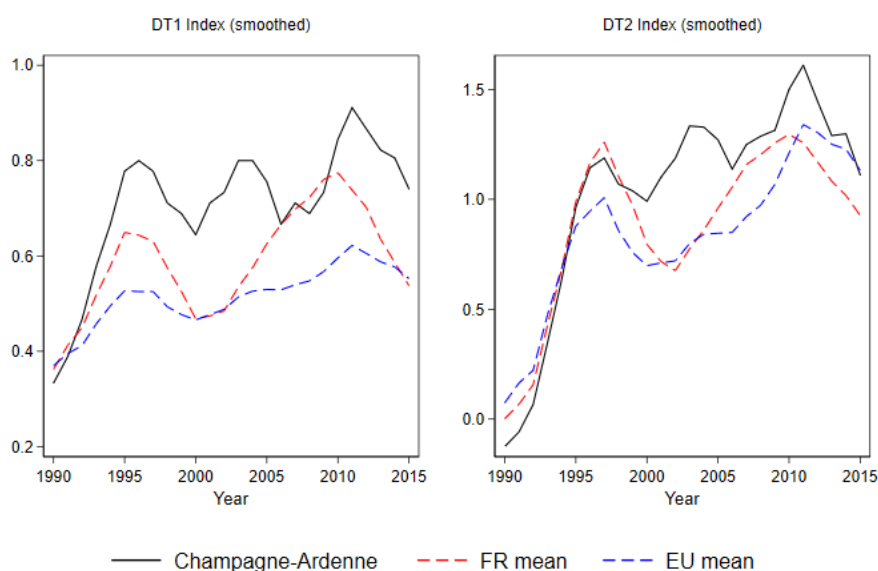
Similar to other case studies, we give additional insight into the development trajectory of this region by decomposing the DT measure into its subcomponents, and tracking performance against these over time.[34] Following a bout of relatively strong economic performance in the early 1990s, Figure 23 highlights the sharp deceleration in income and job growth in the region, and the intermittent pattern of acceleration/deceleration spells also characteristic of middle-income traps at national-level. Lacklustre performance compared to the rest of France or the EU is evident too, especially with respect to growth in income per capita. From 1990, real GDP in Champagne-Ardenne grew by 0.7 percent per year, twice slower than the national growth on the same period (1.5 percent), according to Van Lu (2014). The study ranked Champagne-Ardenne as the 19th French region in terms of GDP growth, as part of a group of regions located in the north-eastern quarter (Lorraine, Picardie, Alsace, Bourgogne, Franche-Comté) and centre of France (Centre, Limousin, Auvergne), all sharing similar features. The impact of the 1993 and 2008-2009 recessions has also been much stronger in Champagne-Ardenne than in the rest of France, highlighting the limited economic resilience of this region, largely owing to the specialisation of its economy in agricultural and agri-food processing activities.

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[34] See section 5.2.1 for the explanation on reading the matrix. **Error! Reference source not found.** in A ppendix is another way of visualising this information using multiple time-series graphs.

Champagne-Ardenne notably displayed the strongest decrease in GDP among French regions between 2008 and 2010, at the beginning of the Great Recession (Van Lu, 2014). Economic growth did not resume until 2011 and was, for long, insufficient to restore pre-crisis income levels (Van Lu, 2014). The region had seen small gains in labour productivity, particularly in the years leading up to the 2008 crisis, mainly because of innovation and technical progress, the emergence of new and more competitive clusters, the externalisation of the tertiary activities of the main local industries and the development of temporary employment (Van Lu, 2014). However, the crisis wiped most of that progress out. Encouragingly, the region's productivity growth has been largely aligned to that of France, occasionally even outperforming it during the 1990s, mid-2000s, and more recently in 2015. Employment growth as captured by the employment to population ratio has also been aligned to the French one, with bouts of regional acceleration in the early 1990s and around the turn of the century. However, between 2008 and 2011, 14,300 jobs were lost in the non-farm business sector, among which 13,300 in industrial occupations (Loiseau, Saliou and Wallaert, 2014). During the same period the rate of unemployment grew from 7.7 percent to 10 percent (Loiseau et al., 2014).

Figure 23: Accelerations/slowdowns and deviations from France or the EU
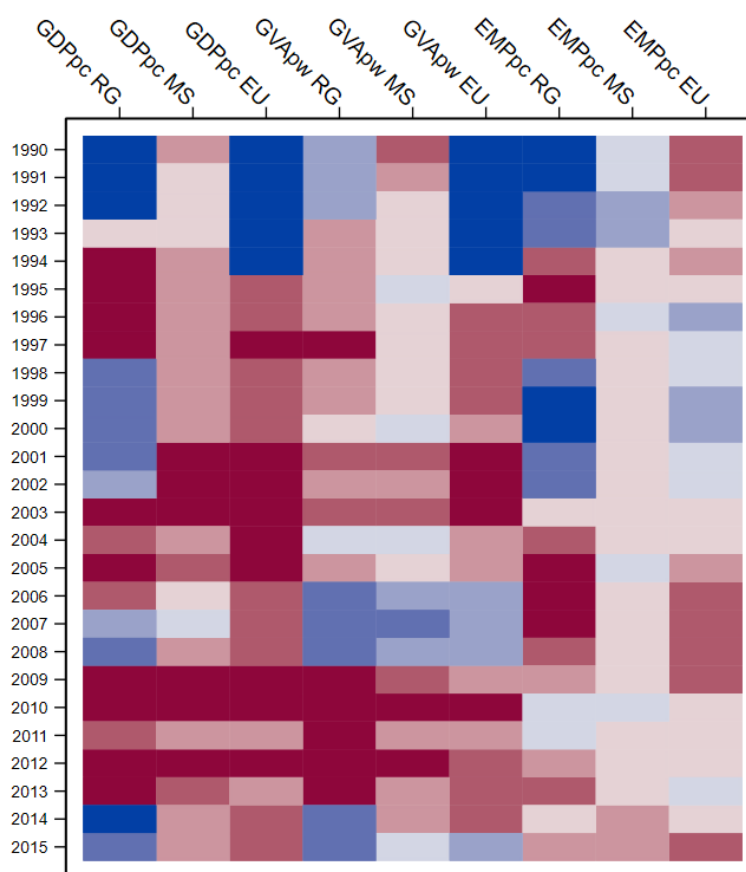
All deviations are expressed in percentage points for ease of reading
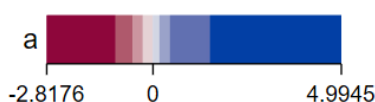
Champagne-Ardenne displays features associated with development traps also in terms of other socio-economic indicators, albeit with significant sub-regional variation.

The poverty rate is higher in Champagne-Ardenne than in France. In 2011, Champagne-Ardenne ranked as the sixth most disadvantaged region in the country

(Loiseau et al., 2014). Within the region, Ardennes had the highest poverty rates (19.2 percent), while the poverty rates in the departments of Aube (15.4 percent) and Haute-Marne (15.6 percent) were closer to the national average. Marne was the only department with a poverty rate (13.5 percent) lower than the national average (Loiseau et al., 2014), although it is today higher than in the rest of France. In demographic terms, the population of Champagne-Ardenne reached its maximum level in the 1990s and has since stagnated or even decreased, a trend characterised as 'structural decline' (SRADDET Grand Est, 2019). This trend however is not homogeneous across the region, with Aube and Marne showing small gains. However, the population is steadily decreasing in Haute-Marne and the Ardennes (Martini and Nieto, 2018). This structural demographic decline is accompanied by economic decline across a wide geographical axis that has become known as the 'fragility scarf' (SRADDET, 2019: 89). This area extends beyond the border of Champagne-Ardenne, reaching Wallonia to the north and Franche-Comté to the South.[35] Educational attainment is also lower in Champagne-Ardenne than in the rest of France, notably with fewer students completing tertiary education compared to France and the EU. The region, moreover, displays limited ability to innovate. In terms of inputs, gross expenditure in R&D is much lower in Champagne-Ardenne than in France and the EU, paralleled by low employment in the Science and Technology sector. Likely as a result of this, the number patents per inhabitant is also much lower in Champagne-Ardenne than in France and the EU. Noteworthy of mention is also the limited access to medical services by residents of this region. Champagne-Ardenne is affected by a lack of doctors on its territory, notably in Haute-Marne, Aube and the Ardennes. Most of these areas display a level of potential consultations per year and per inhabitant below the national reference threshold (SRADDET Grand Est, 2019).
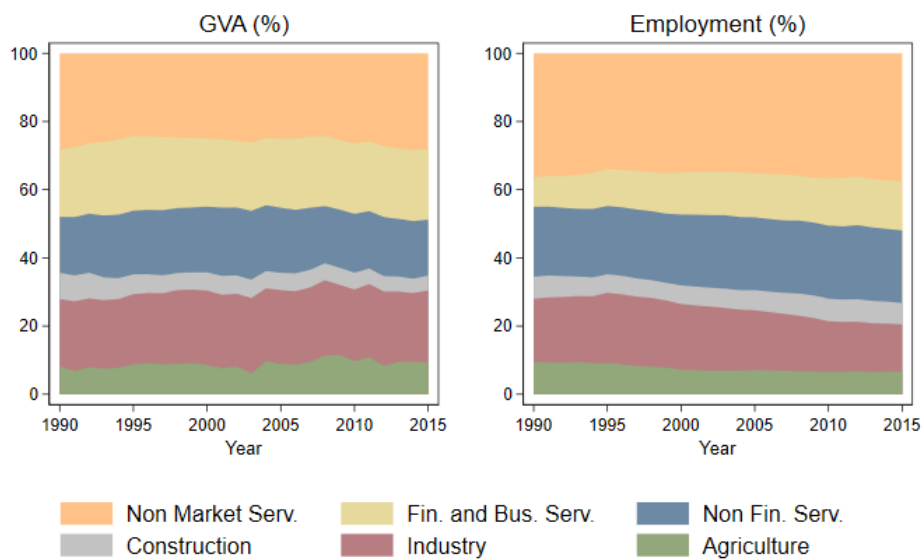
Figure 24: Economic structure in Champagne-Ardenne

Figure 24 displays the structure of economic activity in Champagne-Ardenne over time. Reflecting its predominantly rural character, the region relies heavily on agriculture in terms of overall GVA, compared to other European regions. In 2011, it ranked first in mainland France for agricultural GVA (Loiseau and Saliou, 2014). It has also seen declines in the shares of employment in both agriculture and industry (especially the latter), compensated by an expansion of non-market services and, partly, financial and business services. Overall, Champagne-Ardenne displays a highly

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[35] Franche-Comté is a former region that merged with Bourgogne in 2017 to form the Bourgogne-Franche-Comté region.

specialised economic structure not only in terms of broad sectors, but also within each of these sectors. In 2011, it was the third most specialised region in France, after Corsica and Ile-de-France (Loiseau and Saliou, 2014). This is mainly explained by the strong orientation towards agriculture, agri-food industry and fabrication of industrial products, but also by the little representation of tertiary activities.

Because of the importance of agriculture in Champagne-Ardenne, the agri-food industries play an important role in the local economy, notably in the areas of wine, sugar, cheese, meat transformation and conservation, bakery and pastry, and animal feed (DREAL, 2016). Some of the actors of the agri-food sector in Champagne-Ardenne are multinational companies, such as Vivescia (cereals), Soufflet (cereals), Cristal Union (sugar) and Tereos (cereals, sugar, potatoes). Winemaking is a fundamental source of income in Champagne-Ardenne, owing to a large international export market. In 2013 the production of Champagne accounted for more than 10 percent of regional GDP (DIRECCTE Champagne-Ardenne, 2014). Many of the winemakers are small, employing fewer than 10 people. However, middle-sized producers have increasingly been bought by national or multinational companies over the past decade, which, according to some interviewees, may reduce the potential for local reinvestment of revenues. There is also an important biorefinery activity in the region, with Reims posting to the European Institute for Biorefinery. Also features a bioeconomy competitiveness cluster, with two of the main agri-food companies in the region – Cristal Union and Vivescia – having invested in a research office in order to develop bioeconomy patents. According to one of the interviewees, the bioeconomy sector can contribute to the future development of the region.

The rest of the regional industry is also highly specialised. Historically, the most important industrial sectors in Champagne-Ardenne were metallurgy and metal processing. Today, the region is host to MATERALIA, a metalworks competitiveness cluster encompassing more than 140 industrial and academic members and aiming at defining strategic priorities for the energy, aeronautics, automotive, and medical industries (DIRECCTE Champagne-Ardenne, 2014). Metallurgy greatly contributed to the wealth of the region in the past, but this sector has been deeply affected by the 2008 economic crisis, which has accelerated an already steep decline. The number of employees in this sector decreased by 2.2 percent per year on average between 1990 and 2011. One of the interviewees stressed that metallurgic companies that survived have focused on niche markets where they have become highly competitive. Another formerly significant industrial sector is that of textile, clothing, shoes, and leather production. Today, however, few companies have managed to survive foreign competition that relies on cost advantages in labour inputs and large-scale production. Overall, the sector has rapidly declined. One company that represents a notable exception is Tecsom, a Sedan company specialising in carpeted floors, which managed to specialise in a niche market where it remains competitive. Tecsom provided flooring to the new Daxing airport in Beijing, inaugurated in 2019. Champagne-Ardenne also features a small but growing renewable energy cluster and a research laboratory on deep geologic storage of nuclear waste (within the National Agency for Radioactive Waste Management, ANDRA).

Champagne-Ardenne is strategically located near to the European core, at the crossroads of several trade corridors (Bosserelle, 2001: 20). This position of Champagne-Ardenne within the European Union is generally considered an advantage, since it gives a direct access to the most populated, urbanised and wealthier markets of Europe. However, the proximity to Paris has more ambivalent aspects as the region suffers from a polarisation effect towards Paris. This is especially true in a strongly centralised economy such as France. Because of its central geographical location, transportation and logistics are relatively well developed in Champagne-Ardenne. However, the sector was negatively affected by the 2008 economic crisis and by competition from neighbouring countries, combined with increasing in oil prices (DREAL, 2016). In terms of local connectivity, public transport is unevenly distributed in Champagne-Ardenne. While the Marne and Ardennes departments are well served

by public transport, in Haute-Marne car remains the main means of commute. The Aube department is rather well connected to Paris, but it has little or no connection with the rest of Champagne-Ardenne. For instance, Reims and Troyes, which are the two biggest and most dynamic towns in Champagne-Ardenne, are not directly connected to each other by train. This further strengthens the attraction of local urban centres towards Paris, leading to segmentation and fragmentation of local labour markets.

Finally, the quality of local governments is relatively low. The region lagged behind both France and Europe in the EQI measure until the mid-2000s, when it approached EU levels. Despite a sustained increase in this measure since 2010, the region was still below the French average in 2015.

5.3.2 Evidence and Perception of Development Traps

Locally gathered evidence emerging from the literature, regional data, and interviews, largely confirms that Champagne-Ardenne can be considered to be in or at risk of a development trap, albeit with some sub-regional variation as well as confuting evidence.

The region displays many of the tell-tale signs of a development trap. As already mentioned, Champagne-Ardenne has been experiencing demographic decline since the 1990s. This lack of demographic dynamism is partly due to a negative migration balance, especially affecting young courts, which contributes to the ageing of the population. There is also a very low contribution from natural increases to the balance of population in Champagne-Ardenne, especially in Haute-Marne and the Ardennes (SRADDET Grand Est, 2019). The proportion of people aged 65 years old and more is forecast to significantly increase in the region in the coming years, from 17.4 percent in 2011 to 27 percent in 2040 (SRADDET Grand Est, 2019). In Haute-Marne for instance, nearly 13 percent of inhabitants are older than 80, which is significantly higher than the national average. The trend is not homogenous across the region, as there is larger proportion of young people in the Aube and Marne departments (SRADDET Grand Est, 2019). Most young people, however, leave Champagne-Ardenne to pursue studies in other parts of France or even abroad. Combined with the limited ability of the region to attract and retain talent due to lack of local opportunities, the interviewees stressed that this dynamic contributes to "a spatial segregation that deepens social segregation". According to their view, sustained demographic decline is perhaps the foremost indicator of the trapped status of the region.

Another important sign of trapped status is the closure or merging of local firms. The interviewees have highlighted that important companies in Champagne-Ardenne have closed these last decades, in particular in the traditional industrial sectors. One of the most striking examples is the closure of the Electrolux washing-machine factory at Revin, in the Ardennes. This production plant had been in continuous operation since 1882. In 1976, the production site (Arthur Martin, at the time) employed 3600 workers in Revin. However, it began to decline in the 2000s, when Electrolux relocated the lower range of its activities to Poland and moved the development department to Italy. In 2012, Electrolux announced its intention to relocate all its washing-machines production to Poland (Cosnard, 2018). There has been a similar case in the Marne department, when the American group Itron announced in 2020 the closure of its Reims factory that produced gas meters. According to some of the interviewees, the industrial companies that have survived are those that managed to modernise and automate production, increasing plant productivity and preserving competitiveness. These cutting-edge, high-tech industries, however, are not a strong source of employment creation.

Parallel to the closing and merging of local firms, the region has also witnessed a sustained loss of jobs, notably in its traditional industries. The region has lost 17,100 jobs in agriculture between 1990 and 2011 (an average decline of 2 percent per year),

while the industry workforce declined by over 25 percent between 2001 and 2011 (Loiseau and Saliou, 2014; DREAL, 2016). By contrast, the tertiary sector gained 56,500 jobs between 1990 and 2011, predominantly because of public sector employment, the development of temporary employment (referred to as 'interim' employment in France) and the externalisation of some service activities by the industrial sector (Van Lu, 2014).

Finally, the interviewees highlighted that there is also a skill mismatch in the region. Local companies have difficulties finding a workforce capable of fulfilling their needs. Local authorities and chambers of commerce and industry have an important role to play to better adapt the training offer to the specific skills demanded by local companies.

Alongside the evidence supporting the hypothesis of a development trap in Champagne-Ardenne, the interviewees also pointed at some encouraging features of the local economy, on which future development strategies could build. The region displays openness to international trade, with an overall positive trade balance. Exports of Champagne-Ardenne amounted to EUR 10.7 million in 2013, nearly 60 percent of which was generated by the Marne department, about 20 percent by the Ardennes, with the remaining 20 percent shared between Aube and Haute-Marne (DIRECCTE Champagne-Ardenne, 2014). The most international sector of the economy of Champagne-Ardenne is the production of Champagne wine, with an export share of 50 percent (DIRECCTE Champagne-Ardenne, 2014). The region also displays levels of investments comparable to those of France, and significantly higher than the EU average. Finally, business creation has gained momentum since 2015, as highlighted by one of the interviewees, which could signal a certain dynamism of the region. Nevertheless, this momentum is in line with national trends and there are important sub-regional variations across departments. Only Marne and Aube outpaced France in the creation of new businesses between 2010 and 2015 (INSEE, 2018).

5.3.3 Factors Associated with Development Traps

Champagne-Ardenne can be well-described as an old industrial region. The region was performing strongly in metallurgy and textile sectors but has suffered from a sustained deindustrialisation in recent decades. This decline in manufacturing activity has impacted employment and was associated to a decline in population. Champagne-Ardenne has experienced difficulties in restructuring its economy, while the transition towards service jobs has been slow. Furthermore, the region has quite unsatisfactory educational attainments, especially for tertiary education. Champagne-Ardenne perfectly fits the description of a "formerly well-off region" that "moved into prolonged periods of relative economic decline, bringing levels of GDP per capita to below EU average".

Partly, this unfavourable dynamic is a consequence of macro-level factors. As highlighted by one of the interviewees, the slow decline of old industrial regions is a trend that goes beyond the borders of Champagne-Ardenne. In France, it affected all former industrial strongholds, which are mainly located in the northeast quarter of the Hexagon. Moreover, France remains mostly a centralised country. This centralisation has deeply and negatively impacted second-tier cities and towns in France. In addition, the decentralisation acts that began in the 1980s spurred a 'metropolisation' phenomenon in France. This trend is mainly associated with the development of high-speed rail networks, as well as the promotion of academic concentration. Intermediary networks such as those formed by smaller towns lost importance. In this regard, Champagne-Ardenne suffered from the absence of large urban areas on its territory. The prominence of agricultural land and the proximity of Paris contribute to explaining this absence. Somewhat telling is the fact that Reims, the most populous city in the Marne department, is colloquially known by the nickname of 'the Sleeping Beauty'. Its relatively low density may be a factor preventing firms from benefitting from agglomeration economies, partly explaining the limited development of a dynamic

tertiary sector in the region. The extension of the high-speed rail (TGV) to Reims in 2007 has not improved its position, contributing instead to increase its dependence on Paris and shifting economic activity outward around the town of Bezannes, where the TGV hub is located.

There are however also important internal regional determinants to its trapped status. The main factor explaining the low dynamism of the in Champagne-Ardenne is its specialised productive fabric, which is much more oriented towards industry and agriculture than elsewhere in France. This high degree of specialisation makes the region more vulnerable to conjunctural shocks. Moreover, the transition from industry to high-skilled and high value-added activities has been too slow to compensate for the erosion of traditional sources of growth and employment. Local reliance on non-market services also played a role in the past, as confirmed by some of the interviewees. Some parts of the region relied heavily on public sector jobs and suffered from their loss due to relocation in recent times. This was the case in Châlons-en-Champagne, for instance, which is the administrative capital of the Marne department – and formerly also the administrative capital of the entire Champagne-Ardenne region. The town hosted a large military regiment, which however closed in 2015, depopulating the area of over one thousand military personnel with their families. In addition, the recent territorial reform merging Champagne-Ardenne with Lorraine and Alsace is likely to further accentuate the decline of the region. The choice of Strasbourg as the administrative capital of the newly created Grand Est region has represented a significant shock for Châlons, in particular, and shifted the balance of power to the east. The former regional council and former regional prefecture in Châlons have closed. These closures have been followed by the departure of regional headquarters of several public companies and banks, both in Châlons and elsewhere in the region. More generally, the region suffers from a lack of interaction between its economic actors, small markets, limited local demand, and low levels of urbanisation (Van Lu, 2014).

One final set of explanations concerns soft factors. Owing to the prosperous past of Champagne-Ardenne, the interviewees highlighted that there remains an engrained and widespread perception in the region that prosperity will come back. According to one of the interviewees, this perception leads to a certain inertia and explains why some improvements happen with delay in Champagne-Ardenne. In addition, the region was historically exposed to wars due to its strategic location at the heart of Europe. Some of the interviewees claim this strongly impacted the economy and the state of mind in Champagne-Ardenne. After the Second World War, for instance, the French State decided to avoid economic investments in the northeast quarter of the country as it was destroyed by armed conflict multiple times in the past. This allegedly also promoted a fatalistic vision among the population of Champagne-Ardenne, which discouraged entrepreneurship and sense of belonging to the region.

Regarding consistency of local factors with aggregate findings, the case study largely confirms what was discussed in Section 4.3, especially with respect to the importance of economic structure, demographics, and human capital. Firstly, the region has not been able to operate a large-scale upgrading of its economic structure. While the weight of the industry in the GVA has remained mostly stable in Champagne-Ardenne, its share in total employment has decreased steadily. Furthermore, reliance on non-market services is also prominent in this region, endangering prospects of sustained development and exposing the region to risks of sudden relocation of these activities. Demographics also feature prominently in this picture, as evidenced by sustained decline and net migratory loss, with many young cohorts leaving and population rapidly ageing. Finally, low shares of tertiary educational attainment, along with mismatch of skills at all levels, contribute to reinforcing its low development potential.

5.3.4 Policy Tools

Policy has played an important role in shaping the development trajectory of Champagne-Ardenne in the past and will certainly continue to do so in the future. The stakeholders interviewed displayed a clear awareness of the scope for policy intervention. Despite the challenges the region faces, some interviewees were somewhat optimistic about the prospects of Champagne-Ardenne.

Prominent past policies focused on **promoting human capital accumulation**, **improving accessibility**, and **optimising local governance**. In 1994, the department of Aube founded the Troyes University of Technology (UTT), as part of a network of three universities of technology created by the Compiègne University of Technology (former Picardie region). The UTT has three missions: research, training and technology transfer. It acts as an engineering school and delivers master's degrees and PhDs. The UTT has adopted an original teaching method with course choices, links with industry and traineeships. One of the interviewees, closely involved in the process, attested the good cooperation with local firms. Moreover, the UTT has developed close ties with the international academic community (183 partnerships with international universities in 2015) and welcomes 24 percent of foreign students (Conseil départemental de l'Aube, n.d.). In 2017, the UTT was training 2,900 students and had developed partnerships with 3000 companies. Over 150 teachers-researchers are currently working at the UTT. This initiative, largely promoted from the local level by the department administration, is regarded by many as a success story (Galinier, 2019) and as a way to address the mismatch between skills supply and the labour demand, which was one of the main bottlenecks for the development of economic activity in Champagne-Ardenne.

In terms of accessibility, Champagne-Ardenne has benefitted from the decision to improve the connectivity of the region, with the opening of the high-speed rail station in Reims in 2007. This spurred local investments, notably in real estate around the new high-speed train-station located in Bezannes, as well as a reorganisation of economic activity around the new hub. However, the interviewees highlighted the displacement effect of this initiative, as it has been associated with the relocation of local businesses away from the centre of Reims and the region and closer to Paris. In addition, the number of trains from Reims to Paris remains quite limited, with prices that are high for the average consumer. Moreover, the high-speed rail link has done nothing to promote other, smaller cities in a region devoid of big economic centres. Overall, improving accessibility without addressing the structural challenges of region can result in drainage of local resources and further weakening of the economy.

From a governance viewpoint, one of the interviewees highlighted the success of Invest in Reims, an agency for the economic development of Reims created in 2003 by the Chamber of Commerce and Industry of Reims and Epernay, the town of Reims, and the inter-municipality of Reims. Over the years, this agency has managed to attract companies and to spur economic dynamism on the territory. More recently, the newly created Grand Est region also developed a regional innovation agency called "Grand e-nov". The chambers of commerce and industry are participating in this project, which aims to support local businesses with innovative ambitions.

The creation of the Grand Est region is in itself an initiative worthy of mention. In 2014 the French Parliament voted a territorial reform that resulted in the merger of the then existing 27 regions into just 14, effective from 2016. Champagne-Ardenne was merged with Lorraine and Alsace into the newly formed Grand Est region. The interviewees highlighted that this allowed to develop closer ties and better cooperation arrangements between departments. It also increased the potential for regional investments in local economic development projects, enhancing coordination and strategic allocation of available resources. One negative outcome of this merger, however, was the loss of public sector jobs associated with the dismantling of the former regional administration in Châlons-en-Champagne and a loss of visibility there is bound to affect the economy in the future. Finally, another prominent initiative

implemented very recently involved the creation of contracts between the State and local authorities. The 'Pacte Ardennes', as this contract is known, represents a collective strategy that aims at preparing the Ardennes for the future. Within this initiative, the Ardennes are a pilot territory for several national policies aimed at fostering local economic development (Conseil départemental des Ardennes, 2019).

Looking ahead, the interviewees highlighted three important avenues of possible policy intervention:

- One involved a continued focus on the promotion of higher education and research. The need to focus more and invest in higher education at the local level was emphasised during all interviews. It was broadly acknowledged that universities play a key role in regions such as Champagne-Ardenne. Some future policies were mentioned, notably the Campus 3000 project in Châlons-en-Champagne. This project aims at increasing the student population by 50 percent over the next decade. It also involves a review of the educational offer to increase alignment between higher education and the needs of local firms. A shortage of computer engineers has also been diagnosed on the territory and could be addressed by locally trained workers. Other initiatives mentioned during the interviews involved strengthening the cross-border ambition of the Charleville-Mézières university campus (which belongs to the university of Champagne-Ardenne), notably towards the neighbouring region of Wallonia in Belgium.

- Another initiative for future policy action that emerged from the interviews involved diversifying the local economy by promoting tourism in the region, leveraging its rural character and world-wide reputation in winemaking.

- Finally, on a more general note, one of the interviewees highlighted the need to reconsider the way territorial equalisation schemes work in France. Territorial equalisation schemes ('péréquation territorial', in French), respond to a Constitutional objective envisioned within Article 72-2 of the French Constitution to foster equality between local authorities. Some of the criteria for equalisation schemes rely on demographics, which results in more limited resources for depopulating regions, such as Champagne-Ardenne, to address the very problems that are driving demographic decline to begin with.

5.4 Jadranska Hrvatska (Adriatic Croatia), Croatia

Category: low-income region at high DT risk			
Economy		**Economic structure (% empl.)**	
GDP/capita (k EUR, 2005)	7.77	Agriculture	8.80
GDP/capita growth (y-o-y)	1.70	Industry	19.45
GVA/worker (k EUR, 2005)	18.51	Construction	8.24
GVA/worker growth (y-o-y)	2.18	Non fin. serv.	33.06
Empl./pop. ratio	0.36	Fin. and bus. serv.	6.89
Empl./pop. growth (y-o-y)	0.14	Non market serv.	23.56
Demographics		**Innovation and other**	
Population (thousands)	1388.34	Empl. in S&T (%)	12.74
Population growth (y-o-y)	0.19	GERD business	0.23
Median age	42.22	GERD government	0.12
Primary ed. (%)	19.96	Patents/million pop.	2.67
Secondary ed. (%)	61.24	EQI (mean 0, stdev 1)	-1.67
Tertiary ed. (%)	18.81	Urban pop. (%)	25.66

Note: All figures computed as averages over 1995/96-2015. Exceptions are education, S&T employment, and GERD (2001-2015), EQI (1995-2015), and urbanisation (2004-2015).

5.4.1 Introduction and Context

Adriatic Croatia was chosen as one of the case studies for three main reasons.

- First, the region displayed a steep increase in the development trap risk indicators throughout the period of study, despite some moderate improvements following 2010 (Figure 25).

- Second, Adriatic Croatia is a low-income region compared to the EU average, and belongs to a country that only joined the EU recently in 2013. It is thus of special interest to assess what kind of challenges it faces with respect to long term development trajectories, not only in light of its low-income status, but also as a region that has newly integrated into the Single Market (with the opportunities and challenges this entails).

- Third, despite its relative economic strength in Southeast Europe, Croatia displays some of the tell-tale signs of places that might be approaching a development trap `from below', as discussed in Section 2.2.1, such as a combination of positive amenities and low-cost of living and an extensive reliance on non-tradeable local service jobs with limited upgrading potential (e.g., in tourism). The challenges faced by this region also emerge in recent analysis of its overall competitiveness, as captured by the Regional Competitiveness Index (2019), where Adriatic Croatia ranked in the bottom 20 percent of all EU regions.

Adriatic Croatia is a highly heterogeneous region and one must consider the diversity of its socio-economic, geographic, and institutional characteristics to understand its development path and prospects. The local economy is also historically marked by the socialist foundations laid out during the Communist rule of Croatia as a federal republic in the former Yugoslavia, a country governed by centralised planning. Transition to a market-based system and economic restructuring began only after the first democratic multiparty elections took place in 1990. However, the Croatian War of Independence fought between 1991 and 1995 disrupted the incipient convergence process, costing thousands of lives and causing widespread economic and infrastructural damage. Remnants of the socialist economic and institutional foundations of Croatia have had a lasting effect on the overall performance of the country.

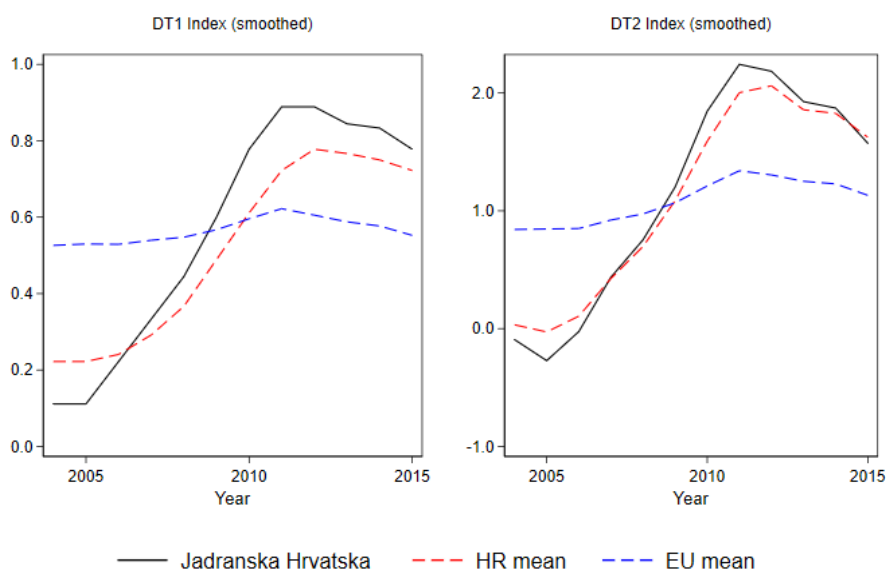**Figure 25: DT1 Index and DT2 Index (smoothed) in Adriatic Croatia**

Figure 26 gives a matrix that reports performance of all components of the DT Index separately for each year.[36] A glimpse at the Figure reveals that while the region did quite well before the 2008 crisis, it struggled to cope with the financial and economic consequences of this shock, decelerating sharply in terms of income, productivity, and employment growth, and performing relatively worse than Croatia overall or the EU. By contrast, since 2014 there have been some signs of improvement: the region's productivity growth has accelerated and employment per inhabitant has grown faster in relative terms than that of the rest of the country.

Figure 26: Accelerations/slowdowns and deviations from Croatia or the EU

All deviations are expressed in percentage points for ease of reading
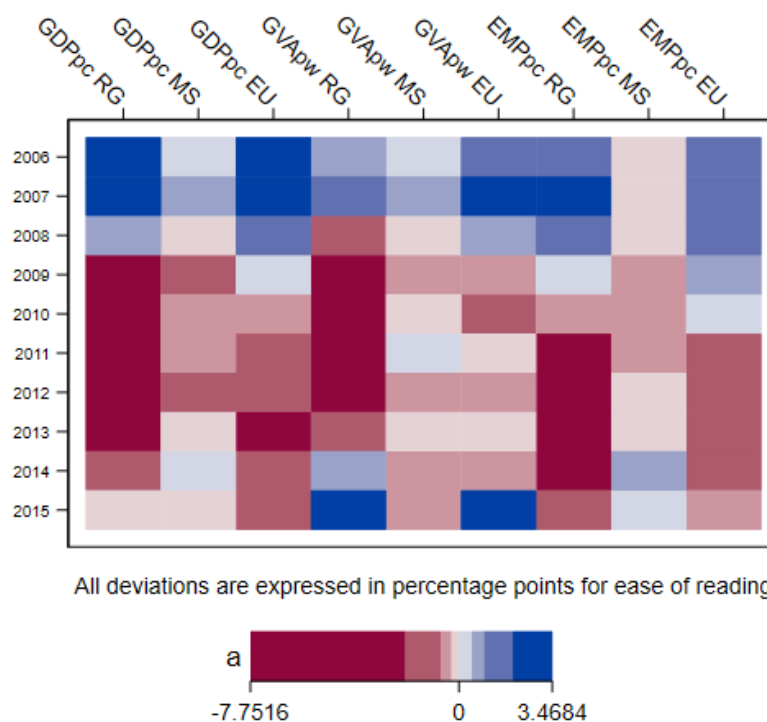
The case study confirms this intuition about the development trajectory of the region. Before 2008, Adriatic Croatia experienced economic growth spurred by large public sector expenditure and growing public and private sector debts. When the crisis hit, the local economy declined more sharply than in the rest of the country and the EU. Income per capita recorded a cumulative decline of 9.21 percent (and almost 20 percent in some of its counties), while the Republic of Croatia declined by 8.14 percent. In comparison, the EU's GDP dropped by 4.3 percent in the same period. The region entered a recession that lasted four years (2009-2013) but recovered two years faster than the rest of Croatia. The region's share of national GVA has remained relatively stable over time, but its economic structure has undergone important changes due to contraction of the manufacturing, construction, and ICT sectors after the crisis, accompanied by gains in wholesale and retail trade, transport and storage, accommodation, preparation and serving of food, and real estate business.

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[36] As in the previous case studies, the interpretation is as follows. Red (blue) cells denote poorer (better) performance compared to the benchmark. Colour shades reflect quartiles of deviation intensity, computed over the distribution of all deviations in the region across all years. The matrix can be read left to right to get a sense of how different components contributed to the overall index each year. Reading the matrix from top to bottom shows how the region performed on a specific index subcomponent over time. Figure 61 in Appendix is another way of visualising this information using multiple time-series graphs.

Overall, Figure 27 shows that the lion's share of the region's GVA is in services, a minor part of which is in non-market activities. However, in terms of employment, the financial and business sector is small, with most jobs being in non-financial and non-market services. Industry has shrunk, especially in terms of employment share. The large share of GVA and employment in services reflects the dominance of the hospitality and tourism industry in Adriatic Croatia. It is estimated that 19 out of 20 tourists travelling to Croatia select this region as a destination. Since 2015, due to high demand in the hospitality industry, the number of employed people increased in all counties. However, demand is mostly focused on specialised workers with relatively low levels of formal education. Moreover, demand has a significant seasonal and geographical dimension, with peaks in the summer season concentrated in the coastal part of the region.

Figure 27: Economic structure in Adriatic Croatia
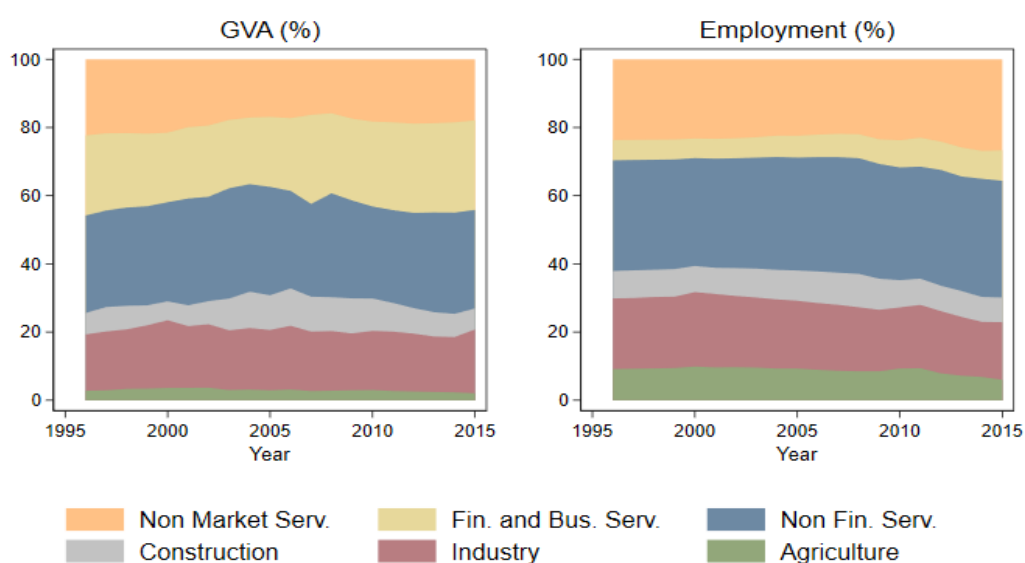
Productivity in the region is well below EU levels, and grew slowly since 1995, with a slight acceleration from 2014 onwards. Low productivity growth was driven by the tightening of credit conditions and policy uncertainty, which depressed investment, and a poor business environment, which impaired product market competition and limited the growth of more productive firms. Low regional competitiveness has meant that Adriatic Croatia has faced important challenges also in terms of volume and structure of its internationalisation process, including trade and FDI. Since the turn of the century, the share of the region's export in national volume decreased dramatically from 28.54 percent in 2002 to 27.67 percent in 2008 and 15.48 percent in 2018. This is a result of the persistent weak performance of the larger export-oriented firms (e.g. shipyards on the Adriatic coast), but also of the contraction in demand from the region's main trading partners (Italy and Slovenia, representing 27 and 13 percent of overall exports respectively). Accession to the Single Market in 2013 has allowed these activities to gain traction, but their overall significance in the region's economy is still minor. Similarly, the region has struggled to attract FDI, with strong spatial imbalances with respect to the rest of the economy. In the 1993-2017 period, Adriatic Croatia attracted less than a fifth of FDI than Zagreb, the capital city (5.3 vs. 26.9 thousand EUR per capita). Within the region, imbalances are also high, with most flows going to the county of Istria. In terms of composition, FDI concentrates in real estate activities and investments tend to be of brownfield nature in the period considered.

Employment levels are low compared to the rest of the EU, with only just over one every three inhabitants having a stable job. Dynamics are characterised by overall

decline, especially in the aftermath of the crisis, followed by a slight increase after accession to the EU. However, this effect was likely driven by significant outmigration following EU membership and the advantages of the Single Market. EU accession also contributed to brain drain, which was especially detrimental due to already low levels of tertiary education attainment (around 20 percent). Moreover, demographics show stagnant if not declining population levels, especially in rural and remote areas. This issue is exacerbated by rapidly growing house prices in coastal urban areas. Overall, this is reflected in a relatively old resident population with a high median age.

In terms of governance and local institutions, Croatia is organised as a two-tier system with 20 counties (županija) and 556 municipalities (općina) and cities (grad), representing local government units. The capital Zagreb holds a special status, being at the same time a city and a county. Although Croatia implemented several modifications to the NUTS 2 scheme over time, the administrative borders of Adriatic Croatia have not changed, comprising seven coastal counties (NUTS3 regions).[37] This set-up follows a process of progressive decentralisation of the institutional framework inherited from the socialist period. Counties are given the key role in this system, with supervisory and decreeing middle level competences. The transfer of many public responsibilities to local governments and counties, however, did not ultimately deliver fiscal decentralization and efficient coordination. Moreover, despite gradual improvements, Adriatic Croatia scores well below the EU average in terms of quality of government (as captured by the EQI index). Overlapping institutional remits combined with inefficient legal systems creates an environment of crony governance, fostering corruption and allowing politicans to win office and reward their cronies with personal favours and political protection. The resulting economic environement thus rewards political patronage and connections over merit and competence. These negative effects are exacerbated by the importance of tourism and real estate activites as a key source of income in the region.

5.4.2 Evidence and Perception of Development Traps

The evidence gathered on the field for this case study largely confirms the picture drawn using aggregate project data and the DT indices. According to the interviewees, performance in these measures accurately reflects the state of the regional economy and society, albeit with some qualifications.

One important finding is that even within Adriatic Croatia performance varies across counties and territorial areas. The county of Istria, for instance, has performed relatively better than other counties in the region. As a whole, northern counties, the seacoast, and urban areas have done relatively well. The rest of the region has, by contrast, lagged behind. Nevertheless, the predominant view is that Adriatic Croatia can indeed be considered trapped, as suggested by the DT measures. The interviewees also considered that the region is overall better off today than five years ago and, possibly, better off than Continental Croatia, the other NUTS2 region in the country – with the exception of Zagreb. However, they were uncertain whether the region can be regarded as having performed better than the rest of regions in the EU.

The interviewees emphasised that the region is still facing important challenges. In recent years, the industrial sector has shrunk further both in terms of GVA and employment. A telling example is the recent liquidation of the Uljanik shipbuilding company, a century old institution, source of employment and livelihood of many families, and a key player in the local economy. There are some examples of firms resilient to local conditions, showing employment and export growth (e.g., Infobip, a telecommunications company, and AD Plastik Group, specialising in the manufacturing of automotive components), particularly to Russian and Middle Eastern markets. The

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[37] These are: Primorje-Gorski Kotar, Lika-Senj, Zadar, Šibenik-Knin, Split-Dalmatia, Istria, and Dubrovnik-Neretva.

predominant view however was that many regional firms are in distress due to factors holding back labour productivity, such as administrative barriers, complex legal system, inadequate labour supply and skills shortage, aggravated by brain drain following EU accession. The interviewees also highlighted challenges linked to the large and growing hospitality industry. Strong reliance on this sector lowers aggregate worker productivity, while growing demand for this type of employment puts pressure on wages and spurs the hiring of foreign workers during the tourist season. In addition, construction and real estate developments catering to this demand (e.g., via investments in hotel buildings, private lodgings, villas and apartments) further reinforce the region's dependence on tourism.

With an eye to the future, the evidence collected from the case study suggests that the economic performance of Adriatic Croatia is unlikely to improve ten years from now unless policymakers address the deeply rooted structural problems of the local economy. While regional income growth has gained steam in recent years, there was a general lack of confidence regarding the ability of the economy to create jobs and to move along a sustainable long-term development path. Excessive reliance on tourism and tourism-related activities (such as local non-tradeable services, transport, and construction) was cited as the main reason for this. In particular, there were complaints that tourism was going down a low productivity route that enhanced the problems linked to its seasonal nature. Overall, despite the moderate rise in income experienced in recent years, the interviewees emphasised that the low labour productivity, the narrow economic structure, dependent on non-financial and non-market services, the low levels of tertiary educational attainment, the demographic decline, emigration and population ageing, are all factors keeping the region in a development trap and making it more sensitive to external shocks.

5.4.3 Factors Associated with Development Traps

Despite some regional peculiarities, the case study in Adriatic Croatia largely confirms the relevance of the aggregate findings with respect to drivers of development traps in EU regions. In particular, the role of the region's industrial structure, its low productivity, its demographic structure, and its flailing institutions are considered crucial in making it an economically trapped region. Its condition as a development trapped would appear to be a result of complex interactions between these mutually-reinforcing factors.

Adriatic Croatia displays an industrial structure largely reliant on non-financial and non-market services, particularly with respect to employment shares. This is mainly a result of the important role played by the hospitality sector in the local economy. Tourism can be a valuable source of revenues, but it requires careful management due to several associated challenges. The presence of natural amenities in the region, particularly around the coastlines, has been an important force driving this specialisation dynamic, allowing the tourism sector to grow as the region progressively opened to other markets. In addition, policymakers provided a fiscal stimulus to this sector in an attempt to mitigate the enormous loss of jobs experienced during the transition period after independence. More precisely, the tax system promoted investments towards the expansion of accommodation capacity. These measures however favoured the expansion of capacity in small private accommodation solutions (such as private room and apartment lets and small family-owned businesses) rather than larger structures and hotels. This is said to have had a negative aggregate impact on hospitality revenues due to the attraction of low-budget tourism flows. Strong growth of the hospitality sector combined with shrinking manufacturing and industrial output means that the region increasingly relies on tourist expenditure as the main source of income. It is estimated that Adriatic Croatia accounts for 95 percent of Croatian tourism turnover. This poses important challenges because of the low productivity that characterises this sector, its seasonal nature, and the exposure to foreign demand fluctuations due to unexpected shocks (such as the COVID-19

pandemic), changing preferences, and competition from other regions, both in the EU and elsewhere. Moreover, the predominance of tourism has pernicious effects that go well beyond the long-term. For sample, it discourages the pursuit of higher education by local youth, jeopardising the development of skills that will be needed to transform the economy in the future. It also affects the nature and quality of FDI flows, which target real estate and accommodation activities.

Another important factor associated with development traps is limited regional competitiveness, resulting largely from stagnant productivity. This has contributed to the erosion of the industrial base of the economy, further reinforcing specialisation trends in the hospitality sector. Low investment in education, few human resources devoted to science and technology, and limited investment in research and development – and innovation activities, more generally – are some of the key drivers of this outcome. Regional innovation output is thus small, and the region struggles to acquire and utilise knowledge developed elsewhere.

Interviewees also highlighted how the unfavourable demographic structure and ageing population, combined with outmigration and brain drain, is increasing the risk of falling into a development trap. The interviewees' perception also partly validated the hypothesis that retired individuals (with low pensions and savings) require private transfers and support from the younger generation, thus reducing their disposable incomes and subtracting resources from formal employment.

Finally, a key role is also played by soft factors such as formal and informal institutions and local government quality. These, to a large extent, result from the persistency of historical events in the region, notably Croatia's Communist rule. Since the early 1990s, Adriatic Croatia engaged in a process of transition from a planned socialist system to a market-based economy. The challenges of economic restructuring were further aggravated by the War of Independence fought between 1991 and 1995. Economic restructuring and the collapse of the Soviet Union meant that Croatia lost its access to export markets in former socialist countries. This led to high unemployment, large social welfare expenditure, and an uncertain economic environment. Against this backdrop, stability in key socio-economic indicators was largely regarded as the main objective, which spurred policies with short term, stabilising purposes, rather than long term development aims. These included the promotion of wholesale and retail trade, transport, storage, construction, and tourism activities (CCE, 2018, CBS, 2019). Construction, in particular, was heavily reliant on public expenditure, which combined with weak local institutions created fertile ground for crony capitalist behaviour and corruption, with long lasting implications (Vuković, 2017). An additional challenge specific to the Croatian historical context was the large outmigration resulting from free movement gained with the EU accession in 2013. This involved predominantly younger and better educated strata of the population in search of better opportunities elsewhere in the EU. These outflows produced a simultaneous deterioration of the human capital stock, further undermining efforts to promote a competitive environment for the economic and social development of Adriatic Croatia.

5.4.4 Policy Tools

Evidence collected for this case study suggests that past policies have been ineffective at promoting regional development in Adriatic Croatia. According to the interviewees, this can be ascribed to the complexity and lack of transparency of the interventions, along with inefficient delivery. It was emphasised that the weakness and fragmentation of local and regional public sector administrations contributed to raising costs and deteriorating the quality, effectiveness and sustainability of local services. Additionally, the interviewees recognised the importance of consistency, timeliness and synchronization of the implementation of various policies, programmes and instruments, and the need for cooperation among all participating agents, which was not the case in Adriatic Croatia during the 2000-2014 period. Key policy instruments were grants, tax reliefs, and direct investments into physical infrastructure, while

'soft', programme-based measures represented a negligible part of overall funding. However, because several different measures were implemented simultaneously with different laws, sources of funding, and responsible agencies, it is difficult to find credible evidence on the effectiveness of any single policy on regional development.

Only in 2009 did Croatia introduce a coherent package of regional interventions, with its 'Act on Regional Development'. This Act adopted the principles of Cohesion Policy into Croatia. The Act designated county agencies as regional coordinating bodies in charge of strategic planning process and project development. However, the interviewees perceived that despite their important role, the activities of the local development agencies were not target-oriented and lacked coordination and cooperation with other agencies and government levels, ultimately impairing the overall policy coherence. They also lamented the excessive influence by the central government on the use of regional budgets. More recently, the Ministry of Regional Development and EU funds introduced measures aimed at simplifying regional policy and improving transparency and accountability, which were seen positively by interviewees.

Going forward, representatives of the national authorities have become aware of the importance of defining strategic goals at the national level to deliver stronger convergence and cohesion at regional levels, by enhancing the coordination of all local activities (Maleković et al., 2018). The `National Development Strategy 2030' was produced to determine the development directions and strategic objectives of Croatia over the coming decade. This strategy should offer a foundation for efficient and effective cooperation among different national, regional and local bodies. Key priorities include higher investment in business and technological infrastructure, education, and information technology. The interviewed parties welcomed these initiatives, emphasising the need for policies aimed at supporting local government capacity and network-building among key regional actors (e.g., universities, private sector, and civil society institutions) to enhance cooperation. They also discussed the importance of further simplifications of the institutional framework, promotion of entrepreneurship and technology platforms, and initiatives aimed at upgrading hospitality services and infrastructures to facilitate the attraction of higher-end and more sustainable tourism.

5.5 Sydsverige (South Sweden), Sweden

| Category: high-income region at high DT risk			
Economy		**Economic structure (% empl.)**	
GDP/capita (k EUR, 2005)	27.83	Agriculture	3.61
GDP/capita growth (y-o-y)	1.26	Industry	16.80
GVA/worker (k EUR, 2005)	53.10	Construction	6.24
GVA/worker growth (y-o-y)	1.78	Non fin. serv.	23.88
Empl./pop. ratio	0.46	Fin. and bus. serv.	12.01
Empl./pop. growth (y-o-y)	-0.50	Non market serv.	37.47
Demographics		**Innovation and other**	
Population (thousands)	1314.44	Empl. in S&T (%)	24.77
Population growth (y-o-y)	0.71	GERD business	3.02
Median age	39.90	GERD government	0.09
Primary ed. (%)	19.58	Patents/million pop.	296.76
Secondary ed. (%)	47.52	EQI (mean 0, stdev 1)	1.37
Tertiary ed. (%)	32.89	Urban pop. (%)	30.73

Note: All figures computed as averages over 1990/91-2015. Exceptions are education, S&T employment, and GERD (1998/2001-2015), EQI (1995-2015), and urbanisation (2004-2015).

5.5.1 Introduction and Context

Our Development Trap indices also suggest that the region of South Sweden has experienced moderate or even high risks of being trapped at different point in time

during the period of study (Figure 28). Despite the volatility in the risk indicators, South Sweden has tended to show significantly larger changes in DT risk compared to the rest of Sweden, particularly in periods of economic crisis. In addition, South Sweden can be considered a relatively high-income region in the EU. High-income regions are, as seen in the econometric analysis, frequently likely to be trapped and write in certain cases, to experience relatively lengthy periods of economic decline. This makes the case of Sydsverige or South Sweden a very interesting case to examine in detail, as it represents an example of a type of region that has been in the past at the heart of economic development across many European countries but which, despite the less than stellar performance in recent years has fallen by the wayside in terms of policy attention. This case study aims to shed light on the local conditions that may be associated with development traps at high levels of income, thus adding qualitative evidence to quantitative findings from the regression analysis.

Figure 28: DT1 Index and DT2 Index (smoothed) in South Sweden
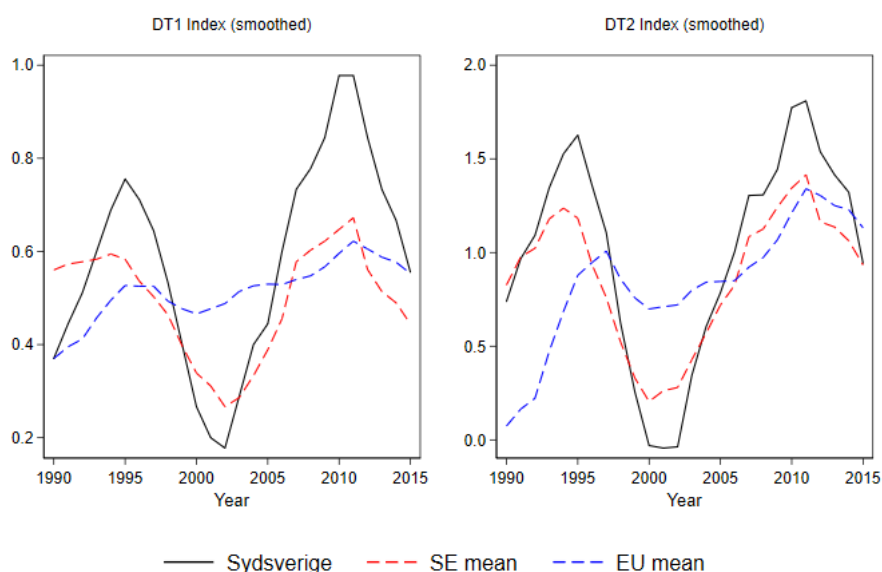
To better understand the factors driving changes in performance in the Index risk measures, as in the previous case studies the matrix in Figure 29 reports all components of the DT measures separately for each year.[38] Even a quick eyeballing of the matrix reveals that the region performed especially poorly with respect to the rest of Sweden and the EU in terms of growth in the employment to population ratio (particularly during the 1990s). It also experienced sharp decelerations in income per capita and productivity growth in the late 2000s.

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[38] See section 5.2.1 for the explanation on reading the matrix. Figure 62 in Appendix is another way of visualising this information using multiple time-series graphs.

Figure 29: Accelerations/slowdowns and deviations from Sweden or the EU

All deviations are expressed in percentage points for ease of reading
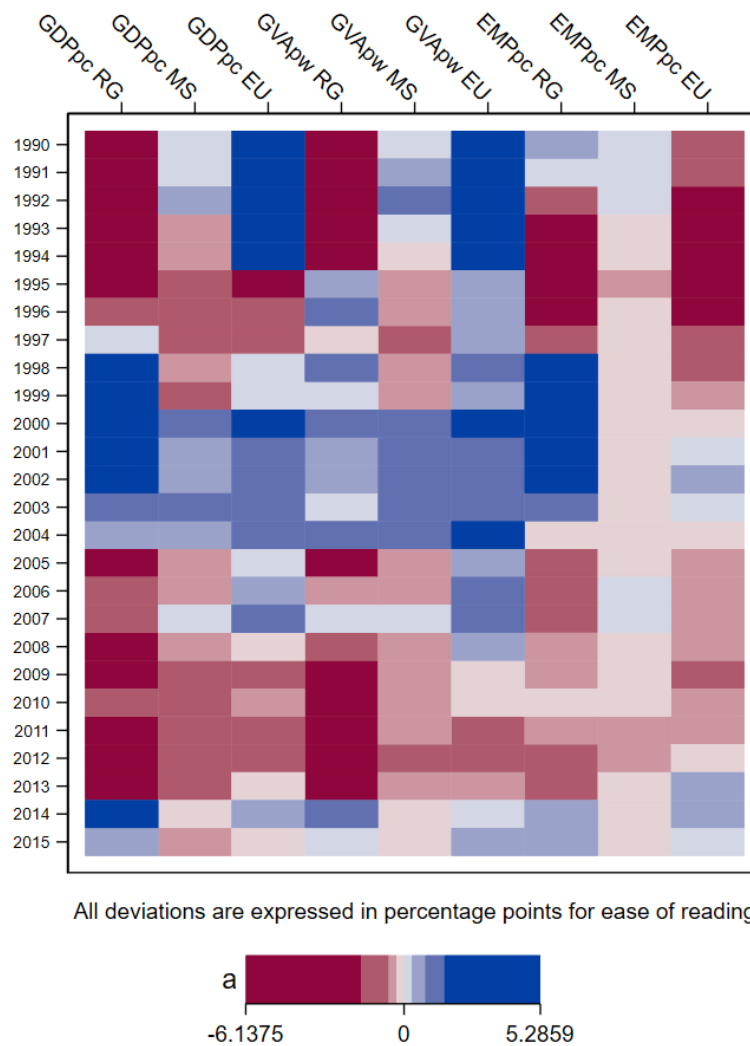
It is important to note that while the above graphs discuss development traps in South Sweden as a whole, the region is de-facto divided into two separate sub-regions, each with its own development trajectories and strategies. South Sweden (NUTS 2) consists of the two counties Skåne and Blekinge (NUTS 3). These counties share many similarities but also differences regarding population, number of municipalities, and industrial structure, among other characteristics. With a total population of 1,345 million, Skåne constitutes 11.3 percent of Sweden's economy. It is host to the country's third-largest city (Malmö) and is considered a physical gateway to continental Europe. The performance of Skåne is significant for Sweden's economy. Blekinge, on the other hand, is Sweden's smallest province on the mainland. The region consists of five municipalities with Karlskrona as the capital city. Blekinge has a total population of 159,371.

An overall trend affecting South Sweden is the concentration of production and economic activities in larger cities. This has resulted in a concentration of labour in the region's urban nodes that have experienced as a result higher employment rates and economic growth in comparison to rural areas. Employment is increasingly driven by the service- and knowledge-based industries in larger cities. Simultaneously we are witnessing a decline in labour-intensive manufacturing industry due to automation and an increasing demand for skilled labour. Another recent challenge for the southern region entails integrating the large inflows of foreign migrants.

Skåne has successfully moved up the value chain and shifted towards a knowledge-based economy, especially in professional and scientific services in areas such as ICT,

life sciences and cleantech. Nevertheless, Skåne has also lower labour productivity levels compared to the national average. Skåne is close to the OECD average in terms of gross domestic product per capita, but has the third-lowest GDP per capita of Sweden's 18 counties, and is losing ground on this measure, in relative terms, to the largest metropolitan area, Stockholm, according to OECD data. Blekinge is a region where the manufacturing industry constitutes a considerable larger share of both value-added and the number of persons employed. Even if there is a structural change towards more services, the region is more specialised in manufacturing compared to the rest of Sweden.

Figure 30 illustrates long term trends in the economic structure of South Sweden. Historically, South Sweden's economy relied on the farming and food, textile, and shipbuilding industries. In the 1950s and 1960s, shipbuilding in Malmö was one of the largest in the world. Except perhaps for food production, most of these sectors have progressively disappeared, with notable job losses. Until the 1980s, South Sweden was still characterized by a relatively low proportion of knowledge-intensive industry. This slowly began to change: the service sector has increased by about 10 percent since the 1980s and the manufacturing industry has decreased by the same share in terms of employment. The regional economic structure has gradually changed, and many new knowledge-intensive industries have strengthened, such as life science (particularly in Skåne, in Malmö and Lund) and ICT. The interviewees stressed, though, that Blekinge is somewhat lacking a future potential for local growth since their knowledge-intensive activities are still too small in terms of both size and number of companies and entrepreneurs. Across South Sweden, there is also continuous and considerable reliance on non-market service employment, most notably care workers. The majority of people working in this sector tend to have high education levels.

Figure 30: Economic structure in South Sweden
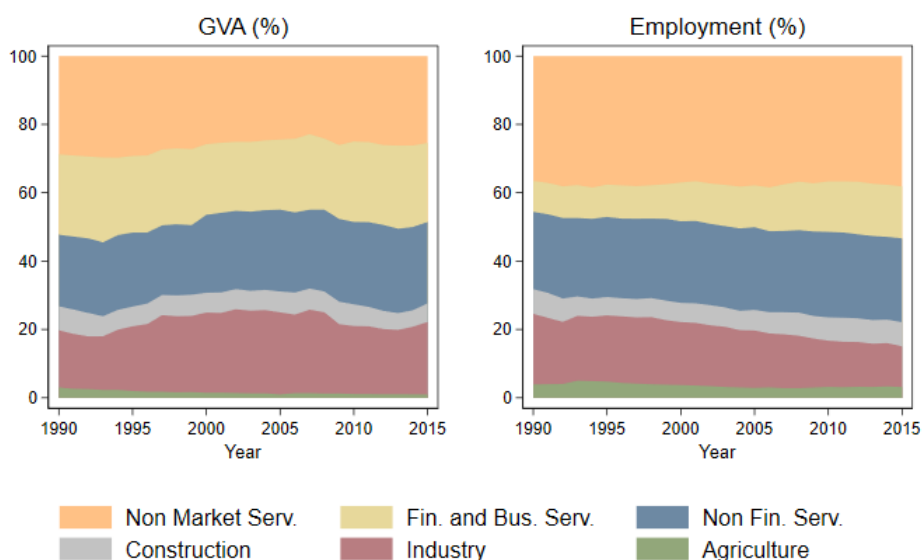
From an institutional and governance viewpoint, it is worth pointing out that Sweden is highly de-centralised. The country is divided into 21 counties and 290 municipalities, each enjoying high autonomy and power relative to the central state, as well as to other comparable public administrations. Some public authorities and government agencies also operate at regional and local levels. Healthcare, education, regional development and public transport, notably, are under the remit of counties via locally elected regional councils and county administrative boards. Overall, South Sweden scores high on the EQI index of government quality, just above the national level and far better than the rest of the EU.

5.5.2 Evidence and Perception of Development Traps

Locally gathered statistics and literature, as well as interview materials, draw a mixed picture with respect to whether South Sweden can be considered to be in or at risk of falling into a development trap. On one hand, several findings confirm the conclusions of our main statistical analysis conducted above as concerns the region being caught in a trap. These are:

- Productivity remains low in some geographical areas within the region;
- Urbanisation drives inter-regional inequality;
- Inadequate transportation results in small, disconnected labour markets;
- Mismatch in the supply and demand of competence/skills;
- Labour market participation is low among immigrants;
- Falling investments in R&D may become a problem in the future.

On the other hand, there is evidence confuting South Sweden being in a development trap, especially in consideration of its history of resilience and capacity of economic restructuring an upgrading. Other additional factors are:

- Some areas in the region show high productivity levels;
- Strong growth in innovative industries, particularly in Skåne;
- An advanced innovation system with good accessibility to venture capital;
- A high patent rate indicating a continuous potential for innovation.

Looking more in detail at the economic threats for the region, productivity levels in Skåne are significantly lower than in capital cities such as Stockholm and Copenhagen. Even though Skåne has transitioned successfully to a knowledge-based economy, some places within Skåne are still experiencing the impacts of restructuring in the manufacturing sector and its flow-on impacts such as low labour force participation. Furthermore, in Blekinge, it is mostly the high- and medium-tech sector, spearheaded by Ericsson and Volvo, which has accounted for the bulk of regional growth in productivity and value added. According to an interviewee, Blekinge's reliance on a few key large private companies (e.g. Volvo and Ericsson) pose a risk in terms of sensitivity of global market fluctuations. Moreover, transition from labour-intensive industries to an economy with more focus on services and knowledge-based industries has resulted in inter-regional inequality as larger cities are more prone to attract these types of economic activities and, as a result, skilled people and investments. This spatial concentration is evident in the north-eastern parts of Skåne, in Malmö and Kristianstad, and in Blekinge, in the capital city Karlskrona. Companies are attracted to locations with access to expertise and knowledge–networks and a presence of industrial clusters. In this context, the structure of the local transport system is an important factor for accessibility (of people, investment, etc.) between regional nodes. However, its inadequacy limits the movement of workers between local labour markets. This is the case in Blekinge, for instance, where only the municipalities of Ronneby and Torsås have good connections with the capital city, Karlskrona, with high demand for skilled employees. Long distance corridors also play a role. In the case of Skåne, for instance, a potential future challenge is the expansion of infrastructural connections towards Germany. The capacity of the current freight traffic system is inadequate to respond to the increasing exchanges with other European countries. Skill mismatch is another associated challenge. Fast population growth (accelerated by the recent large inflow of migrants) and structural change towards knowledge-intensive industries have revealed mismatches in the labour market. A growing demand has resulted in lasting shortages of labour in some occupations, foremost in high-skilled jobs. According to educational and labour market projections, there will be a considerable need of high-school level competencies in healthcare, and university graduates and high-skilled personnel in technology-intensive sectors. To manage this future demand, foreign-born citizens can offer a key contribution to the labour-market. However, failure in the labour market to integrate foreign citizens and new inflows of workers may result in increasingly negative, employment to population ratios.

Despite these challenges, the region has shown sustained growth in productivity, well above European rates, albeit not as high as the rest of Sweden. These gains mainly accrued thanks to the presence of strong industries, dominated by large firms such as Ericsson and Volvo. Skåne is also one of the most prominent regions in the country in terms of new business creation and the historical strength of this county in the food industry provided the basis for successful diversification into life sciences and high-value niche products, and also fruitful linkages with regional tourism. There are also world leading research institutes and one of the top universities in Sweden (Lund University) based in Skåne, with a long history of innovation, as well as acknowledged start-ups, which have attracted a considerable amount of venture capital to Skåne. Since the 1990s, innovation efforts have concentrated on ICT, life sciences and food and packaging industries, as also proxied by the strong performance in patents per million inhabitants. The region outperforms both Sweden and the EU on this metric. Lund – in part, thanks to the strength of its university – is the town in Sweden boasting most patents per capita over time, while Malmö ranks fifth for the same indicator. This outcome can be traced back to historically high rates of investment in research and development (up to nearly 5 percent of regional GDP), although GERD expenditure has decreased substantially since 2010, matching the Swedish mean in 2015, but remaining well above European averages. Finally, South Sweden high quality of government is confirmed by citizens' perceptions, acknowledging public sector quality and fairness of resource allocation.

5.5.3 Factors Associated with Development Traps

Overall, South Sweden shares, to some extent, characteristics that define development trapped regions. Costs are far too high in some industrial sectors to compete internationally in the long term. Over time, South Sweden's development process has been accentuated by processes of international outsourcing, offshoring, and by limited capacities either to attract inward investment or to support the internationalization of domestic firms. On the other hand, both Blekinge and Skåne have been taking measures supporting the transformation of the economy. In this context, South Sweden's level of skills and innovative capacity are strictly comparable to those of other EU high-income regions. At the same time, it is worth noting that some general structural changes are having ambiguous effects on the region's overall growth prospects. For example, whilst the productivity of local manufacturing firms in Blekinge is high, this is achieved by means of automation and digitalisation, leading to job losses. It is unclear whether workers who lost these jobs can be successfully reintegrated into related sectors (Edin, Evans, Graetz, Hernnäs, & Michaels, 2019).

Another interesting finding emerging from the interviews pertains to local culture and soft factors. Contrary to Skåne, Blekinge is perceived to be characterised by a persistent aversion to risk and entrepreneurship that hampers business initiative and weakens the creation of new jobs. This could partly be reconnected to its nature of old industrial region characterised by the presence of few large employers. Blekinge has lost a rather large share of industry jobs over time and, while productivity levels remain high, the average growth rate has been negative since the financial crisis in 2008.

Finally, South Sweden is exposed to the challenge – common to many EU regions – of rapidly ageing population and demographic decline, particularly outside the larger cities. Interviewees highlighted that in Blekinge the population has been relatively stable over the past decade thanks to the inflow of foreign migrants, which has counterbalanced an otherwise severe population decline.

5.5.4 Policy Tools

Historically, regional development policy in South Sweden – in alignment with national priorities and efforts – was structured around industrial policy, promotion of inter-

regional trade, integration of local labour markets, and skill-upgrading. After joining the EU in 1995, a number of initiatives were implemented aimed at fostering inter-regional cohesion, strengthening local clusters, as well as promoting innovation, smart specialisation, internationalisation and sustainable growth. Since 2006, several policies have been aimed at reducing labour costs for firms and stimulating hiring, although with limited effects. Sweden has also experienced a long-term process of shifting the responsibility for local economic development to the regional level, and that for regional transportation infrastructure planning from regional state agencies to directly elected county councils, with the explicit aim of strengthening the region as a driver for growth.

Both Skåne and Blekinge have a long tradition of supporting clusters. In Skåne, there are currently clusters in food, life science, IT, mobile media, environmental engineering, maritime sector, and packaging, among others. All the named seven clusters are extremely competitive from a global perspective and should be regarded as an important development tool.

Moreover, a number of projects financed by the European Structural and Investment Funds are in place, some of them joint between Skåne and Blekinge. One such example is South Sweden International – Regional Cooperation on International Business Promotion. The project's objective is to create a more globally connected business climate in South Sweden by facilitating export and trade opportunities for local small and medium (SMEs), as well as supporting foreign direct investment. The project is carried out by Invest in Skåne, Region Blekinge, and Almi Blekinge.

Regarding future policies aimed at reducing the risk of falling into the development trap, the interviews conducted together with findings in the literature have highlighted the following priorities:

- Policies addressing the increasing need for regional planning in South Sweden, such as strengthening regional strategy alignment and coordination.

- Many municipalities in South Sweden are facing major challenges due to demographic change and rapid urbanisation. Small municipalities face decline in population, isolation, and lack of competence. Measures supporting municipal mergers, in combination with investment in infrastructure, could help strengthen and widen, in the opinion of the interviewees, the local labour market, at the same time reinforcing inter-municipal cooperation and operational and strategic capacities.

- Investment in transport infrastructure is generally perceived to be crucial to sustain functional integration of local labour markets, particularly in Blekinge, where such infrastructure is lagging behind the national average.

- Although R&D capacity and the regional innovation system are strong in the region, the interviewees stressed the need for continuous investment in R&D. Access to finance aimed at facilitating the commercialisation of innovations and their diffusion across industries was discussed as one of the priorities. Emphasis was also placed on strengthening policy measures that support innovation-related public procurement.

- Strengthening the linkages between academia, research institutes, and SMEs was also highlighted by several interviewees as an important area for future policy in South Sweden.

- South Sweden can benefit more from the proximity to Denmark and particularly to the vibrant metropolitan area of Copenhagen. It is therefore crucial to continue the ongoing cross-regional collaboration efforts. The cross-border nature of the Öresund region remains a constraint for functional

integration. Differences in tax legislation, exchange rates, labour market and other regulatory regimes represent serious barriers to deeper integration across the Öresund. Policy measures aimed at removing current obstacles hindering the development and growth of the South Sweden-Copenhagen labour market should be considered.

- South Sweden – like Sweden itself and many other EU and OECD member countries – is facing increasing inequalities. A major issue related to such trend is the spatial segregation of low-income, and particularly migrant groups. According to the interviewees, future policy-making (both nationally, regionally and at the municipal level) must focus on tackling the lack of integration to ensure local economies can fully utilise regional resources.

5.6 Concluding Reflections on Case Studies

The qualitative evidence emerging from the case studies – summarised along the main dimensions in the synoptic Table 7 below – largely confirms the aggregate quantitative picture described using regression analysis. Industrial structure, productivity, human capital, and institutions are key factors to take into consideration when discussing long term development trajectories of places.

The case studies, however, provided additional nuance and richness in the complexity and diversity of combinations through which economic stasis and falling into traps manifest themselves in different regions of Europe. One important finding is that long term development is the outcome of the complex interplay between these and other place-specific factors, none of which can be fully understood in isolation. Investment in R&D, for instance, is not and cannot be a one-size-fits-all solution for all regions. It may be ineffective in many local contexts in the absence of key preconditions (especially at low income levels). Similarly, education, while always desirable in any development strategy, cannot be the only solution to tackle development traps. Special attention should be paid to aligning interventions in the supply of skills to the potential demands in the labour market (e.g., via vocational and technical training) and to improving local institutional quality. Moreover, the fieldwork revealed that there is high local variation in economic performance even *within* the same region, highlighting the vast heterogeneity characterising European regions.

Finally, the case studies also offered an opportunity to study the role of trade, FDI, and international integration, highlighting the importance of these factors for long term development. In what follows, we reflect more carefully on the policy learning and recommendations that can be drawn from the analysis in this report.

Table 7: Synoptic table on the case studies

REGIONS DIMENSIONS	ABRUZZO (IT) (middle-income region)	CHAMPAGNE-ARDENNE (FR) (middle-income region)	ADRIATIC CROATIA (HR) (low-income region)	SOUTH SWEDEN (SE) (high-income region)
DT trajectory	Fell in DT between mid-1990s and late 2000s (lost Obj. 1 status and national funds in mid-90s), eased later due to better (than national) economic performance because of strong industrial structure and public investments for reconstruction after 2009 earthquake; sovereign debt crisis in 2012 hit hard; GDPpc from 111 (EU = 100) in 1992 to 77 in 2017	Once prosperous industrial region, suffered from deindustrialization and automatization; approaching a DT 'from above' at least since mid-1990s; persistent stagnation in income and jobs, decline in GDPpc since 2000s; 2008 crisis highlighted limited economic resilience; "formerly well-off, moved into prolonged periods of relative economic decline"	Transition to market-based economy from 1990 but disrupted by War of Independence (1991-1995); hit harder than the country by the 2008 crisis; steep increase in DT risk throughout the period, despite some moderate improvements after 2010 (joined EU in 2013); exemplar of DT risk `from below'; ranked in bottom 20% of all EU regions in RCI 2019	Moderate to high risk of DT at different point in time throughout the period; significantly larger volatility in DT risk compared to the rest of country, particularly during economic crisis
Structural features of regional system	Strong manufacturing industry, increasing (1970-2018) both in VA and employment; large presence of foreign MNEs; high capital deepening and availability and quality of human capital; weak development of advanced tertiary sector; very weak urbanisation; low expenditure in private R&D; insufficiently developed innovation networks; lack of efficiency of government and local administrations; ageing population, and increasing depopulation	Strong specialisation in agriculture and agri-food, winemaking fundamental; biorefinery and metallurgy other core industries; clusters in bioeconomy, metalwork, and renewable energy; strategically located near European core; feeble tertiary sector; limited ability to innovate, low R&D; educational attainment, especially tertiary, lower than national average; low quality of government; demographic decline; limited access to medical services by residents	Highly heterogeneous; biggest GVA share in non-financial and non-market services, dominance of hospitality and tourism; shrinking manufacturing employment; dramatic fall of export share in 2002-2018; EU entry helped, but low FDI inflow (mostly in real estate); brain drain plus very low tertiary education; stagnant population; great natural amenities; growing house prices in coastal areas; well below EU average for government quality although improving	2 sub-regions: Skåne, specialised in services in ICT, life sciences and cleantech, and Blekinge, specialised in manufacturing; Skåne far more economically significant but below national average for productivity and GDPpc growth; concentration of economic activities in larger cities; employment driven by services and knowledge-intensive industries; large inflows of foreign migrants; rapidly ageing population; high government quality, above national and EU28
NEGATIVE perceptions (support DT)	Majority agree on DT; earthquake reconstruction as a 'missed opportunity'; externally-controlled firms failed to develop local networks of suppliers; weakened FDI; feeble internationalisation and integration in GVCs by SMEs; inadequacy of railway and airport infrastructure; weakness of KIBS; economic structure not enough innovative; relatively low demand for skilled workers, skill-mismatch; poor quality of	Large support to DT (or risk of), albeit with some sub-regional variation; structural demographic decline as foremost DT indicator, youth outmigration and rapid ageing; closure or merging of local firms (even historical large); sustained job loss in core industries; tertiary employment growth due to public sector and temporary contracts; skill mismatch; absence of large urban areas, dependence from the	Predominant consensus on high DT risk; performance varies strongly within region; recent liquidation of historical shipbuilding company; many factors holding back productivity (e.g. administrative barriers, complex legal system, inadequate labour supply and skills shortage, brain drain after EU accession); dependence on large and growing tourism industry reinforced by construction and real estate	Agreement on some DT features; productivity in Skåne significantly lower than in Stockholm, despite transition to knowledge economy; danger in Blekinge's reliance on a few key large private companies, and persistent aversion to risk and entrepreneurship; rising inter-regional inequality driven by urbanisation; inadequate local transport system; predicted shortage of high-school level competencies in healthcare, and

	technical and vocational training; inadequacy and ineffectiveness of local ruling class; misalignment in policy directions and objectives across legislatures	capital; historical perception that prosperity will come back leading to a certain inertia	developments, with connected challenges (e.g. low knowledge-intensity and productivity, high seasonality)	university level in technology-intensive sectors; failure in integrating foreign workers in local labour markets
POSITIVE perceptions (confute DT)	Some see beginning of a recovery phase, more than DT; indisputable strength of manufacturing, wide sectoral diversification; examples of industrial excellence (e.g. automotive and mechatronics, ICT-aerospace, pharmaceutical life sciences, agri-food); very important and innovative large firms and foreign MNEs, well connected with local universities; still partially unexploited unique natural and artistic heritage assets	Positive perceptions of surviving industrial companies managing to modernise and automate production, increasing plant productivity and preserving competitiveness; openness to international trade, with overall positive trade balance (especially production of Champagne); high investments comparable to France, and much higher than EU average; high business creation since 2015	More positive perceptions of Istria, northern counties, seacoast, and urban areas, doing relatively well; overall, region better off today than 5 years ago; examples of resilient firms showing employment and export growth; potential to facilitate upgrading to higher-end and more sustainable tourism	Visible sustained growth in productivity in some areas, linked to the presence of few large companies; in Skåne: successful diversification into life sciences and high-value niche products, world leading research institutes and some top universities, new business creation and VC attraction; overall, skills and innovative capacity strictly comparable to EU high-income regions; high public sector quality
Main forces behind DT	Lack of innovative capacity and, more generally, of a functioning innovation system; dearth of linkages and networks between MNEs, large and small firms limiting spillovers and collective learning processes; weak active internationalisation and KIBS	Long-term decline in manufacturing with employment loss and associated decline in population; narrow specialisation of industry structure; inadequate educational attainments, especially tertiary education; local reliance on non-market services	Excessive reliance on non-tradeable service jobs with limited upgrading potential (e.g. tourism); brain drain; low quality FDI in real estate/accommodation; very small investment in education and innovation; low quality of institutions and local government inherited by communist rule	Very high costs driving intense international outsourcing, offshoring, limited attractiveness to FDI; limited support to internationalization of local firms; automation/digitalisation leading to job losses; high heterogeneity in productivity and specialisation between larger cities and the rest
Examples of current policies	RIS3 entrepreneurial discovery involving local production systems and representatives of MNEs established in 5 domains of specialisation: Automotive / Mechatronics, Life Sciences, ICT / Space, Agrifood/ and Fashion / Design, broadly corresponding to strongest pillars of local industrial structure. Long-term vision: making Abruzzo the "region of sustainable industry"	Initiatives (e.g. Campus 3000 project) to strengthen success of UTT universities' network with TH missions (research, training and technology transfer); creation of the Grand Est region (with RDA) for increasing potential investment, innovation, and territorial coordination; establishment of contracts between State and local authorities, i.e. 'Pacte Ardennes'	'Act on Regional Development' 2009 adopts principles of Cohesion Policy; Ministry of Regional Development and EU funds to improve transparency and accountability; `National Development Strategy 2030' to advance governance, plus key priorities investment in business and technological infrastructure, education, ICT, and upgrading of hospitality services	Various projects financed by EU Structural and Investment Funds currently in place, some jointly between Skåne and Blekinge, e.g. South Sweden International – Regional Cooperation on International Business Promotion, aimed at creating a more globally connected business climate by facilitating export and trade opportunities for local SMEs, and supporting inward FDI

6 POLICY RECOMMENDATIONS

Policy recommendations are here developed according to the following general principle: we consider to what extent the qualitative findings from case studies reflect the story developed through the quantitative analysis. Most of the findings of the two methodologies applied in this report are in fact aligned, demonstrating the relevance of the mixed-method approach for the design and implementation of place sensitive policies. In all instances, we recommend using caution in interpreting findings. Results should not be overstated as there are limitations to this analysis, which, due to its innovative nature, remains explorative and experimental in scope. The overall picture developed in the analysis also remains at this stage descriptive rather than causal. Based on the econometric analysis and qualitative case studies, some lessons which can serve as a base for policy recommendations emerge. These include the following points:

- *Regional dynamics as a base for policy thinking*. So far regional policy, in the EU as elsewhere, has mainly focussed on levels rather than change. It has mainly focused on either less developed regions and countries or on those areas considered capable of providing the greatest opportunity, which often coincide with more developed regions. In line with evolutionary economic geography views (e.g., Boschma, 2004; Boschma & Frenken, 2006; Hassink, 2010; Iammarino, 2005; Martin & Sunley, 2006), it is vital to incorporate the dynamics of regionally embedded economic, institutional, and social structures when trying to provide more adequate answers to the challenges associated with mobilising the full economic potential of regions. Targeting not just the least and most developed regions, but also those that fall into a development trap – regardless of their starting point or level of development – would help address better than hitherto a series of critical questions regarding changes in long-term development trajectories, moving away from social, economic and institutional path dependency, or triggering structural change. By overlooking regional dynamics, policy risks itself to incur in a trap, neglecting both potential and limitations of the development capacity of heterogeneous regions with highly differentiated trajectories.

- *Development traps can occur at all income levels*. As argued in this report, being trapped can take place at many different levels of income, and its perception by the people goes well beyond the ranking of their region in terms of wealth. This finds support also in recent academic work on rising popular discontent in the EU (Dijkstra, Poelman, & Rodríguez-Pose, 2019; McCann, 2020). This reinforces the view that regional development intervention needs to come in different forms and guises in order to better cope with a phenomenon that is multifaceted by nature.

- *Policy differentiation is tricky but inevitable*. The patterns of development traps do not respond to a simple core-periphery geography, but rather one of structurally different 'clubs' of regional economies. Focusing on the economic dynamics of territories renders the dichotomy between core and periphery in the EU obsolete, especially since the outbreak of the 2008 crisis and subsequent recession. Escaping both the generalisation of the core-periphery model and the uniqueness of regional cases is the big challenge for future development policy, as also shown by the complexity of applying the traditional middle-income trap concept to the EU regions. Place-sensitive distributed development policies (PSDDP) respond precisely to this logic: maximizing distributed development capabilities of each territory, creating greater opportunities for its population, at the same time referring to a logic of

different types of places (Iammarino et al., 2017, 2019). The nature and type of intervention needs to vary depending on the severity, length, direction of the development trap, considering the levels of wealth of the region, and its wider institutional setting.

- *Policy coordination and integration need attention*. The coordination of mission oriented, top-down, technology-led approaches, and diffusion-oriented, bottom-up, capacity-building programmes, requires fine tuning, as they strongly depend on institutional contexts and regional governance. Conflict among policy objectives and misalignment of policy-makers' actions can neutralise the effectiveness of measures adopted to re-direct development trajectories. As confirmed by our case studies, regions with weaker institutional conditions may need more top-down governance, while at the same time requiring more involvement of local actors for institutional capacity building at the local level; innovation policy interventions aimed at sustaining R&D expenditure in the business sector may forget that between the adoption of technologies developed elsewhere and being on the technological frontier there are intermediate steps of improving incrementally what already exists in the region. Similarly, taking on board both synergies and incongruities with other areas of intervention is becoming increasingly crucial. Support to investment in regional R&D may not be effective without a complementary role played by capabilities and skills locally available, as well as extended tertiary education without the presence of advanced technical and vocational profiles aligned with enterprises' demand may lead to brain drain.

- *Extension of data and measurements of the development trap*. Additional detail must be added for specific variables that have gained huge relevance over time but are still largely missing from EU-level policy strategy. For instance, as emerged from the case studies, education is not just about quantity but also about quality – and unfortunately data on this is lacking (i.e. generally absent, not harmonised, no long-term series). Furthermore, as indicated clearly by all case studies here reported and particularly by that of the Abruzzo region, quantitative analysis at the subnational level do not currently allow to take into account a fundamental dimension of modern economies: internationalisation and integration in the global economy. Comparable indicators of trade, inward and outward FDI, participation in GPNs and GVCs, and international migration flows, are still not available for the EU regions. The same can be said of measures of intangible assets. This is a serious limitation, also to the present report, as such processes are behind most structural transformations in open knowledge-based economies: overlooking such dimensions inevitably generates distortions and omissions in tackling regional development traps.

7 CONCLUSIONS

In conclusion, the evidence outlined in this report provides a definition of what is a middle-income trap at a regional level in Europe and proposes different dynamic measures of regions at risk of falling into such traps, based on the economic performance of the region relative to itself, to other regions in the country where it is located, and to other regions in the EU. This allows the mapping of regions at the greatest risk of being in or falling into a trap, presenting what is the first detailed picture of the development of traps across the EU at a regional level. The report also raises the concern that confining the definition of regional traps to middle-income levels conceals the heterogeneous and multi-faceted nature of this concept, which applies to regions with very different past development trajectories. Accordingly, we

have opted for a more agnostic re-labelling of this concept to `development traps' (DTs).

This report has also documented a series of stylised facts about regions in development traps at different levels of income, validating these in a multivariate setting by means of regression analysis. First, we document that regions in DTs grow slower than non-trapped paces, even compared to peers within the same income category. This suggests that our proposed metric does not simply capture regional convergence dynamics. We also find that, relative to their category peers, DT regions tend to display lower growth in employment and employment to population ratios, especially at low-income levels. Their industry shares in the total economy's GVA are also lower, as are human capital levels (proxied by attainment of secondary education by working-age population). In low-income regions, the median resident is older in trapped places relative to more dynamic regions.

Our regression analysis largely confirms this picture. Development traps occur more frequently in relatively richer and larger places, with smaller shares of industry in the economy. DT regions also often display greater reliance on non-market services, validating previous findings about sheltered economies. In regions in or at risk of a DT, dependency ratios are higher, and local government quality is worse. There is also suggestive evidence of spatial skill mismatches in these places, whereby higher human capital alone is not associated with lower risk in low-income regions but supports economic dynamism in economically better-off places. The presence of science and technology jobs also matters to prevent poorer places from falling into a trap. Looking at factors that help regions claw their way out of traps, we find that increasing industrial GVA and reducing dependence on non-market services lowers DT risk. Greater industry productivity can help poorer regions, while government spending on R&D mainly benefits high-income places. We also confirm that human capital accumulation pays off in wealthier economies, whereas the poorest regions in the EU can benefit from growth in S&T jobs. Improvements in institutional quality greatly benefit high-income regions but can disrupt the poorest places in the EU.

Finally, our mixed method approach – validating with in-depth case studies the results obtained by the quantitative analysis – has allowed to have a more nuanced picture of the challenges ahead of European regional development policies. Establishing a learning exchange with, among others, science, technology and innovation policy, education and social policy, environmental policies, transport and competition policies will lead to better, more integrated and balanced development policies, and can prove crucial for the future effectiveness of the efforts to maximise the economic potential of all places in the EU, while at the same time combating more effectively regional inequalities.

REFERENCES

Main Report

Abramovitz, M. (1986). Catching Up, Forging Ahead, and Falling Behind. *The Journal of Economic History*, *46*(02), 385–406. https://doi.org/10.1017/S0022050700046209

Acemoglu, D., Aghion, P., & Zilibotti, F. (2006). Distance to Frontier, Selection, and Economic Growth. *Journal of the European Economic Association*, *4*(1), 37–74. https://doi.org/10.1162/jeea.2006.4.1.37

Acemoglu, D., Cantoni, D., Johnson, S., & Robinson, J. A. (2011). The Consequences of Radical Reform: The French Revolution. *American Economic Review*, *101*(7), 3286–3307. https://doi.org/10.1257/aer.101.7.3286

Agasisti, T., & Cordero-Ferrera, J. M. (2013). Educational disparities across regions: A multilevel analysis for Italy and Spain. *Journal of Policy Modeling*, *35*(6), 1079–1102. https://doi.org/10.1016/j.jpolmod.2013.07.002

Agénor, P.-R. (2017). CAUGHT IN THE MIDDLE? THE ECONOMICS OF MIDDLE-INCOME TRAPS. *Journal of Economic Surveys*, *31*(3), 771–791. https://doi.org/10.1111/joes.12175

Agénor, P.-R., & Canuto, O. (2015). Middle-income growth traps. *Research in Economics*, *69*(4), 641–660. https://doi.org/10.1016/J.RIE.2015.04.003

Agénor, P.-R., & Canuto, O. (2017). Access to finance, product innovation and middle-income traps. *Research in Economics*, *71*(2), 337–355. https://doi.org/10.1016/J.RIE.2017.03.004

Aghion, P., Howitt, P., & Mayer-Foulkes, D. (2005). The Effect of Financial Development on Convergence: Theory and Evidence. *The Quarterly Journal of Economics*, *120*(1), 173–222. https://doi.org/10.1162/0033553053327515

Aghion, Philippe, & Bircan, C. (2017). The Middle-Income Trap from a Schumpeterian Perspective. In *EBRD Working Paper No. 205* (No. 205). https://doi.org/10.2139/ssrn.3119146

Aiello, F., & Scoppa, V. (2000). UNEVEN REGIONAL DEVELOPMENT IN ITALY: EXPLAINING DIFFERENCES IN PRODUCTIVITY LEVELS. *Giornale Degli Economisti e Annali Di Economia*, *60 (Anno 1*(2), 270–298. Retrieved from http://www.jstor.org/stable/41954956

Aiyar, S., Duval, R. A., Longmei, Z., Puy, D., & Wu, Y. (2013). *Growth Slowdowns and the Middle-Income Trap* (No. WP/13/71). Washington, DC: International Monetary Fund.

Amin, A. (1999). An Institutionalist Perspective on Regional Economic Development. *International Journal of Urban and Regional Research*, *23*(2), 365–378. https://doi.org/10.1111/1468-2427.00201

Antonelli, C., Patrucco, P. P., & Quatraro, F. (2011). Productivity Growth and Pecuniary Knowledge Externalities: An Empirical Analysis of Agglomeration Economies in European Regions. *Economic Geography*, *87*(1), 23–50. https://doi.org/10.1111/j.1944-8287.2010.01104.x

Athukorala, P.-C., & Woo, W. T. (2011). Malaysia in the middle-income trap. *Asian Economic Panel Meeting at Columbia University, New York*, 24–25.

Autor, D. H., & Dorn, D. (2013). The growth of low-skill service jobs and the polarization of the US Labor Market. *American Economic Review*. https://doi.org/10.1257/aer.103.5.1553

Azariadis, C., & Stachurski, J. (2005). Poverty Traps. In Philippe Aghion & S. N. Durlauf (Eds.), *Handbook of Economic Growth* (Vol. 1, pp. 295–384). https://doi.org/10.1016/S1574-0684(05)01005-1

Barrett, C. B., & Swallow, B. M. (2006). Fractal poverty traps. *World Development*, *34*(1), 1–15. https://doi.org/10.1016/J.WORLDDEV.2005.06.008

Barro, R. J. (1992). Convergence. *Journal of Political Economy*, *100*(2), 223–251. https://doi.org/10.1086/261816

Barro, R. J., & Sala-i-Martin, X. (1992). Convergence. *Journal of Political Economy*, *100*(2), 223–251. https://doi.org/10.1086/261816

Barro, R. J., Sala-i-Martin, X., Blanchard, O. J., & Hall, R. E. (1991). Convergence Across States and Regions. *Brookings Papers on Economic Activity*, *1991*(1), 107. https://doi.org/10.2307/2534639

Barro, R. J., Sala-I-Martin, X., Blanchard, O. J., & Hall, R. E. (1991). Convergence Across States and Regions. *Brookings Papers on Economic Activity*, *1991*(1), 107–182. https://doi.org/10.2307/2534639

Becker, S. O., Boeckh, K., Hainz, C., & Woessmann, L. (2016). The Empire is Dead, Long Live the Empire! Long-Run Persistence of Trust and Corruption in the Bureaucracy. *The Economic Journal*, *126*(590), 40–74. https://doi.org/10.1111/ecoj.12220

Ben-David, D., & Papell, D. H. (1998). Slowdowns and Meltdowns: Postwar Growth Evidence From 74 Countries. *Review of Economics and Statistics*, *80*(4), 561–571. https://doi.org/10.1162/003465398557834

Benhabib, J., Perla, J., & Tonetti, C. (2014). Catch-up and fall-back through innovation and imitation. *Journal of Economic Growth*, *19*(1), 1–35. https://doi.org/10.1007/s10887-013-9095-z

Bernard, A. B., & Durlauf, S. N. (1995). Convergence in international output. *Journal of Applied Econometrics*, *10*(2), 97–108. https://doi.org/10.1002/jae.3950100202

Bernard, A. B., & Durlauf, S. N. (1996). Interpreting tests of the convergence hypothesis. *Journal of Econometrics*, *71*(1–2), 161–173. https://doi.org/10.1016/0304-4076(94)01699-2

Beugelsdijk, S., & Van Schaik, T. (2005). Differences in social capital between 54 Western European regions. *Regional Studies*, *39*(8), 1053–1064. https://doi.org/10.1080/00343400500328040

Blanchard, O. J., Katz, L. F., Hall, R. E., & Eichengreen, B. (1992). Regional Evolutions. *Brookings Papers on Economic Activity*, *1992*(1), 1–75. https://doi.org/10.2307/2534556

Boeri, T., Ichino, A., Moretti, E., & Posch, J. (2019). Wage Equalization and Regional Misallocation: Evidence from Italian and German Provinces. *National Bureau of Economic Research Working Paper Series*, *No. 25612*. https://doi.org/10.3386/w25612

Boldrin, M., & Canova, F. (2001). Inequality and convergence in Europe's regions: reconsidering European regional policies. *Economic Policy*, *16*(32), 206–253. Retrieved from http://dx.doi.org/10.1111/1468-0327.00074

Boschma, R. (2004). Competitiveness of regions from an evolutionary perspective. *Regional Studies*, *38*(9), 1001–1014. https://doi.org/10.1080/0034340042000292601

Boschma, R. (2015). Towards an Evolutionary Perspective on Regional Resilience. *Regional Studies*, *49*(5), 733–751.

https://doi.org/10.1080/00343404.2014.959481

Boschma, R., & Frenken, K. (2006). Why is economic geography not an evolutionary science? Towards an evolutionary economic geography. *Journal of Economic Geography*, *6*(3), 273–302. https://doi.org/10.1093/jeg/lbi022

Boschma, R., & Frenken, K. (2009). Some Notes on Institutions in Evolutionary Economic Geography. *Economic Geography*, *85*(2), 151–158. https://doi.org/10.1111/j.1944-8287.2009.01018.x

Boschma, R., & Iammarino, S. (2009). Related Variety, Trade Linkages, and Regional Growth in Italy. *Economic Geography*, *85*(3), 289–311. https://doi.org/10.1111/j.1944-8287.2009.01034.x

Boschma, R., Minondo, A., & Navarro, M. (2013). The Emergence of New Industries at the Regional Level in Spain: A Proximity Approach Based on Product Relatedness. *Economic Geography*, *89*(1), 29–51. https://doi.org/10.1111/j.1944-8287.2012.01170.x

Breinlich, H., Ottaviano, G. I. P., & Temple, J. R. W. (2014). Regional Growth and Regional Decline. *Handbook of Economic Growth*, *2*, 683–779. https://doi.org/10.1016/B978-0-444-53540-5.00004-5

Cai, F. (2012). Is There a "Middle-income Trap"? Theories, Experiences and Relevance to China. *China & World Economy*, *20*(1), 49–61. https://doi.org/10.1111/j.1749-124X.2012.01272.x

Canova, F. (2004). Testing for Convergence Clubs in Income Per Capita: A Predictive Density Approach. *International Economic Review*, *45*(1), 49–77. https://doi.org/10.1111/j.1468-2354.2004.00117.x

Carlino, G. A., & Mills, L. O. (1993). Are U.S. regional incomes converging?: A time series analysis. *Journal of Monetary Economics*, *32*(2), 335–346. https://doi.org/10.1016/0304-3932(93)90009-5

Castellani, D., & Pieri, F. (2013). R&D offshoring and the productivity growth of European regions. *Research Policy*, *42*(9), 1581–1594. https://doi.org/10.1016/J.RESPOL.2013.05.009

Castelló-Climent, A., & Hidalgo-Cabrillana, A. (2012). The role of educational quality and quantity in the process of economic development. *Economics of Education Review*, *31*(4), 391–409. https://doi.org/10.1016/j.econedurev.2011.11.004

Charron, N., Dijkstra, L., & Lapuente, V. (2014). Regional Governance Matters: Quality of Government within European Union Member States. *Regional Studies*, *48*(1), 68–90. https://doi.org/10.1080/00343404.2013.770141

Combes, P.-P., Duranton, G., & Gobillon, L. (2008). Spatial wage disparities: Sorting matters! *Journal of Urban Economics*, *63*(2), 723–742. https://doi.org/10.1016/j.jue.2007.04.004

Crescenzi, R., Di Cataldo, M., & Rodríguez-Pose, A. (2016). GOVERNMENT QUALITY AND THE ECONOMIC RETURNS OF TRANSPORT INFRASTRUCTURE INVESTMENT IN EUROPEAN REGIONS. *Journal of Regional Science*, *56*(4), 555–582. https://doi.org/10.1111/jors.12264

Crescenzi, R., Gagliardi, L., & Percoco, M. (2013). Social capital and the innovative performance of Italian provinces. *Environment and Planning A*, *45*(4), 908–929. https://doi.org/10.1068/a45221

Crescenzi, R., & Iammarino, S. (2017). Global investments and regional development trajectories: the missing links. *Regional Studies*, *51*(1), 97–115. https://doi.org/10.1080/00343404.2016.1262016

D'Costa, S., & Overman, H. G. (2014). The urban wage growth premium: Sorting or

learning? *Regional Science and Urban Economics*, *48*, 168–179. https://doi.org/10.1016/j.regsciurbeco.2014.06.006

Davis, D. R., & Dingel, J. I. (2019). A Spatial Knowledge Economy. *American Economic Review*, *109*(1), 153–170. https://doi.org/10.1257/aer.20130249

de Dominicis, L. (2014). Inequality and Growth in European Regions: Towards a Place-based Approach. *Spatial Economic Analysis*, *9*(2), 120–141. https://doi.org/10.1080/17421772.2014.891157

de Dominicis, L., Florax, R. J. G. M., & de Groot, H. L. F. (2013). Regional clusters of innovative activity in Europe: are social capital and geographical proximity key determinants? *Applied Economics*, *45*(17), 2325–2335. https://doi.org/10.1080/00036846.2012.663474

De la Roca, J., & Puga, D. (2017). Learning by Working in Big Cities. *The Review of Economic Studies*, *84*(1), 106–142. Retrieved from http://dx.doi.org/10.1093/restud/rdw031

Dell, M. (2010). The Persistent Effects of Peru's Mining *Mita*. *Econometrica*, *78*(6), 1863–1903. https://doi.org/10.3982/ECTA8121

Desdoigts, A. (1999). Patterns of Economic Development and the Formation of Clubs. *Journal of Economic Growth*, *4*(3), 305–330. https://doi.org/10.1023/A:1009858603947

Dettori, B., Marrocu, E., & Paci, R. (2012). Total Factor Productivity, Intangible Assets and Spatial Dependence in the European Regions. *Regional Studies*, *46*(10), 1401–1416. https://doi.org/10.1080/00343404.2010.529288

Dijkstra, L., Poelman, H., & Rodríguez-Pose, A. (2018). *The Geography of EU Discontent* (No. WP 12/2018).

Dijkstra, L., Poelman, H., & Rodríguez-Pose, A. (2019). The geography of EU discontent. *Regional Studies*, 1–17. https://doi.org/10.1080/00343404.2019.1654603

Doner, R. F., & Schneider, B. R. (2016). The Middle-Income Trap: More Politics than Economics. *World Politics*, *68*(4), 608–644. https://doi.org/DOI: 10.1017/S0043887116000095

Donges, A., Meier, J.-M. A., & Silva, R. (2017). The Impact of Institutions on Innovation. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2815541

Dunford, M., & Smith, A. (2009). Catching Up or Falling Behind? Economic Performance and Regional Trajectories in the "New Europe"*. *Economic Geography*, *76*(2), 169–195. https://doi.org/10.1111/j.1944-8287.2000.tb00139.x

Duranton, G., & Monastiriotis, V. (2002). Mind the Gaps: The Evolution of Regional Earnings Inequalities in the U.K., 1982–1997. *Journal of Regional Science*, *42*(2), 219–256. https://doi.org/10.1111/1467-9787.00257

Duranton, G., & Puga, D. (2004). Micro-Foundations of Urban Agglomeration Economies. In J. V. Henderson & J.-F. Thisse (Eds.), *Handbook of Regional and Urban Economics* (Vol. 4, pp. 2063–2117). https://doi.org/https://doi.org/10.1016/S1574-0080(04)80005-1

Durlauf, S. N., & Johnson, P. A. (1995). Multiple regimes and cross-country growth behaviour. *Journal of Applied Econometrics*, *10*(4), 365–384. https://doi.org/10.1002/jae.3950100404

Durlauf, S. N., Johnson, P. A., & Temple, J. R. W. (2005). Growth Econometrics. In Philippe Aghion & S. N. Durlauf (Eds.), *Handbook of Economic Growth* (Vol. 1, pp. 555–677). https://doi.org/10.1016/S1574-0684(05)01008-7

Durlauf, S. N., Kourtellos, A., & Tan, C. M. (2008). Are Any Growth Theories Robust? *The Economic Journal*, *118*(527), 329–346. https://doi.org/10.1111/j.1468-0297.2007.02123.x

Edin, P.-A., Evans, T., Graetz, G., Hernnäs, S., & Michaels, G. (2019). Individual consequences of occupational decline. *CEPR Discussion Paper No. DP13808*. Retrieved from https://ssrn.com/abstract=3428328

Eichengreen, B., Park, D., & Shin, K. (2012). When Fast-Growing Economies Slow Down: International Evidence and Implications for China. *Asian Economic Papers*, *11*(1), 42–87. https://doi.org/10.1162/ASEP_a_00118

Eichengreen, B., Park, D., & Shin, K. (2014). Growth slowdowns redux. *Japan and the World Economy*, *32*, 65–84. https://doi.org/10.1016/J.JAPWOR.2014.07.003

European Commission. (2017a). Competitiveness in low-income and low-growth regions: The lagging regions report. In *SWD(2017) 132 final*. Retrieved from http://ec.europa.eu/regional_policy/en/information/publications/reports/2017/competitiveness-in-low-income-and-low-growth-regions-the-lagging-regions-report

European Commission. (2017b). *My Region, My Europe, Our Future: Seventh report on economic, social and territorial cohesion* (L. Dijkstra, ed.). Retrieved from http://ec.europa.eu/regional_policy/en/information/cohesion-report/

Fagerberg, J., & Verspagen, B. (1996). Heading for Divergence? Regional Growth in Europe Reconsidered. *JCMS: Journal of Common Market Studies*, *34*(3), 431–448. https://doi.org/10.1111/j.1468-5965.1996.tb00580.x

Farole, T., Rodríguez-Pose, A., & Storper, M. (2011). Human geography and the institutions that underlie economic growth. *Progress in Human Geography*, *35*(1), 58–80. https://doi.org/10.1177/0309132510372005

Feldman, M. P., Guy, F., & Iammarino, S. (2019). Regional income disparities, monopoly and finance. In *CIMR Research Working Paper Series* (No. 43). London, UK.

Fiaschi, D., & Lavezzi, A. M. (2003). Distribution Dynamics and Nonlinear Growth. *Journal of Economic Growth*, *8*(4), 379–401. https://doi.org/10.1023/A:1026204900651

Filippetti, A., & Archibugi, D. (2011). Innovation in times of crisis: National systems of innovation, structure, and demand. *Research Policy*, *40*(2), 179–192. https://doi.org/10.1016/j.respol.2010.09.001

Filippetti, A., Guy, F., & Iammarino, S. (2019). Regional disparities in the effect of training on employment. *Regional Studies*, *53*(2), 217–230. https://doi.org/10.1080/00343404.2018.1455177

Fingleton, B., Garretsen, H., & Martin, R. (2012). RECESSIONARY SHOCKS AND REGIONAL EMPLOYMENT: EVIDENCE ON THE RESILIENCE OF U.K. REGIONS. *Journal of Regional Science*, *52*(1), 109–133. https://doi.org/10.1111/j.1467-9787.2011.00755.x

Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*, *12*(2), 219–245. https://doi.org/10.1177/1077800405284363

Fratesi, U., & Rodríguez-Pose, A. (2016). The crisis and regional employment in Europe: what role for sheltered economies? *Cambridge Journal of Regions, Economy and Society*, *9*(1), 33–57. https://doi.org/10.1093/cjres/rsv032

Gill, I. S., & Kharas, H. (2007). *An East Asian renaissance: ideas for economic growth*. Washington, DC: The World Bank.

Gill, I. S., & Kharas, H. (2015). The Middle-Income Trap Turns Ten. In *Policy Research Working Papers*. https://doi.org/doi:10.1596/1813-9450-7403

Glawe, L., & Wagner, H. (2016). The Middle-Income Trap: Definitions, Theories and Countries Concerned—A Literature Survey. *Comparative Economic Studies*, *58*(4), 507–538. https://doi.org/10.1057/s41294-016-0014-0

Gollin, D. (2014). The Lewis Model: A 60-Year Retrospective. *Journal of Economic Perspectives*, *28*(3), 71–88. https://doi.org/10.1257/jep.28.3.71

Guiso, L., Sapienza, P., & Zingales, L. (2004). The Role of Social Capital in Financial Development. *American Economic Review*, *94*(3), 526–556. https://doi.org/10.1257/0002828041464498

Hall, R. E., & Jones, C. I. (1999). Why do Some Countries Produce So Much More Output Per Worker than Others? *The Quarterly Journal of Economics*, *114*(1), 83–116. https://doi.org/10.1162/003355399555954

Hassink, R. (2010). Locked in decline? On the role of regional lock-ins in old industrial areas. In R. A. Boschma & R. Martin (Eds.), *The Handbook of Evolutionary Economic Geography* (First, pp. 450–468). Cheltenham, UK: Edward Elgar Publishing.

Hausmann, R., Pritchett, L., & Rodrik, D. (2005). Growth Accelerations. *Journal of Economic Growth*, *10*(4), 303–329. https://doi.org/10.1007/s10887-005-4712-0

Hausmann, R., Rodriguez, F. R., & Wagner, R. A. (2006). *Growth Collapses* (No. 136). Retrieved from http://ssrn.com/abstract=902392

Hobijn, B., & Franses, P. H. (2000). Asymptotically perfect and relative convergence of productivity. *Journal of Applied Econometrics*, *15*(1), 59–81. https://doi.org/10.1002/(SICI)1099-1255(200001/02)15:1<59::AID-JAE544>3.0.CO;2-1

Hsieh, C.-T., & Klenow, P. J. (2010). Development Accounting. *American Economic Journal: Macroeconomics*, *2*(1), 207–223. https://doi.org/10.1257/mac.2.1.207

Iammarino, S. (2005). An evolutionary integrated view of regional systems of innovation: concepts, measures and historical perspectives. *European Planning Studies*, *13*(4), 497–519. https://doi.org/10.1080/09654310500107084

Iammarino, S., & McCann, P. (2013). *Multinationals and economic geography: Location, technology and innovation*. Edward Elgar Publishing.

Iammarino, S., Rodríguez-Pose, A., & Storper, M. (2017). *Why Regional Development matters for Europe's Economic Future*.

Iammarino, S., Rodríguez-Pose, A., & Storper, M. (2018). Regional inequality in Europe: evidence, theory and policy implications. *Journal of Economic Geography*, 1–26. Retrieved from http://dx.doi.org/10.1093/jeg/lby021

Im, F. G., & Rosenblatt, D. (2013). Middle-Income Traps: A Conceptual and Empirical Survey. In *Policy Research Working Papers*. https://doi.org/doi:10.1596/1813-9450-6594

Iyer, S., Kitson, M., & Toh, B. (2005). Social capital, economic growth and regional development. *Regional Studies*, *39*(8), 1015–1040. https://doi.org/10.1080/00343400500327943

Judt, T. (1996). *A Grand Illusion? An Essay on Europe*. New York, NY: Hill and Wang.

Kharas, H., & Kohli, H. (2011). What Is the Middle Income Trap, Why do Countries Fall into It, and How Can It Be Avoided? *Global Journal of Emerging Market Economies*, *3*(3), 281–289. https://doi.org/10.1177/097491011100300302

Krugman, P. (1991). Increasing Returns and Economic Geography. *Journal of Political Economy*, *99*(3), 483–499. https://doi.org/10.1086/261763

Le Pen, Y. (2011). A pair-wise approach to output convergence between European

regions. *Economic Modelling*, *28*(3), 955–964. https://doi.org/10.1016/J.ECONMOD.2010.11.006

Lee, K. (2013). *Schumpeterian analysis of economic catch-up: Knowledge, path-creation, and the middle-income trap*. Cambridge, UK: Cambridge University Press.

Lee, N., & Rodríguez-Pose, A. (2013). Innovation and spatial inequality in Europe and USA. *Journal of Economic Geography*, *13*(1), 1–22. Retrieved from http://dx.doi.org/10.1093/jeg/lbs022

Lewis, W. A. (1954). Economic Development with Unlimited Supplies of Labour. *The Manchester School*, *22*(2), 139–191. https://doi.org/10.1111/j.1467-9957.1954.tb00021.x

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, *22*(1), 3–42. https://doi.org/10.1016/0304-3932(88)90168-7

Magrini, S. (2004). Regional (DI)Convergence. In J. V. Henderson & J.-F. B. T.-H. of R. and U. E. Thisse (Eds.), *Cities and Geography* (Vol. 4, pp. 2741–2796). https://doi.org/https://doi.org/10.1016/S1574-0080(04)80019-1

Malecki, E. J. (2012). Regional Social Capital: Why it Matters. *Regional Studies*, *46*(8), 1023–1039. https://doi.org/10.1080/00343404.2011.607806

Martin, R., & Sunley, P. (2006). Path dependence and regional economic evolution. *Journal of Economic Geography*, *6*(4), 395–437. https://doi.org/10.1093/jeg/lbl012

Martin, R., & Tyler, P. (2000). Regional Employment Evolutions in the European Union: A Preliminary Analysis. *Regional Studies*, *34*(7), 601–616. https://doi.org/10.1080/00343400050178410

Maskell, P., & Malmberg, A. (2007). Myopia, knowledge development and cluster evolution. *Journal of Economic Geography*, *7*(5), 603–618. https://doi.org/10.1093/jeg/lbm020

McCann, P. (2020). Perceptions of regional inequality and the geography of discontent: insights from the UK. *Regional Studies*, *54*(2), 256–267. https://doi.org/10.1080/00343404.2019.1619928

Michaels, G. (2008). The Effect of Trade on the Demand for Skill: Evidence from the Interstate Highway System. *Review of Economics and Statistics*, *90*(4), 683–701. https://doi.org/10.1162/rest.90.4.683

Monfort, M., Cuestas, J. C., & Ordóñez, J. (2013). Real convergence in Europe: A cluster analysis. *Economic Modelling*, *33*, 689–694. https://doi.org/10.1016/J.ECONMOD.2013.05.015

Morgan, K. J. (1997). The Learning Region: Institutions, Innovation and Regional Renewal. *Regional Studies*, *31*(5), 491–503. https://doi.org/10.1080/00343409750132289

Nardo, M., Saisana, M., Saltelli, A., Tarantola, S., Hoffmann, A., & Giovannini, E. (2008). *Handbook on Constructing Composite Indicators: Methodology and User Guide*. Retrieved from http://www.oecd.org/els/soc/handbookonconstructingcompositeindicatorsmethodologyanduserguide.htm

North, D. C. (1990). *Institutions, Institutional Change, and Economic Performance*. Cambridge, UK: Cambridge University Press.

Paap, R., & van Dijk, H. K. (1998). Distribution and mobility of wealth of nations. *European Economic Review*, *42*(7), 1269–1293. https://doi.org/10.1016/S0014-2921(97)00088-3

Perez, C., & Freeman, C. (1988). Structural crises of adjustment, business cycles and investment behaviour. In G. Dosi, C. Freeman, R. Nelson, G. Silverberg, & L. Soete (Eds.), *Technical Change and Economic Theory* (pp. 38–66). London, UK: Pinter.

Pesaran, M. H. (2007). A pair-wise approach to testing for output and growth convergence. *Journal of Econometrics*, *138*(1), 312–355. https://doi.org/10.1016/J.JECONOM.2006.05.024

Puga, D. (2010). The Magnitude and Causes of Agglomeration Economies. *Journal of Regional Science*, *50*(1), 203–219. https://doi.org/10.1111/j.1467-9787.2009.00657.x

Quah, D. T. (1993). Empirical cross-section dynamics in economic growth. *European Economic Review*, *37*(2–3), 426–434. https://doi.org/10.1016/0014-2921(93)90031-5

Quah, D. T. (1996a). Regional convergence clusters across Europe. *European Economic Review*, *40*(3), 951–958. https://doi.org/https://doi.org/10.1016/0014-2921(95)00105-0

Quah, D. T. (1996b). Twin Peaks: Growth and Convergence in Models of Distribution Dynamics. *The Economic Journal*, *106*(437), 1045–1055. https://doi.org/10.2307/2235377

Quah, D. T. (1997). Empirics for Growth and Distribution: Stratification, Polarization, and Convergence Clubs. *Journal of Economic Growth*, *2*(1), 27–59. https://doi.org/10.1023/A:1009781613339

Redding, S. J. (1996). The Low-Skill, Low-Quality Trap: Strategic Complementarities between Human Capital and R&D. *The Economic Journal*, *106*(435), 458–470. https://doi.org/10.2307/2235260

Redding, S. J. (2002). Path Dependence, Endogenous Innovation, and Growth. *International Economic Review*, *43*(4), 1215–1248. https://doi.org/10.1111/1468-2354.t01-1-00054

Rodríguez-Pose, A. (2013). Do institutions matter for regional development? *Regional Studies*, *47*(7), 1034–1047. https://doi.org/10.1080/00343404.2012.748978

Rodríguez-Pose, A. (2018). The revenge of the places that don't matter (and what to do about it). *Cambridge Journal of Regions, Economy and Society*, *11*(1), 189–209. https://doi.org/10.1093/cjres/rsx024

Rodríguez-Pose, A., & Di Cataldo, M. (2015). Quality of government and innovative performance in the regions of Europe. *Journal of Economic Geography*, *15*(4), 673–706. https://doi.org/10.1093/jeg/lbu023

Rodríguez-Pose, A., & Fratesi, U. (2007). Regional Business Cycles and the Emergence of Sheltered Economies in the Southern Periphery of Europe. *Growth and Change*, *38*(4), 621–648. https://doi.org/10.1111/j.1468-2257.2007.00390.x

Rodríguez-Pose, A., & Garcilazo, E. (2015). Quality of Government and the Returns of Investment: Examining the Impact of Cohesion Expenditure in European Regions. *Regional Studies*, *49*(8), 1274–1290. https://doi.org/10.1080/00343404.2015.1007933

Rodríguez-Pose, A., & Ketterer, T. (2019). Institutional change and the development of lagging regions in Europe. *Regional Studies*, 1–13. https://doi.org/10.1080/00343404.2019.1608356

Rodríguez-Pose, A., & Storper, M. (2006). Better Rules or Stronger Communities? On the Social Foundations of Institutional Change and Its Economic Effects. *Economic Geography*, *82*(1), 1–25. https://doi.org/10.1111/j.1944-8287.2006.tb00286.x

Romer, P. M. (1986). Increasing Returns and Long-Run Growth. *Journal of Political Economy*, *94*(5), 1002–1037. https://doi.org/10.1086/261420

Romer, P. M. (1990). Endogenous Technological Change. *Journal of Political Economy*, *98*(5, Part 2), S71–S102. https://doi.org/10.1086/261725

Roy, A. D. (1951). Some Thoughts on the Distribution of Earnings. *Oxford Economic Papers*, *3*(2), 135–146. Retrieved from http://www.jstor.org/stable/2662082

Sassi, M. (2011). Convergence Across the EU Regions: Economic Composition and Structural Transformation. *International Advances in Economic Research*, *17*(1), 101–115. https://doi.org/10.1007/s11294-010-9286-8

Scoppa, V. (2007). Quality of Human and Physical Capital and Technological Gaps across Italian Regions. *Regional Studies*, *41*(5), 585–599. https://doi.org/10.1080/00343400601120338

Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *The Quarterly Journal of Economics*, *70*(1), 65–94. Retrieved from http://dx.doi.org/10.2307/1884513

Storper, M. (2005). Society, Community, and Economic Development. *Studies in Comparative International Development*, *39*(4), 30–57.

Storper, M. (2018). Separate Worlds? Explaining the current wave of regional economic polarization. *Journal of Economic Geography*, *18*(2), 247–270. Retrieved from http://dx.doi.org/10.1093/jeg/lby011

Tabellini, G. (2010). Culture and Institutions: Economic Development in the Regions of Europe. *Journal of the European Economic Association*, *8*(4), 677–716. https://doi.org/10.1111/j.1542-4774.2010.tb00537.x

Tan, C. M. (2010). No one true path: uncovering the interplay between geography, institutions, and fractionalization in economic development. *Journal of Applied Econometrics*, *25*(7), 1100–1127. https://doi.org/10.1002/jae.1102

van Ark, B., Hao, J. X., Corrado, C., & Hulten, C. (2009). Measuring intangible capital and its contribution to economic growth in Europe. *EIB Papers*, *14*(1), 62–93. Retrieved from http://hdl.handle.net/10419/44905

Vivarelli, M. (2016). The middle income trap: a way out based on technological and structural change. *Economic Change and Restructuring*, *49*(2), 159–193. https://doi.org/10.1007/s10644-015-9166-6

von Tunzelmann, N. (2009). Regional Capabilities and Industrial Regeneration. In M. A. Farshchi, O. E. M. Janne, & P. McCann (Eds.), *Technological Change and Mature Industrial Regions: Firms, Knowledge and Policy* (First). Cheltenham, UK: Edward Elgar Publishing.

Wooldridge, J. M. (2012). *Introductory Econometrics: A Modern Approach* (Fifth Ed.). Mason, OH: South-Western, Cengage Learning.

Ye, L., & Robertson, P. E. (2016). On the Existence of a Middle-Income Trap. *Economic Record*, *92*(297), 173–189. https://doi.org/10.1111/1475-4932.12245

Case Study on Abruzzo, Italy

Bank of Italy, (2019). Economie regionali, L'economia dell'Abruzzo, Economic Update, No. 35.

Bank of Italy, (2019). L'economia dell'Abruzzo, Annual Report, No. 13.

Barca et al., (2009). An agenda for a Reformed Cohesion Policy. A place-based approach to meeting European Union challenges and expectations. Independent Report prepared at the request of Danuta Hübner, Commissioner for Regional Policy, p. 74-75.

Cappiello, G., Galbiati, S., Iapadre, L. P., (2016). Sistemi locali, reti e intermediari dell'innovazione. Il Polo dell'ICT in Abruzzo, *Il Mulino*, Bologna.

Charron, N., Lapuente, V., (2018). Quality of Government in EU Regions: Spatial and Temporal Patterns*, QoG Working Paper Series* 2018:2.

Coughlin, C., Pollard, P. S., (2001). Comparing Manufacturing Export Growth across States: What Accounts for the Differences?. *Federal Reserve Bank of St. Louis Review*, January, pp. 25-40.

Crescenzi, R., Iammarino, S. (2017). Global investments and regional development trajectories: the missing links, *Regional Studies*, *51*(1), 97-115.

Dalum, B., Laursen, K., Villumsen, G., (1998). Structural Change in OECD Export Specialisation Patterns: de-specialisation and stickiness. *International Review of Applied Economics*, Vol. 12, No. 3, pp. 423-443. ISSN 0269-2171. DOI 10.1080/02692179800000017.

Di Giacinto, V., Nuzzo, G., (2005). I fattori dello sviluppo economico abruzzese: un'analisi storica. R*ivista di storia economica*, Società editrice il Mulino, issue 1, 31-62.

Duranton, G., & Monastiriotis, V., (2002). Mind the Gaps: The Evolution of Regional Earnings Inequalities in the U.K., 1982–1997. *Journal of Regional Science*, 42(2), 219–256. https://doi.org/10.1111/1467-9787.00257

Farole, T., Rodríguez-Pose, A., & Storper, M., (2011). Human geography and the institutions that underlie economic growth. *Progress in Human Geography*, 35(1), 58–80. https://doi.org/10.1177/0309132510372005

Golden, M., A. and Picci, L., (2005). Proposal for a new measure of corruption, illustrated with Italian data. *Economics and Politics* 17, 37–75.

Holmberg, S., Rothstein, B., Nasiritousi, N., (2009). Quality of government: What you get. Annual Review of Political Science, 12, 135-161.

Iammarino, S., Rodríguez-Pose, A., & Storper, M., (2017). Why Regional Development matters for Europe's Economic Future.

Iammarino, S., Rodríguez-Pose, A., & Storper, M., (2018). Regional inequality in Europe: evidence, theory and policy implications. *Journal of Economic Geography*, 1–26. Retrieved from http://dx.doi.org/10.1093/jeg/lby021

Iapadre, L. P., (2009). Integrazione internazionale, sistema finanziario e sviluppo dell'economia abruzzese, *Il Mulino*, Bologna, ISBN 978-88-15-13176-8.

Iapadre, L. P., (2011). Trade and Employment in Italy. OECD Trade Policy Working Papers, No. 126, *OECD Publishing.* http://dx.doi.org/10.1787/5kg3nh6j2m20-en

Iapadre, L. P., (2013). Multinazionali estere e dinamica delle esportazioni in Abruzzo. Economia e società in Abruzzo, Rapporto 2012. *Centro regionale di studi e ricerche economico-sociali (CRESA)*, L'Aquila, pp. 175-185, ISSN 2038-8918.

Iapadre, L. P., Prezioso S., (2016). Com'è cambiata la posizione sull'estero del Mezzogiorno durante la "lunga crisi", *Rivista economica del Mezzogiorno*, 2016, n. 4, pp. 745-778. DOI: 10.1432/86266

Kaufmann, D., Kraay, A., Mastruzzi, M., (2010). The Worldwide Governance Indicators: Methodology and Analytical Issues. Policy Research Working Paper Series Number 5430, *The World Bank*, Washington, DC.

Mauro, P., (2004). The persistence of corruption and slow economic growth. *IMF staff papers*, 1–18.

McCann, P., (2015). The regional and urban policy of the European Union: Cohesion, results-orientation and smart specialisation. *Edward Elgar*, Cheltenham UK, Northampton USA, DOI 10.4337/9781783479511

Memedovic, O., Iapadre L. P., (2010). Industrial Development and the Dynamics of International Specialization Patterns. *UNIDO Research and Statistics Branch*, Wien, United Nations Industrial Development Organization.

Mulino, M., (2014). L'economia abruzzese nella crisi globale (a cura di), *Il Mulino*, Bologna, pp. 9-19, ISBN 978-88-15-25087-2.

Nifo, A., Vecchione, G., (2014). Do Institutions Play a Role in Skilled Migration? The Case of Italy. *Regional Studies* 48(10):1628-1649.

Norris, P., (2012). Making democratic governance work: How regimes shape prosperity, welfare, and peace. Cambridge, UK, *Cambridge University Press*.

OECD (2013), Policy Making after Disasters: Helping Regions Become Resilient – The Case of Post-Earthquake Abruzzo, *OECD Publishing*.

Rodríguez-Pose, A., & Storper, M., (2006). Better Rules or Stronger Communities? On the Social Foundations of Institutional Change and Its Economic Effects. *Economic Geography*, 82(1), 1–25. https://doi.org/10.1111/j.1944-8287.2006.tb00286.x

Case Study on Champagne-Ardenne, France

Bosserelle, C. (2001). 'L'économie champardennaise dans les années 1990 : un état des lieux' in Rasselet, G. Les dynamiques du développement régional. Méthodes d'analyse et application à la région Champagne-Ardenne. Reims : Laboratoire d'Analyse des Mouvements Economiques, Presses Universitaires de Reims, pp 19-36.

Conseil départemental de l'Aube. (n.d.). 'Nouvelle extension pour l'Université de technologie de Troyes'. Retrieved from http://www.aube.fr/96-universite-de-technologie-de-troyes.htm

Conseil départemental des Ardennes. (2019). 'Le Pacte Ardennes'. Retrieved from https://cd08.fr/votre-conseil-departemental/demarches-strategiques/le-pacte-ardennes

Cosnard, D. (2018, March 26th). 'Electrolux, autopsie d'un incroyable gâchis industriel', Le Monde. Retrieved from https://www.lemonde.fr/economie/article/2018/03/26/electrolux-anatomie-d-un-incroyable-gachis-industriel_5276299_3234.html

DIRECCTE Champagne-Ardenne. (2014). 'Panorama économique de la Champagne-Ardenne en 2013' Direction régionale des entreprises, de la concurrence, de la consommation, du travail et de l'emploi, Châlons-en-Champagne.

DIRECCTE Grand Est. (2020). 'Taux de chômage localisé dans les territoires du Grand Est. 3e trimestre 2019'. Direction régionale des entreprises, de la concurrence, de la consommation, du travail et de l'emploi Grand Est, Strasbourg.

DREAL Grand Est. (2016). Le profil environnemental de la Champagne-Ardenne, Direction régionale de l'Environnement, de l'Aménagement et du Logement, October 2016.

G10 Website. (n.d.). Retrieved from https://sites.google.com/site/associationg10/home

Galinier, G. (2019, April 7th). 'A Troyes, une université start-up', Le Monde. Retrieved from https://www.lemonde.fr/campus/article/2019/04/07/a-troyes-une-universite-start-up_5446907_4401467.html.

INSEE (2016 and 2018). 'Dossiers complets' for France and Marne, Haute-Marne, Aube and the Ardennes) Retrieved from:

- France: https://www.insee.fr/fr/statistiques/2011101?geo=FRANCE-1#consulter-sommaire
- Marne: https://www.insee.fr/fr/statistiques/2011101?geo=DEP-51
- Haute-Marne: https://www.insee.fr/fr/statistiques/2011101?geo=DEP-52#consulter-sommaire
- Aube: https://www.insee.fr/fr/statistiques/2011101?geo=DEP-10#consulter-sommaire
- Ardennes: https://www.insee.fr/fr/statistiques/2011101?geo=DEP-08#consulter-sommaire

Jaxel-Truer, P. (2019, February 11th). 'A Châlons-en-Champagne, après le départ de l'armée et le redécoupage régional, tout un avenir à réécrire', Le Monde. Retrieved from https://www.lemonde.fr/politique/article/2019/02/11/quand-chalons-en-champagne-a-perdu-ses-militaires-et-sa-fierte_5421863_823448.html

L, L. (2018, February 23rd). 'SAI de Revin (ex-Electrolux) : les 5 dates clés', France TV Info Grand Est. Retrieved from https://france3-regions.francetvinfo.fr/grand-est/ardennes/revin/sai-revin-ex-electrolux-5-dates-cles-1428971.html

Loiseau H., Saliou, M., Wallaert, A. (2013). 'La pauvreté en Champagne-Ardenne' in Insee Flash Champagne-Ardenne n°176, December 2013.

Loiseau H., Saliou, M. (2014). 'Vingt ans d'avolution du tissu productif' in Insee Analyses Champagne-Ardenne n°4, October 2014.

Martini, T., Nieto, V. (2018). 'La croissance, déjà faible, de la population du Grand Est ralentit' in Insee Analyses Grand Est, December 2018.

Rey-Gorez, P. (2019, June 27th). 'La 2ème édition de Planet A s'est ouverte à Châlons-en-Champagne', France Bleu Champagne-Ardenne. Retrieved from https://www.francebleu.fr/infos/climat-environnement/la-2eme-edition-de-planet-a-s-est-ouverte-a-chalons-en-champagne-1561624968

Schéma régional d'aménagement, de développement durable et d'égalité des territoires de la région Grand Est (SRADDET Grand Est) (2019), version adopted the 22nd of November 2019. Retrieved from https://www.grandest.fr/wp-content/uploads/2019/11/sraddet-ge-rapport-1sur3-diagnostic-vdef.pdf

Schilde, P. (2018, June 25th). 'Itron annonce la fermeture du site de Reims', L'Usine Nouvelle. Retrieved from https://www.usinenouvelle.com/article/itron-annonce-la-fermeture-du-site-de-reims.N711629.

Tecsom (2019, September 30th). 'Le plus grand aéroport du monde s'habille en Tecsom', retrieved from https://tecsom.com/actualites/le-plus-grand-aeroport-du-monde-s-habille-en-tecsom

Van Lu, A. (2014). 'La croissance économique depuis 20 ans en Champagne-Ardenne' in Insee Flash Champagne-Ardenne n°181, June 2014.

Vie publique. (2016, January 5th). 'Qu'est-ce-qu'un conseil regional?'. Retrieved from https://www.vie-publique.fr/fiches/les-regions

Vie publique. (2018a, April 11th). 'Qu'est-ce-qu'un préfet de région ?'. Retrieved from https://www.vie-publique.fr/fiches/20170-le-role-du-prefet-region

Vie publique. (2018b, April 26th). 'Quelles sont les compétences exercées par les départements ?'. Retrieved from https://www.vie-publique.fr/fiches/19620-les-competences-des-departements-loi-notre-loi-maptam

Case Study on Jadranska Hrvatska, Croatia

Act on regional development of Republic of Croatia (Official Gazette 147/14 and 123/17)

Annoni, P.Dijkstra, L (2019): The EU Regional Competitiveness Index, available at: https://ec.europa.eu/regional_policy/sources/docgener/work/2019_03_rci2019.pdf (retrieved 31 January, 2020).

Aralica, Z., Račić, D., Redžepagić, D. (2008) Research and development activity as a growth factor of foreign owned SMEs in selected Central and Eastern European countries, Zbornik radova Ekonomskog Fakulteta u Rijeci, 26 (2), pp. 279–300.

Bićanić, I., (1997). Mjerenje veličine i promjena neslužbenog gospodarstva. Financijska praksa, 21(1-2), pp. 15-28.

Maleković, S., Puljiz, J., Bartlett, W. (2011) Decentralisation and regional policy in Croatia: the impact of EU accession and the prospect of territorial reorganisation. LSEE Papers on Decentralisation and Regional Policy in South Eastern Europe (5). The London School of Economics and Political Science, London, UK.

Maleković, S., Puljiz, J., Keser, I. (2018) The Impact Of Cohesion Policy On Croatia's Regional Policy And Development, POLO-Cro28 Policy Paper, Institute for Development and International Relations – IRMO.

Morgan, K. (2002). English question: regional perspectives on a fractured nation. Regional Studies, 36(7), 797-810.

Morgan, K. (2006). Devolution and development: Territorial justice and the North-South divide. Publius: Journal of Federalism, 36(1), 189-206.

Muringani, J., Fitjar, R. D., & Rodríguez-Pose, A. (2019). Decentralisation, quality of government and economic growth. Revista de Economía Mundial/Journal of World Economy, 51, 25-52.

Nestić, D., Babić, Z. & Blažević Burić, S. (2018) Minimum wage in Croatia: sectoral and regional perspectives, Economic Research-Ekonomska Istraživanja, 31(1),1981-2002. https://doi.org/10.1080/1331677X.2018.1473787

NORTH D. C. (1991) Institutions, Institutional Change and Economic Performance. Cambridge University Press, Cambridge.

Ott, K. (ur.), 2004.Pridruživanje Hrvatske Europskoj uniji – izazovi institucionalnih prilagodbi. Zagreb: Institut za javne financije : Zaklada Friedrich Eber

Ott, K., Bronić, M., Petrušić, M. and Stanić, B., 2016. Budget transparency in Croatian counties, cities and municipalities (November 2015 – March 2016). Newsletter, No. 107.

Ott, K., Bronić, M., Petrušić, M. and Stanić, B., 2017. Budget transparency in Croatian counties, cities and municipalities (November 2016 – March 2017). Newsletter, No. 112.

Ott, K., Bronić, M., Petrušić, M. and Stanić, B., 2018. Budget transparency in Croatian counties, cities and municipalities (November 2017 – March 2018). Newsletter, No. 115.

Ott K., Bronić, M., Stanić, B. (2018) Pomoći Europske unije županijama, gradovima i općinama 2015. i 2016. Newsletter 114/2018. Institut za javne financije.

Available at:http://www.ijf.hr/hr/publikacije/serijske-publikacije/12/newsletter/110/pomocieuropske-unije-zupanijama-gradovima-i-opcinama-2015-i-2016/1370/ (retrieved 1 February 2020).

Ott, K., Bronić, M. and Stanić, B., 2019. Budget transparency in Croatian counties, cities and municipalities (November 2018 – March 2019). Newsletter, No. 117

Puljiz, J., Maleković, S. (2013) Current situation and future perspectives of regional policy in Croatia. Available at SSRN 2238654.

Raguž Krištić, I., Družić, I., Tica, J. (2016) Impact of the transition on the total factor productivity in Croata, Zbornik radova Ekonomskog fakulteta u Rijeci, Vol. 34 (2), pp. 271-308.

Regulation on Development index (Official Gazette 131/17).

Rodríguez-Pose, A., Psycharis, J., Tselios, V. (2013) Public investment and regional growth and convergence: Evidence from Greece, Papers in Regional Science; Special Issue: Productivity and financing of regional transport infrastructure, 91 (3), pp. 543–568.

Tiebout, C.M. (1956). A pure theory of local expenditures. Journal of Political Economy, 64(5), 416-424.

VEBLEN T. (1919) The Place of Science in Modern Civilization and Other Essays. B. W. Huebsch, New York, NY

Vuković, V. (2017.): "Political economy of local government in Croatia: winning coalitions, corruption and taxes", December 2017, Public Sector Economics 41(4): 387-420. doi.org/10.3326/pse.41.4.1

World bank Group (2019): COUNTRY PARTNERSHIP FRAMEWORKFOR THE REPUBLIC OF CROATIAFOR THE PERIOD FY19-FY24, available at: http://documents.worldbank.org/curated/en/501721557239562800/pdf/Croatia-Country-Partnership-Framework-for-the-Period-of-FY19-FY24.pdf (retrieved 1 February 2020).

World Bank Group (2020): Doing Business 2020 Indicators – Economic profile of Croatia available at: https://www.doingbusiness.org/content/dam/doingBusiness/country/c/croatia/HRV.pdf (retrieved 12 February 2020).

World Economic Forum (2019): The Global Competitiveness Report 2019, available at: http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf (retrieved 1 February 2020).

Župarić-Iljić, D. (2016): Emigration from the Republic of Croatia after the Accession to the European Union, available at: https://www.fes-croatia.org/fileadmin/user_upload/FES_Iseljavanje_web.pdf (retrieved 1 February 2020).

Case Study on Sydsverige, Sweden

Edquist, Charles (2016). *The Swedish national innovation council: innovation policy governance to replace linearity with holism*. Centre for innovation, research and competence in the learning economy (3).

Forskning- och innovationsrådet i Skåne (FIRS) (2020). Skånes innovationsstrategi för Hållbar Tillväxt. Region Skåne. [online] Available at: https://utveckling.skane.se/siteassets/publikationer_dokument/firs_innovationsstrategi_2020_lowrez.pdf [Accessed 2020-01-28].

Governmental Bill 1972:111

Government offices of Sweden (2012). The Swedish innovation strategy. [online] Available at: https://www.government.se/contentassets/cbc9485d5a34467296322585811827 3b/the-swedish-innovation-strategy [Accessed 2020-02-06].

Government offices of Sweden (2015a), The Swedish model of government administration. [online] Available at: https://www.government.se/how-sweden-is-governed/the-swedish-model-of-government-administration/ [Accessed 2020-01-24].

Government offices of Sweden (2015b). Smart Industry – en nyindustrialiseringsstrategi för Sverige. [online] Available at: https://www.regeringen.se/informationsmaterial/2016/01/smart-industri---en-nyindustrialiseringsstrategi-for-sverige/ [Accessed 2020-02-07].

Government offices of Sweden (2018a): https://www.regeringen.se/4971fa/contentassets/b5640fd317d04929990610e1a 20a5383/171823000webb.pdf. [Accessed 2020-02-07].

Government offices of Sweden (2018b): https://www.regeringen.se/4950ea/contentassets/0ae0beff7ac24e1385d4de3042 4b7d02/171817900webb.pdf [Accessed 2020-02-07].

Government offices of Sweden (2019): Sveriges export- och investeringsstrategi. https://www.regeringen.se/4af119/contentassets/767f609718b44d9c9415cf4b82f 44a09/final_exportstrategi_191209.pdf [Accessed 2020-02-07].

Johansson, Pernilla (2019). Så utvecklas sydöstra Sverige. En studie av näringslivets tillväxt och produktivitet. Sydsvenska industri- och handelskammaren. [online] Available at: https://resources.mynewsdesk.com/image/upload/iyurzwravjz3vt8ryxup.pdf [Accessed 2020-01-29].

Kontigo (2014): Integration för tillväxt. https://utveckling.skane.se/siteassets/naringsliv/dokument/rapport_integration-for-tillvaxt_slutgiltig.pdf [Accessed 2020-01-07].

LSE Consulting (2019). Falling into the middle-income trap. A study on the risks for Eu regions to be caught in a development trap. Interim Report.

Miörner, J. (2019): (Re-)shaping regional economies. Regional innovation system dynamics and new industrial path development. Faculty of Social Sciences. Department of Human Geography. CIRCLE.

OECD (2018). OECD Territorial Reviews: The Megaregion of Western Scandinavia. OECD Publishing. [online] Available at: https://read.oecd-ilibrary.org/urban-rural-and-regional-development/oecd-territorial-reviews-the-megaregion-of-western-scandinavia_9789264290679-en#page1 [Accessed 2020-02-02].

OECD (2019). OECD territorial Reviews. Småland-Blekinge sammanfattning: Utvärdering av territorial Review samt studie av integrationsutmaningar. OECD publishing. [online] Available at: https://regionblekinge.se/download/18.792217861699f3648001dc1/1553239340 836/OECD%20Policy%20Highlights%20Småland%20Blekinge%20Svenska%2020 19.pdf [Accessed: 2020-02-06].

Region Blekinge (2019). *Uppföljning av det regionala utvecklingsarbetet*. Strategi och analysverksamhet. [online] Available at: https://regionblekinge.se/download/18.6e0a888216d6c8fbfaa384f4/1570685856 016/Uppföljning%20av%20det%20regionala%20utvecklingsarbetet%20i%20Blek inge%202019.pdf [Accessed 2020-02-04].

Region Skåne (n.d.). Det öppna 2030 – Skånes utmaningar. En uppföljning av den regionala strategin delstrategier. Region Skåne, enheten för samhällsanalys. [online] Available at: https://utveckling.skane.se/siteassets/rus/dokument/skanes-utmaningar_1800814.pdf [Accessed 2020-01-30].

Skills Panorama (n.d.). Non-market services [online] Available at: https://skillspanorama.cedefop.europa.eu/en/sectors/non-marketed-services?field_countries_tid=30 [Accessed 2020-03-02].

Statistiska centralbyrån (SCB) (2017). Stark regional tillväxt 2015. [online] Available at: https://www.scb.se/hitta-statistik/artiklar/2017/Stark-regional-tillvaxt-2015/ [Accessed] 2020-01-30.

Tillväxtverket (2018). En kreativ miljö för företag inom materialteknologi. [online] Available at: https://tillvaxtverket.se/eu-program/inspiration-och-resultat/projektexempel---t-o-m-2-ar/2018-09-25-en-kreativ-miljo-for-foretag-inom-materialteknologi.html [Accessed 2020-01-28].

Tillväxtverket (2019). Skåne-Blekinge. [online] Available at: https://tillvaxtverket.se/eu-program/skane-blekinge.html [Accessed 2020-01-29]

Tillväxtverket (2019). Utvecklingskraft i hela Sverige 2030. Kunskap om regionala förutsättningar för tillväxt. Rapport 0292. [online] Available: https://tillvaxtverket.se/download/18.329faede16d1b2861c15ab9c/1568631909506/Utvecklingskraft%20i%20hela%20Sverige%202030%20rapport%200292.pdf [Accessed 2020-02-05].

Tillväxtverket (n.d.). Europeiska regionala utvecklingsfonden investerar i tillväxt och sysselsättning. [online] Available: https://tillvaxtverket.se/download/18.76e25c0c1551556fb105c02/1465380956337/info_0621_webb.pdf [Accessed 2020-02-05].

APPENDIX

Figures

Figure 31: Distribution of average annual per capita real GDP growth over 2000-2015
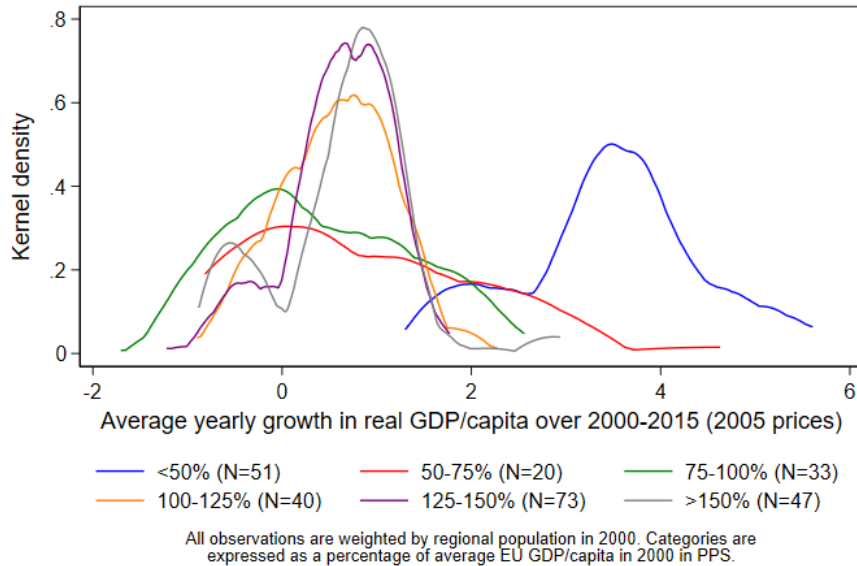

Figure 32: Trend diagram for GDP per capita in EU regions over the 1980-2015 period
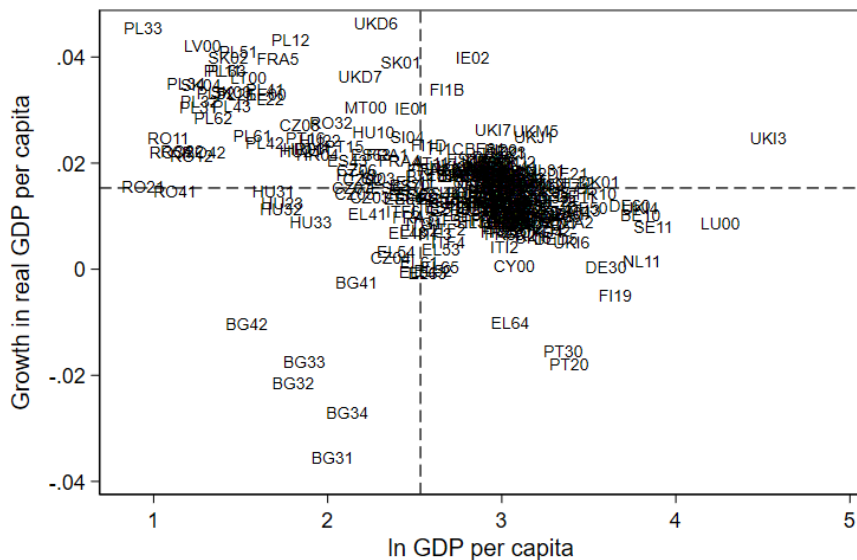
The above Figure shows a trend diagram for growth rates in GDP per capita. For each region, the diagram plots growth rates over the 1980-2015 period against the natural log of initial levels. The graph-area is divided into four quadrants delimited by EU averages in terms of both levels and growth. Accordingly, it is possible to distinguish regions that are moving ahead with respect to the EU average (first quadrant), catching up (second quadrant), falling further behind from the initially low levels (third quadrant), and losing momentum (fourth quadrant). The regions of particular interest for this study are those in the bottom half of the diagram, around or just below

middle-levels of income. Without aiming to provide a comprehensive list, some of these include: Abruzzo, Attiki, Basilicata, Champagne-Ardenne, Drenthe, Franche-Comté, Greater Manchester, Highlands and Islands, Lancashire, Lincolnshire, Lorraine, Marche, Molise, Münster, Picardie, Piemonte, Prov. Hainaut, Prov. Liège, Puglia, Schleswig-Holstein, Umbria, Veneto, Észak-Magyarország, Dytiki Makedonia, Ionia Nisia.

Figure 33: Share of regions falling above the 75th percentile of risk over 1990-2015
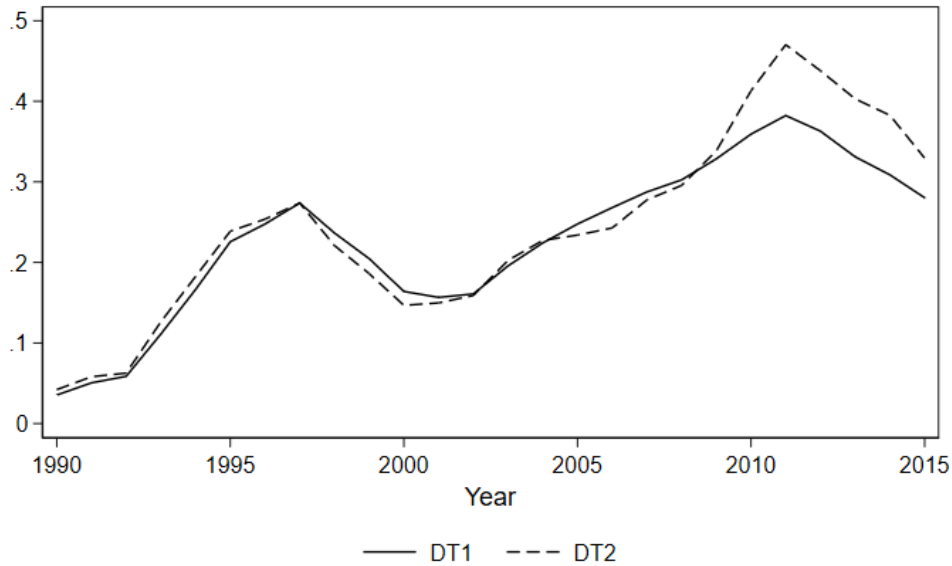

Figure 34: Average risk of being trapped, quartiles of the distribution over 2008-2015
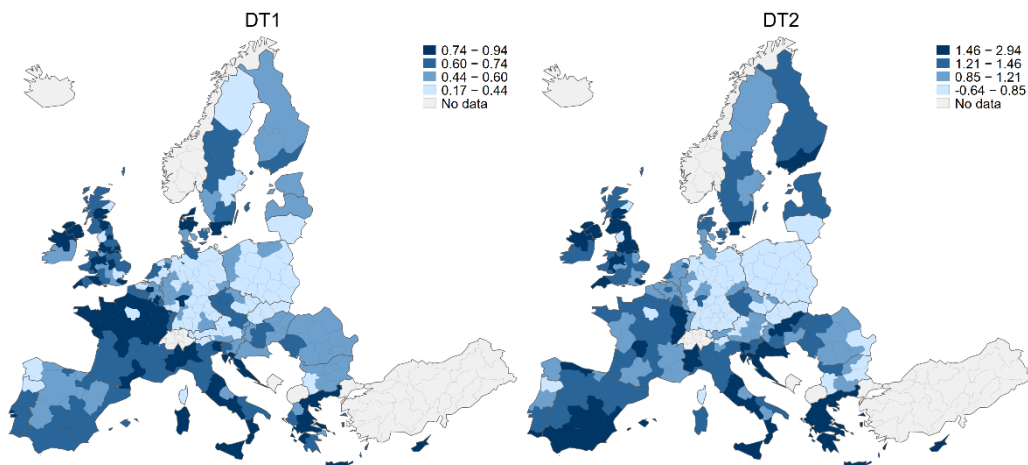
Figure 35: Average DT, GDP/capita subcomponent, quartiles of the distribution over 1990-2015

Figure 36: Average DT, productivity subcomponent, quartiles of the distribution over 1990-2015

Figure 37: Average DT, empl/pop subcomponent, quartiles of the distribution over 1990-2015

Figure 38: Average DT, regional subcomponent, quartiles of the distribution over 1990-2015

DT1

■	0.62 – 0.94
■	0.58 – 0.62
■	0.53 – 0.58
□	0.38 – 0.53
□	No data

DT2

■	0.79 – 2.00
■	0.65 – 0.79
■	0.54 – 0.65
□	-0.01 – 0.54
□	No data

Figure 39: Average DT, Member State subcomponent, quartiles of the distribution, 1990-2015

DT1

■	0.60 – 0.85
■	0.51 – 0.60
■	0.42 – 0.51
□	0.13 – 0.42
□	No data

DT2

■	0.07 – 1.65
■	-0.07 – 0.07
■	-0.20 – -0.07
□	-1.51 – -0.20
□	No data

Figure 40: Average DT, EU subcomponent, quartiles of the distribution over 1990-2015

DT1

■	0.55 – 0.94
■	0.46 – 0.55
■	0.37 – 0.46
□	0.10 – 0.37
□	No data

DT2

■	1.86 – 3.15
■	1.69 – 1.86
■	1.44 – 1.69
□	-0.15 – 1.44
□	No data

Figure 41: Average DT, GDP/capita subcomponent, quartiles of the distribution over 2001-2015
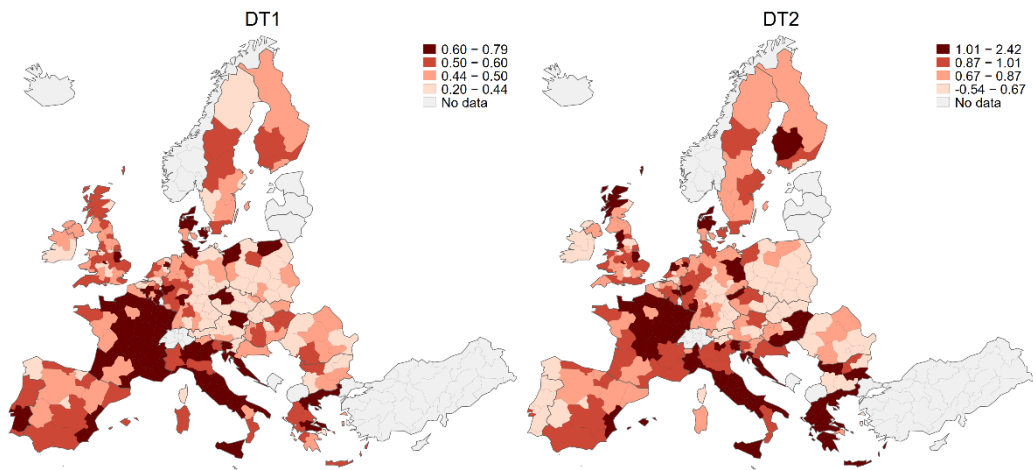

Figure 42: Average DT, productivity subcomponent, quartiles of the distribution over 2001-2015
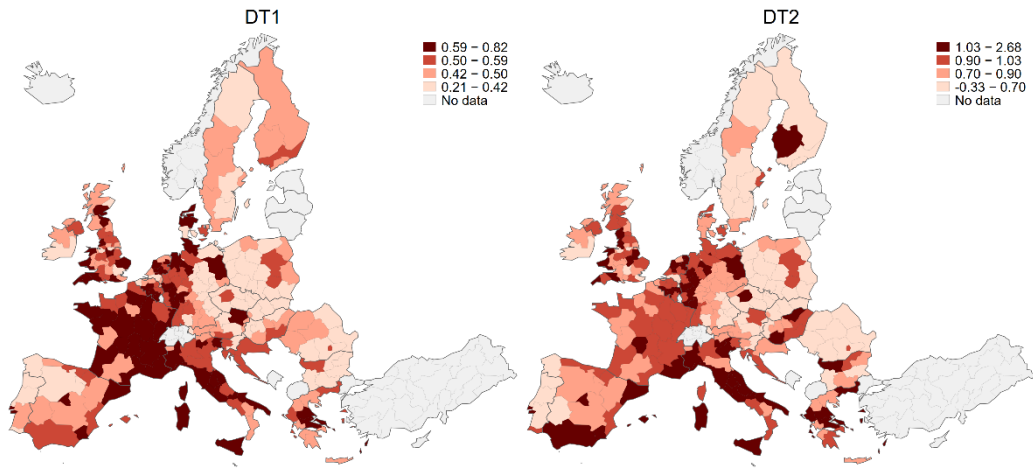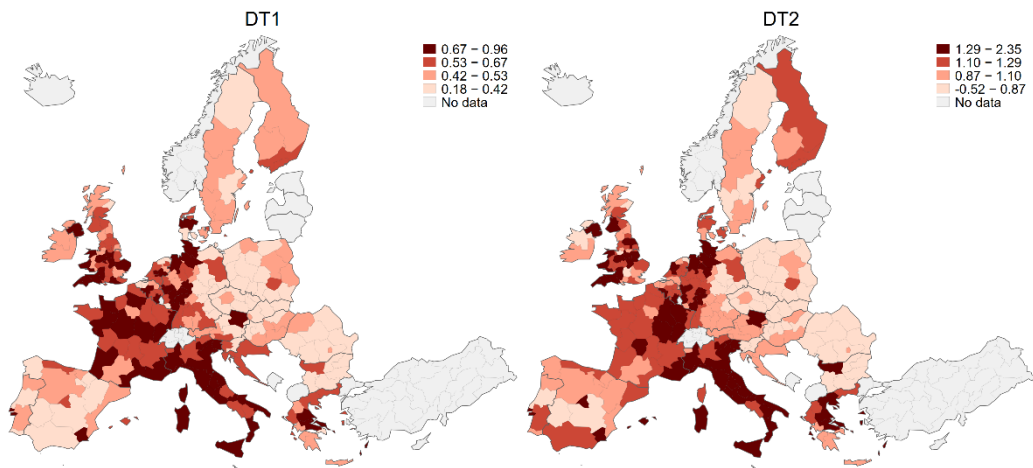

Figure 43: Average DT, empl/pop subcomponent, quartiles of the distribution over 2001-2015
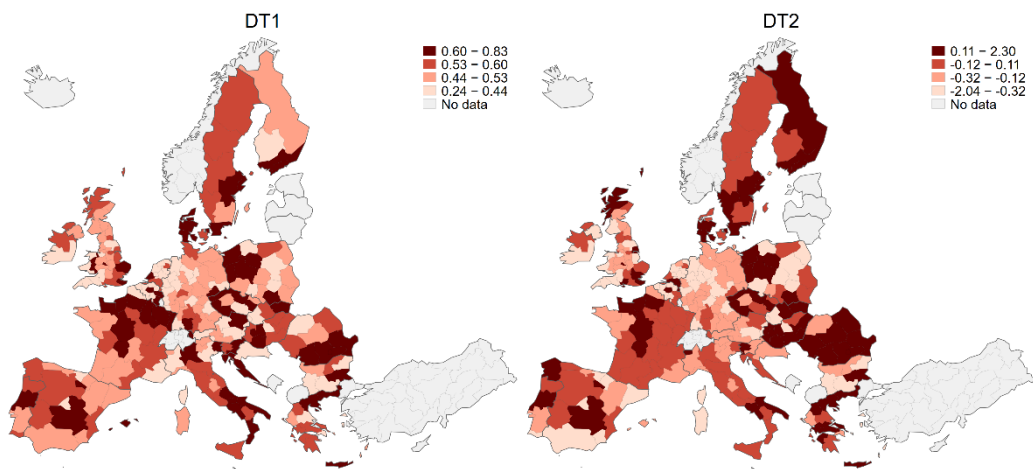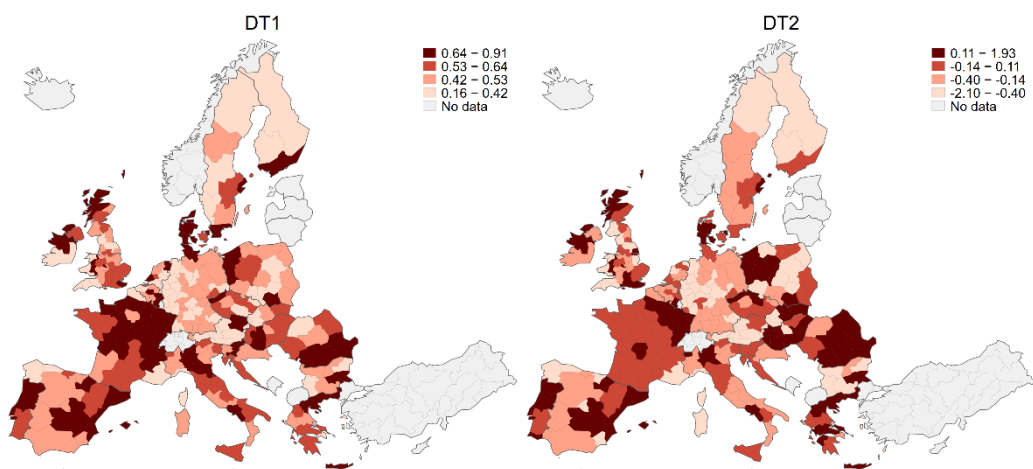
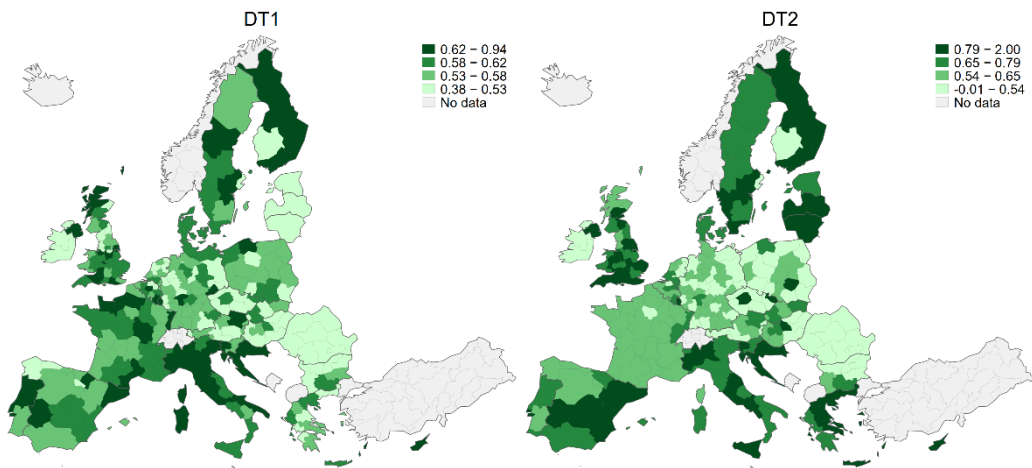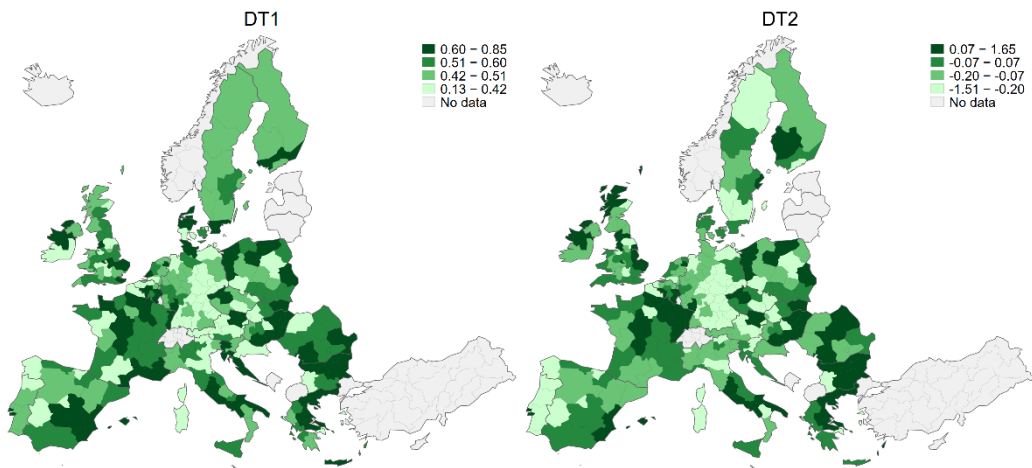**Figure 44: Average DT, regional subcomponent, quartiles of the distribution over 2001-2015**

DT1

■	0.67 – 0.94
■	0.61 – 0.67
■	0.56 – 0.61
■	0.38 – 0.56
■	No data

DT2

■	0.92 – 2.00
■	0.76 – 0.92
■	0.58 – 0.76
■	-0.47 – 0.58
■	No data

Figure 45: Average DT, Member State subcomponent, quartiles of the distribution, 2001-2015

DT1

■	0.64 – 1.00
■	0.53 – 0.64
■	0.42 – 0.53
■	0.00 – 0.42
■	No data

DT2

■	0.09 – 1.16
■	-0.04 – 0.09
■	-0.18 – -0.04
■	-2.75 – -0.18
■	No data

Figure 46: Average DT, EU subcomponent, quartiles of the distribution over 2001-2015

DT1

■	0.67 – 0.94
■	0.51 – 0.67
■	0.36 – 0.51
■	0.09 – 0.36
■	No data

DT2

■	2.33 – 3.68
■	2.06 – 2.33
■	1.73 – 2.06
■	-0.33 – 1.73
■	No data

Figure 47: Average DT, GDP/capita subcomponent, quartiles of the distribution over 2008-2015

DT1

■	0.83 – 1.00
■	0.63 – 0.83
■	0.46 – 0.63
■	0.08 – 0.46
☐	No data

DT2

■	1.39 – 2.43
■	1.11 – 1.39
■	0.80 – 1.11
■	-1.69 – 0.80
☐	No data

Figure 48: Average DT, productivity subcomponent, quartiles of the distribution over 2008-2015

DT1

■	0.75 – 0.96
■	0.58 – 0.75
■	0.42 – 0.58
■	0.08 – 0.42
☐	No data

DT2

■	1.34 – 2.33
■	1.11 – 1.34
■	0.90 – 1.11
■	-0.69 – 0.90
☐	No data
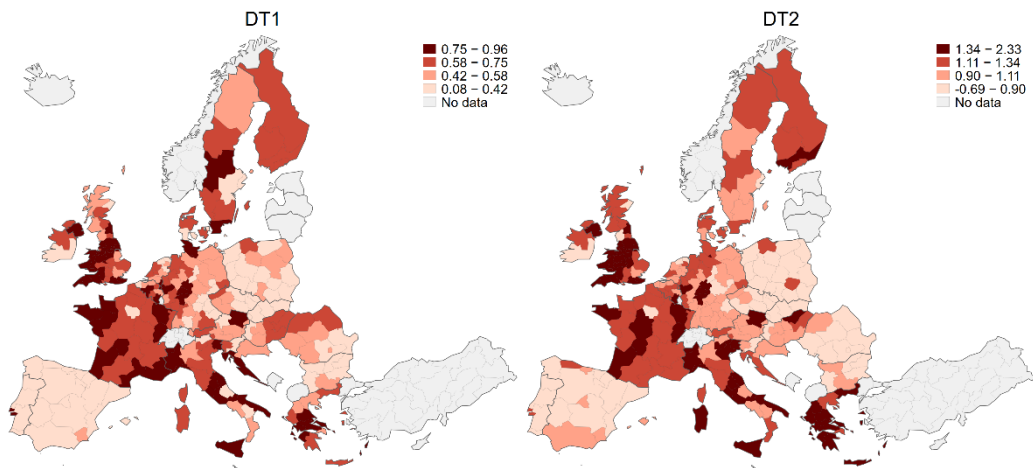
Figure 49: Average DT, empl/pop subcomponent, quartiles of the distribution over 2008-2015

DT1

■	0.75 – 1.00
■	0.56 – 0.75
■	0.33 – 0.56
■	0.08 – 0.33
☐	No data

DT2

■	0.28 – 1.75
■	-0.07 – 0.28
■	-0.47 – -0.07
■	-2.18 – -0.47
☐	No data
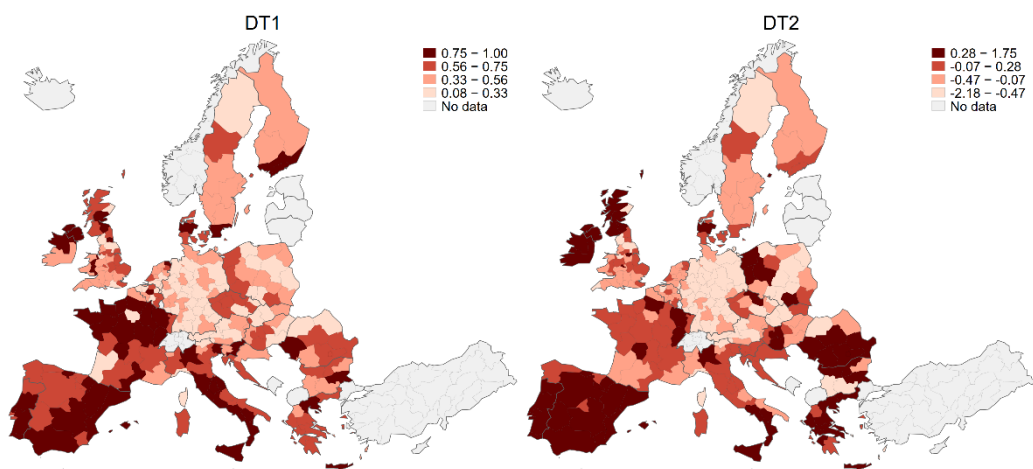
Figure 50: Average DT, regional subcomponent, quartiles of the distribution over 2008-2015
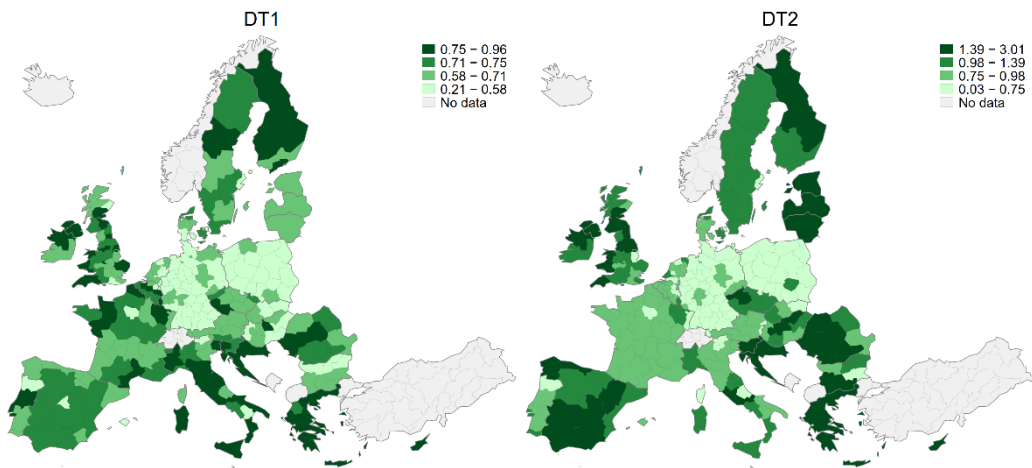
Figure 51: Average DT, Member State subcomponent, quartiles of the distribution, 2008-2015
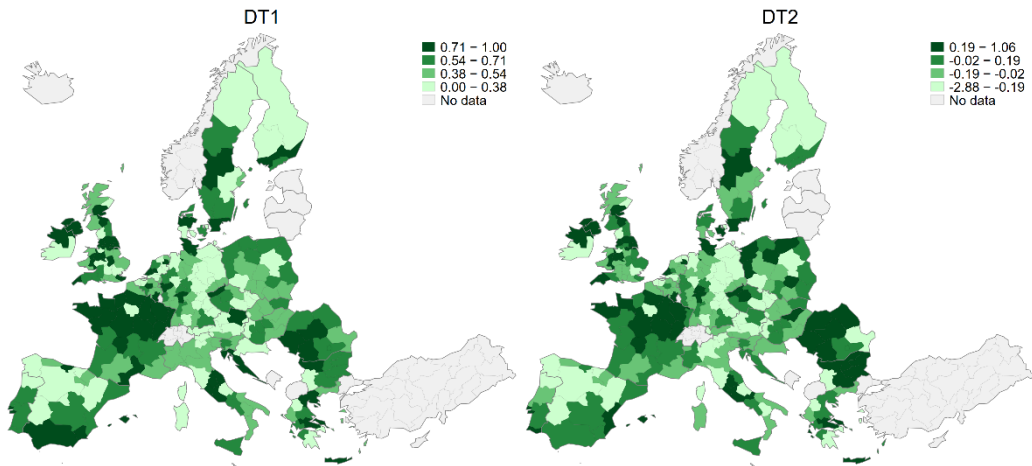
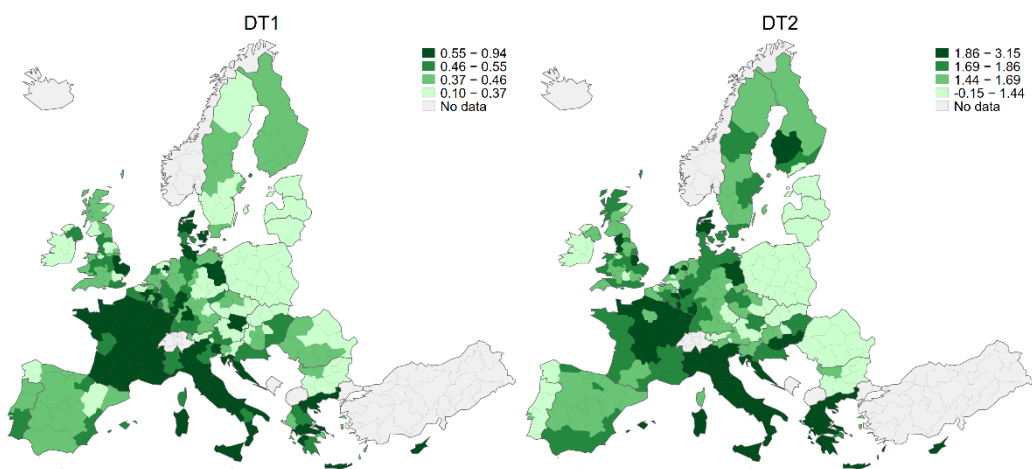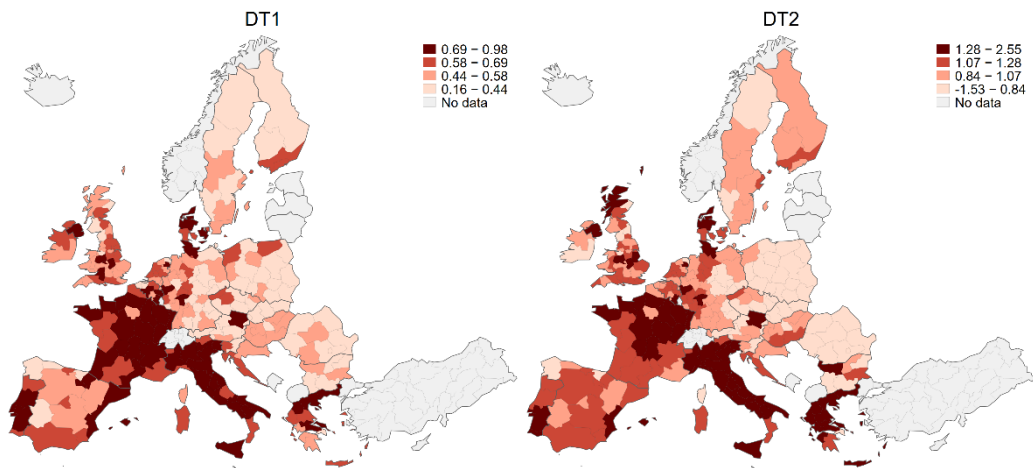**Figure 52: Average DT, EU subcomponent, quartiles of the distribution over 2008-2015**

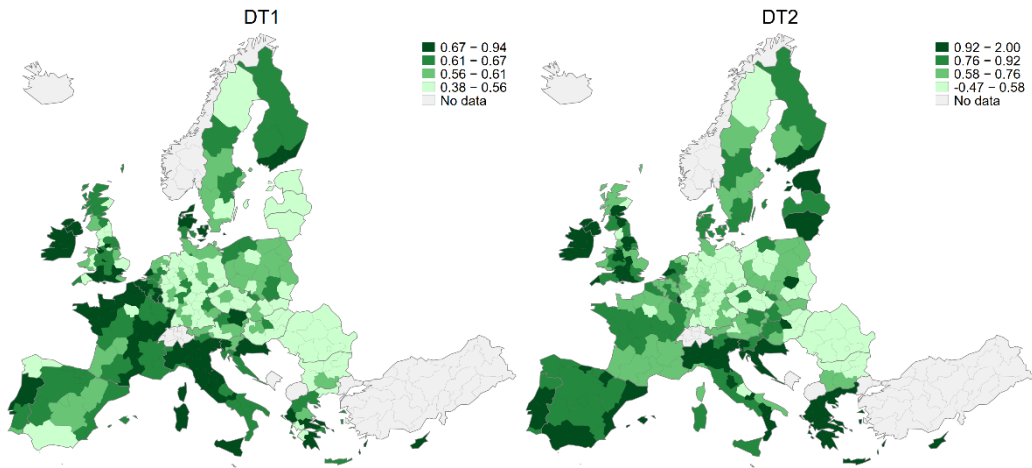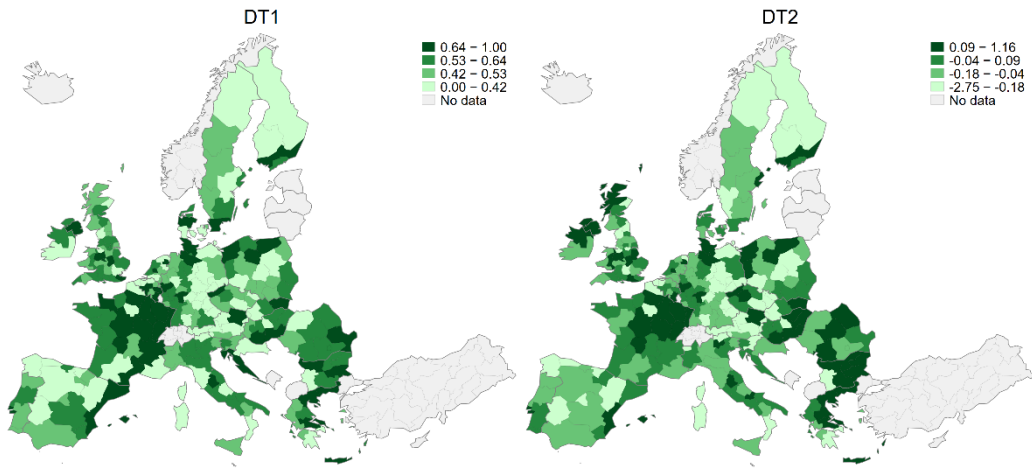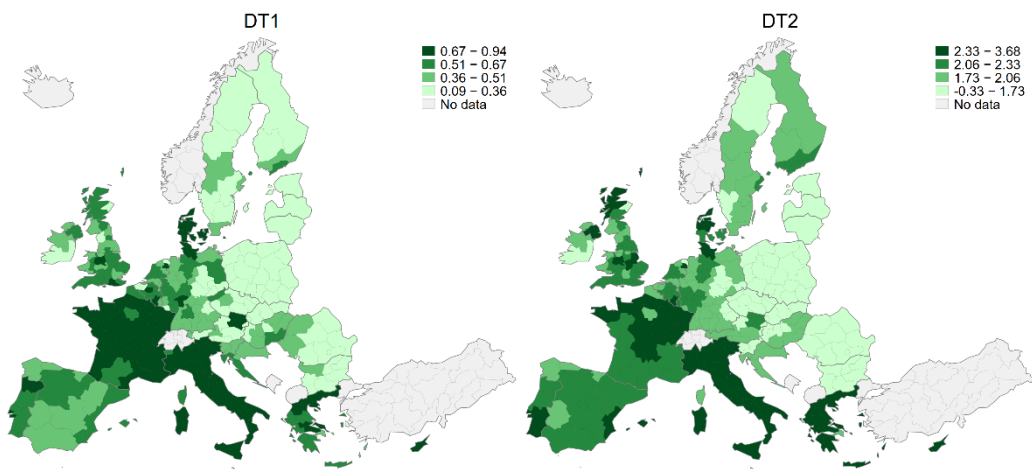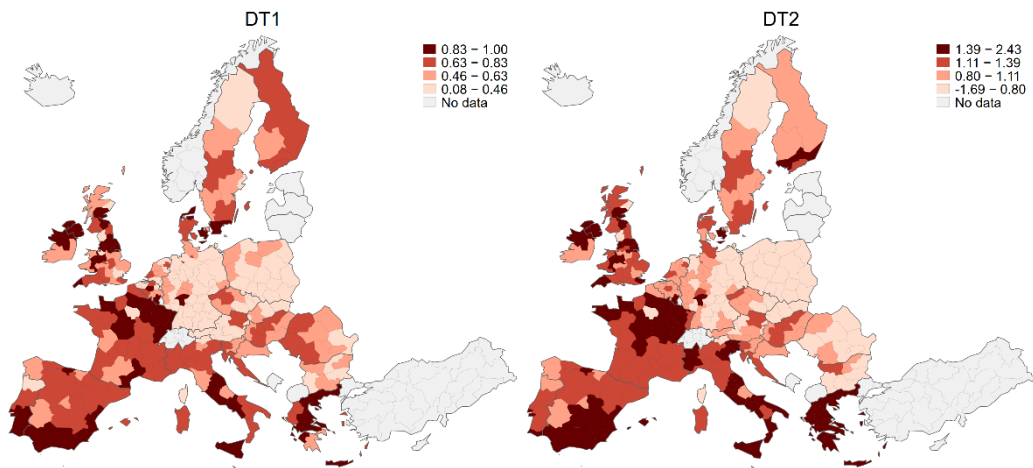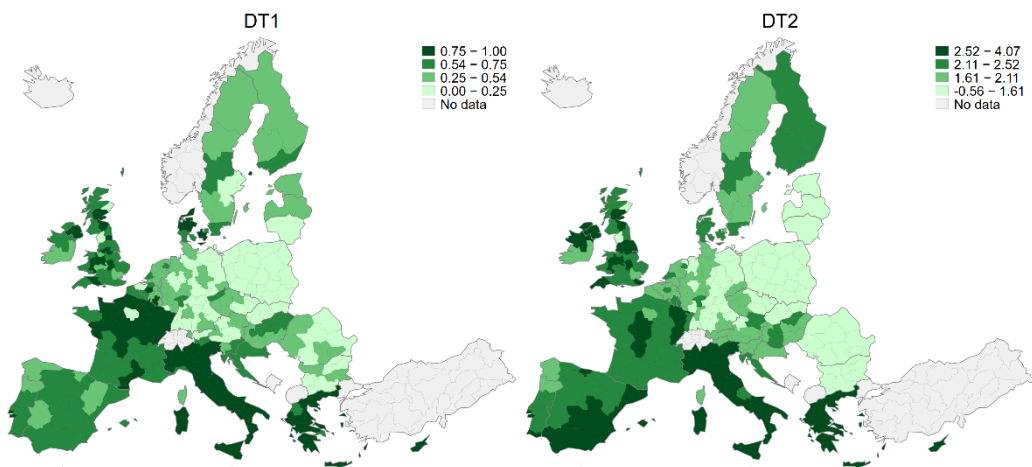**Figure 53: Risk of being trapped by initial levels and top 2 quartiles over 1990-2015**

DT1

Legend:
- In DT at high income (9)
- High-risk at high income (29)
- In DT, stagnating (5)
- High-risk, stagnating (26)
- In DT at low income (0)
- High-risk at low income (4)
- Not in DT or at risk
- No data

DT2

Legend:
- In DT at high income (1)
- High-risk at high income (49)
- In DT, stagnating (3)
- High-risk, stagnating (38)
- In DT at low income (0)
- High-risk at low income (12)
- Not in DT or at risk
- No data
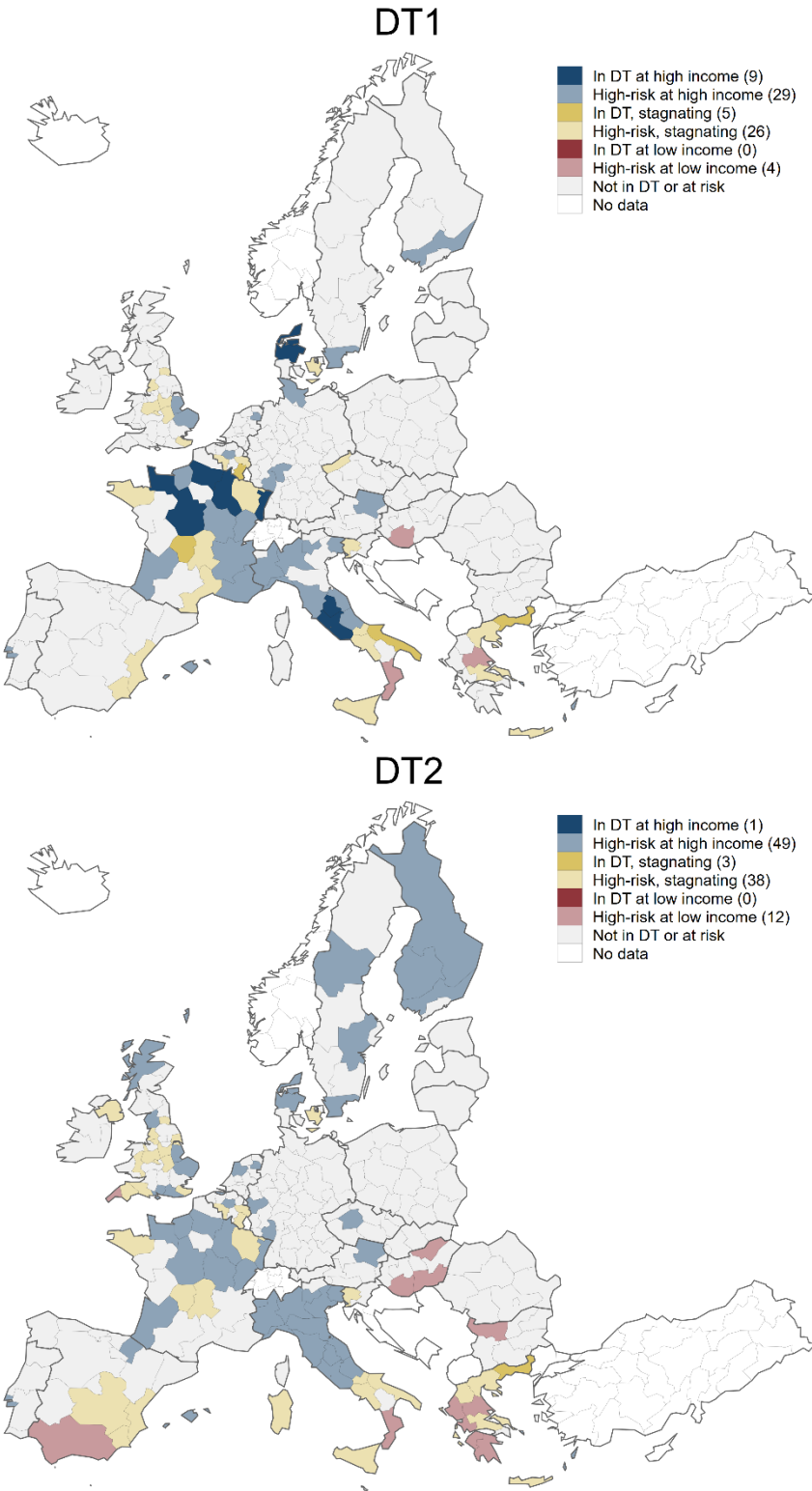
Initial levels of development consider GDP/capita in PPS in the earliest available year. Categories defined relative to EU average. High income: above year average. Middle income: 75-100% of year average. Low income: below 75% of year average. In DT: mean scores above 75th percentile computed over the entire series. At risk: mean scores above median and below 75th percentile over the entire series. Both maps drop regions for which DT could only be computed after 2002.

Figure 54: Conditional averages by DT2 categories and income groups
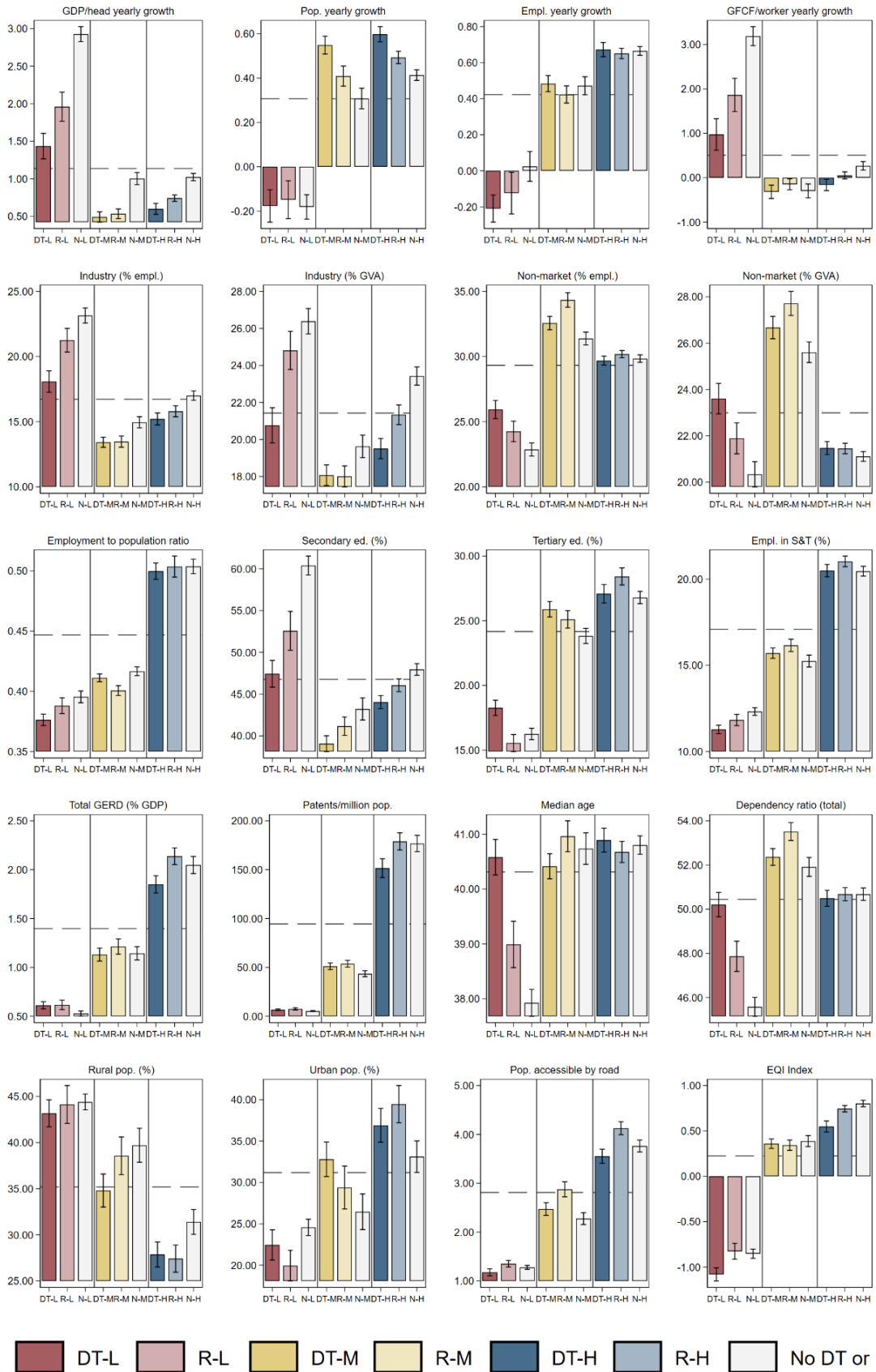
Average values by category over 2000-2015. High income (H): above the year average. Middle income (M): 75-100% of year average. Low income (L): below 75% of year average. In a trap (DT): mean scores above 75th percentile computed over 1990-2015. At risk (R): mean scores above median and below 75th percentile over 1990-2015. Dashed line: EU mean. Vertical bars: 90% CIs.

Figure 55: Risk of a development trap in selected NUTS2 regions in BE, DE, IT and PL

DT1 in selected NUTS2 in BE
The grey-shaded area denotes the IQR of the EU distribution

Bruxelles (RCI)
Prov. Limburg (BE)
Prov. Liège

DT1 in selected NUTS2 in DE
The grey-shaded area denotes the IQR of the EU distribution

Oberbayern
Oberfranken
Rheinhessen-Pfalz
Schleswig-Holstein

DT1 in selected NUTS2 in IT
The grey-shaded area denotes the IQR of the EU distribution

Emilia-Romagna
Lazio
Liguria
Piemonte
Sicilia

DT1 in selected NUTS2 in PL
The grey-shaded area denotes the IQR of the EU distribution

Kujawsko-Pomorskie
Mazowieckie
Opolskie
Zachodniopomorskie

Figure 56: Development traps in the EU, top and bottom 2 regions in 2015
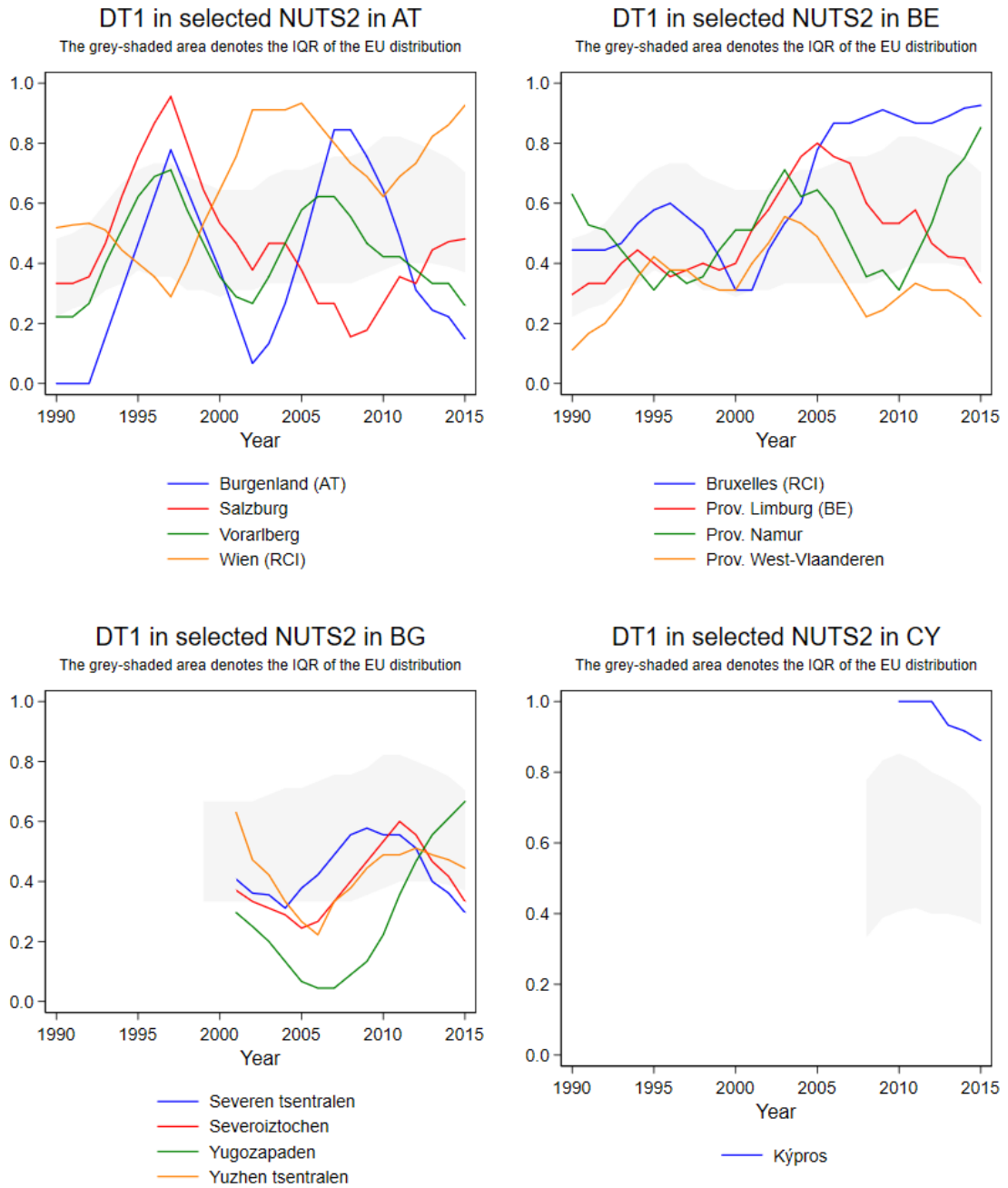
DT1 in selected NUTS2 in CZ
The grey-shaded area denotes the IQR of the EU distribution
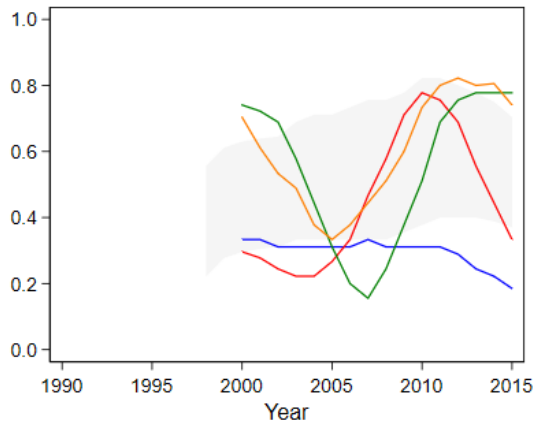
Legend:
- Jihovýchod
- Jihozápad
- Praha (RCI)
- Severozápad

DT1 in selected NUTS2 in DE
The grey-shaded area denotes the IQR of the EU distribution
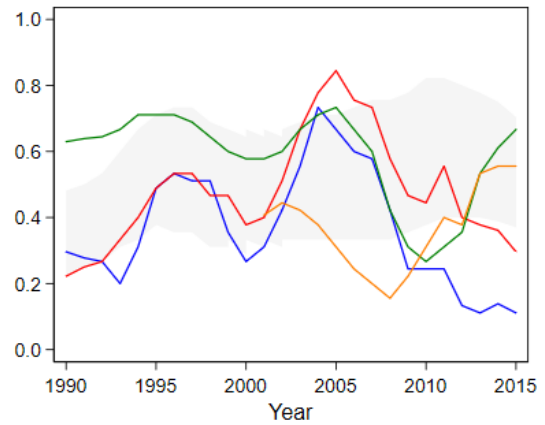
Legend:
- Braunschweig
- Freiburg
- Rheinhessen-Pfalz
- Sachsen-Anhalt

DT1 in selected NUTS2 in DK
The grey-shaded area denotes the IQR of the EU distribution
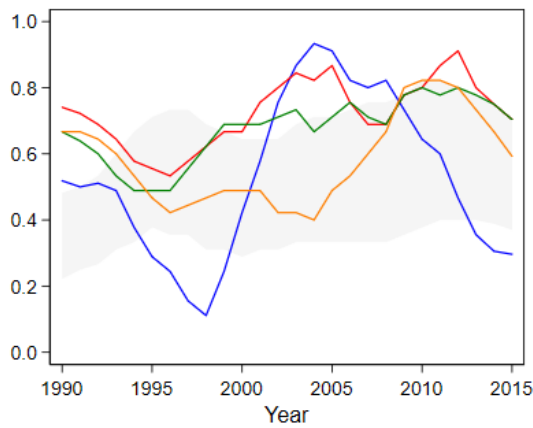
Legend:
- Hovedstaden
- Midtjylland
- Nordjylland
- Sjælland

DT1 in selected NUTS2 in EE
The grey-shaded area denotes the IQR of the EU distribution
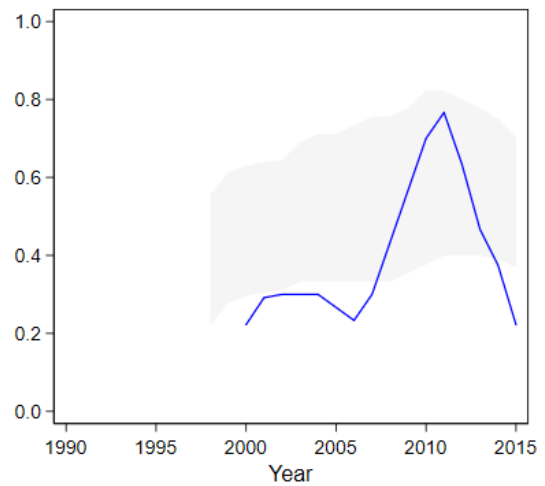
Legend:
- Eesti

DT1 in selected NUTS2 in EL

The grey-shaded area denotes the IQR of the EU distribution

Legend:
- Anatoliki Makedonia, Thraki
- Attiki
- Dytiki Makedonia
- Sterea Ellada

DT1 in selected NUTS2 in ES

The grey-shaded area denotes the IQR of the EU distribution

Legend:
- Ciudad Autónoma de Ceuta
- Comunidad Foral de Navarra
- Comunidad de Madrid
- Extremadura

DT1 in selected NUTS2 in FI

The grey-shaded area denotes the IQR of the EU distribution
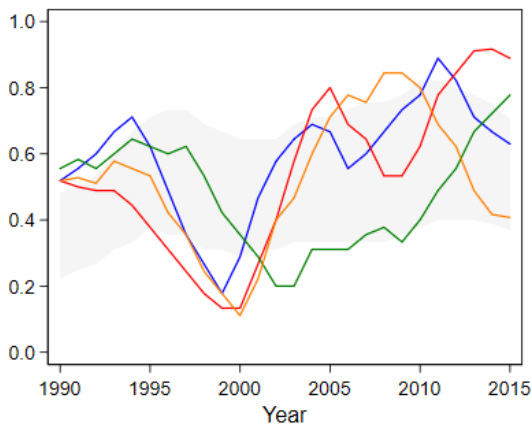
Legend:
- Etelä-Suomi
- Helsinki-Uusimaa
- Länsi-Suomi
- Åland

DT1 in selected NUTS2 in FR

The grey-shaded area denotes the IQR of the EU distribution
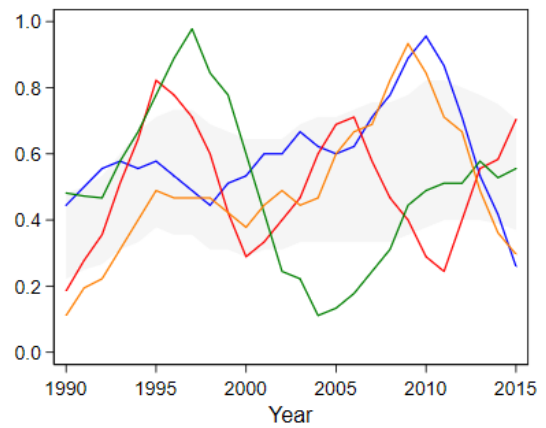
Legend:
- Auvergne
- Corse
- La Réunion
- Midi-Pyrénées

DT1 in selected NUTS2 in HR
The grey-shaded area denotes the IQR of the EU distribution
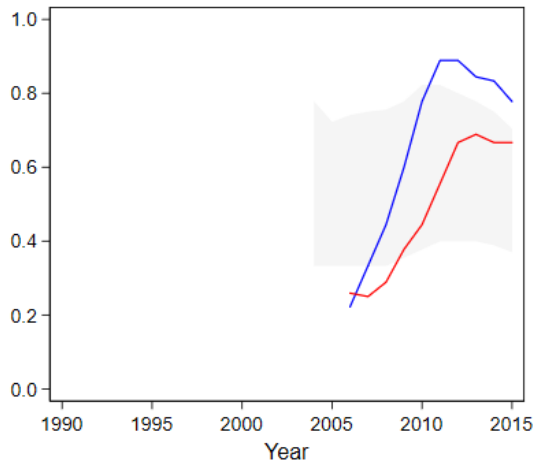
Jadranska Hrvatska
Kontinentalna Hrvatska

DT1 in selected NUTS2 in HU
The grey-shaded area denotes the IQR of the EU distribution
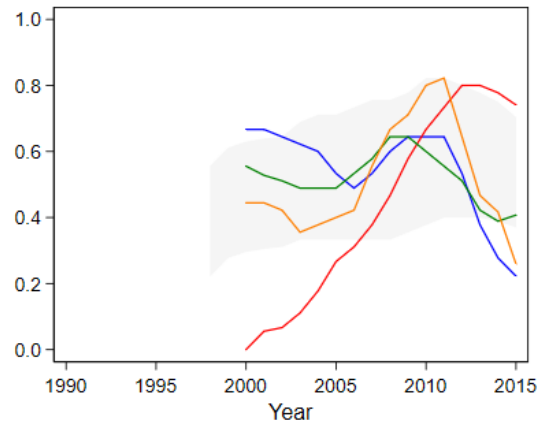
Dél-Alföld
Közép-Magyarország
Észak-Alföld
Észak-Magyarország

DT1 in selected NUTS2 in IE
The grey-shaded area denotes the IQR of the EU distribution
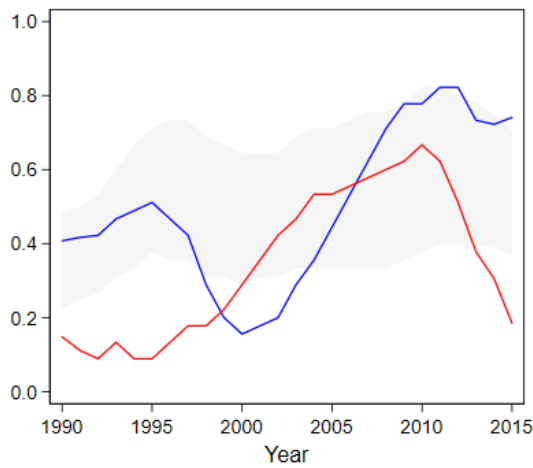
Border, Midland and Western
Southern and Eastern

DT1 in selected NUTS2 in IT
The grey-shaded area denotes the IQR of the EU distribution
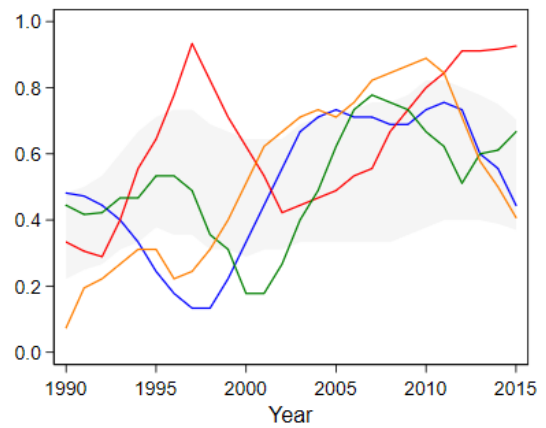
Basilicata
Sicilia
Valle d'Aosta/Vallée d'Aoste
Veneto

DT1 in selected NUTS2 in LT
The grey-shaded area denotes the IQR of the EU distribution

Lietuva

DT1 in selected NUTS2 in LU
The grey-shaded area denotes the IQR of the EU distribution

Luxembourg

DT1 in selected NUTS2 in LV
The grey-shaded area denotes the IQR of the EU distribution

Latvija

DT1 in selected NUTS2 in MT
The grey-shaded area denotes the IQR of the EU distribution

Malta

DT1 in selected NUTS2 in NL
The grey-shaded area denotes the IQR of the EU distribution
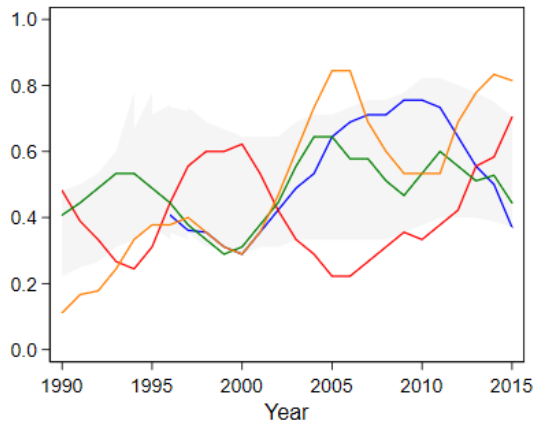
- Amsterdam (RCI)
- Groningen
- Limburg (NL)
- Utrecht

DT1 in selected NUTS2 in PL
The grey-shaded area denotes the IQR of the EU distribution
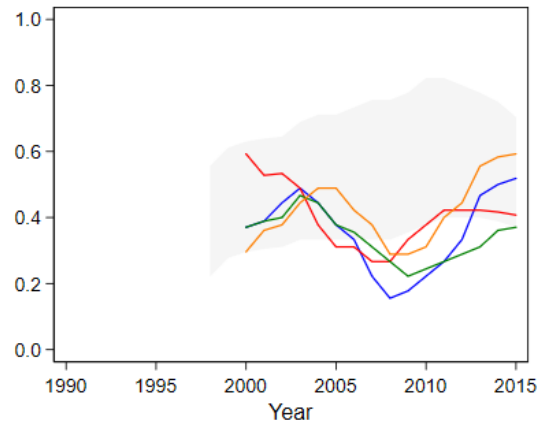
- Dolnoslaskie
- Lódzkie
- Mazowieckie
- Swietokrzyskie

DT1 in selected NUTS2 in PT
The grey-shaded area denotes the IQR of the EU distribution
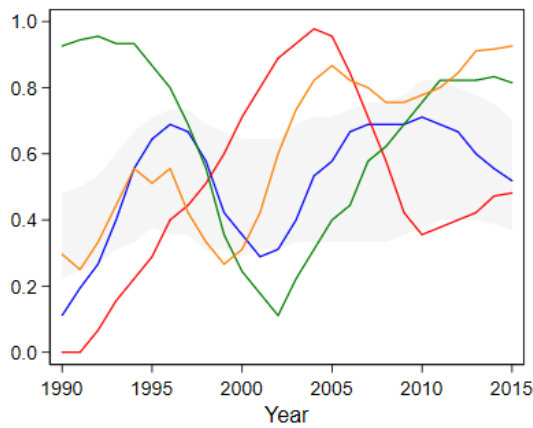
- Algarve
- Norte
- Região Autónoma da Madeira
- Área Metropolitana de Lisboa

DT1 in selected NUTS2 in RO
The grey-shaded area denotes the IQR of the EU distribution
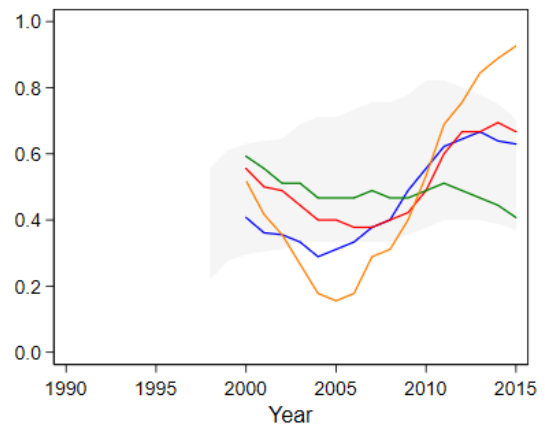
- Centru
- Sud - Muntenia
- Sud-Est
- Vest

DT1 in selected NUTS2 in SE
The grey-shaded area denotes the IQR of the EU distribution

DT1 in selected NUTS2 in SI
The grey-shaded area denotes the IQR of the EU distribution

DT1 in selected NUTS2 in SK
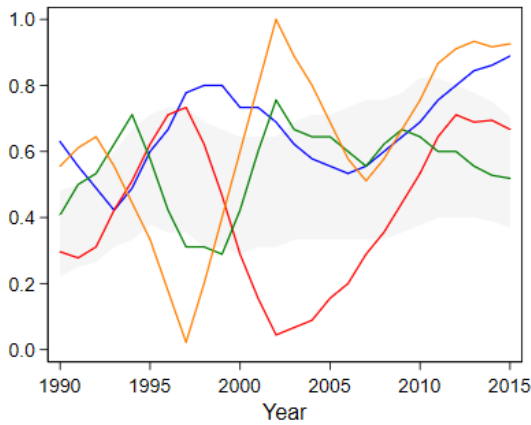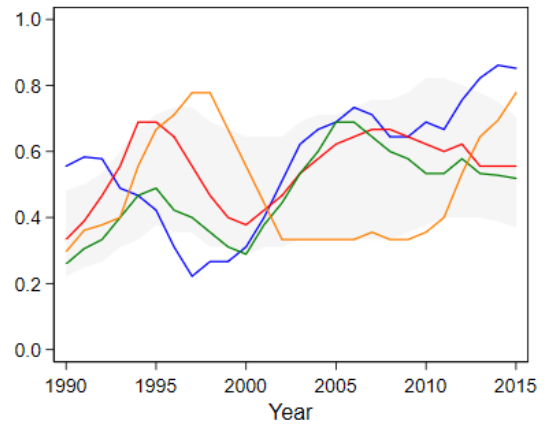The grey-shaded area denotes the IQR of the EU distribution

DT1 in selected NUTS2 in UK
The grey-shaded area denotes the IQR of the EU distribution
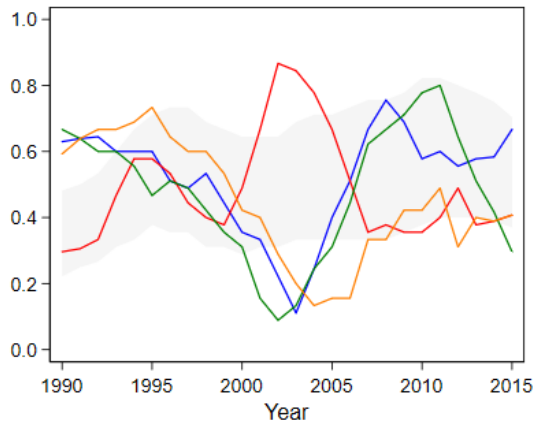
SE legend:
- Mellersta Norrland
- Stockholm
- Västsverige
- Övre Norrland
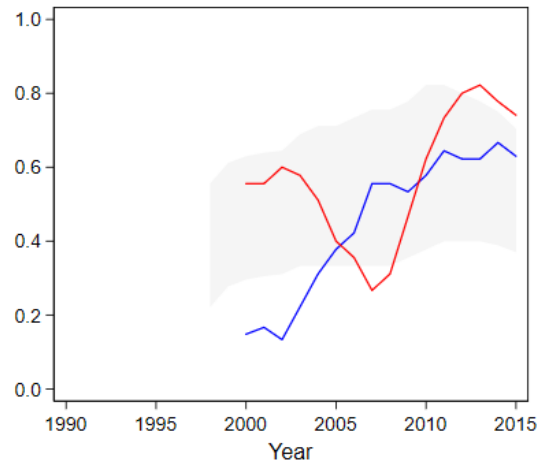
SI legend:
- Vzhodna Slovenija
- Zahodna Slovenija
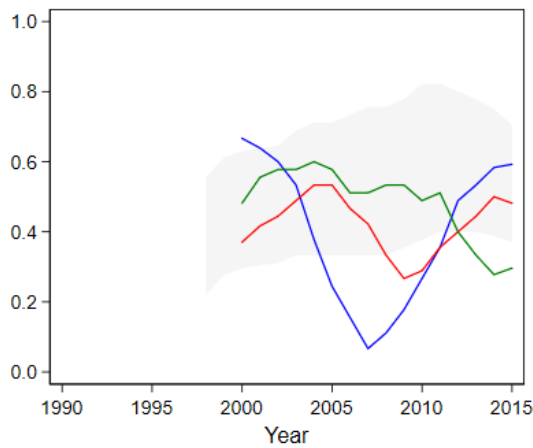
SK legend:
- Bratislavský kraj
- Stredné Slovensko
- Východné Slovensko
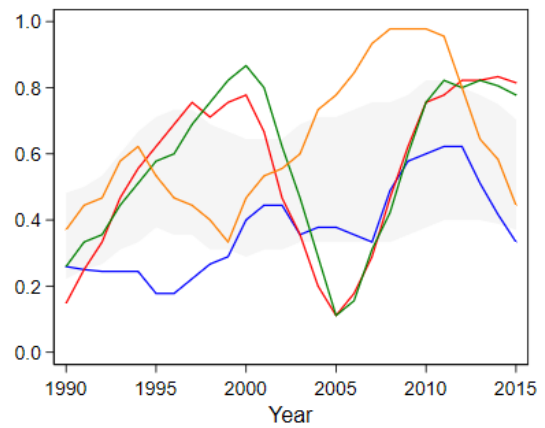
UK legend:
- Cheshire
- East Yorkshire and Northern Lincolnshire
- Tees Valley and Durham
- West Midlands

Figure 57: Predicted average risk of being trapped, by development club

Regional GDP per capita in PPS as a percent of the EU average in each year
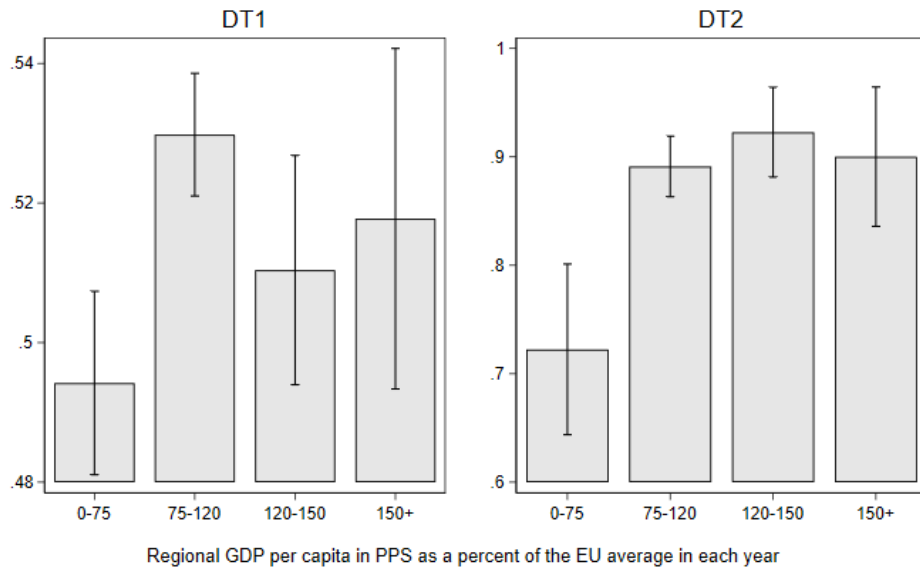
Figure 58: Predicted average risk of being trapped, by lagged GDP/capita relative to EU average

Regional GDP per capita (2005 prices) as a percent of the EU average in each year (lagged by 5 years)
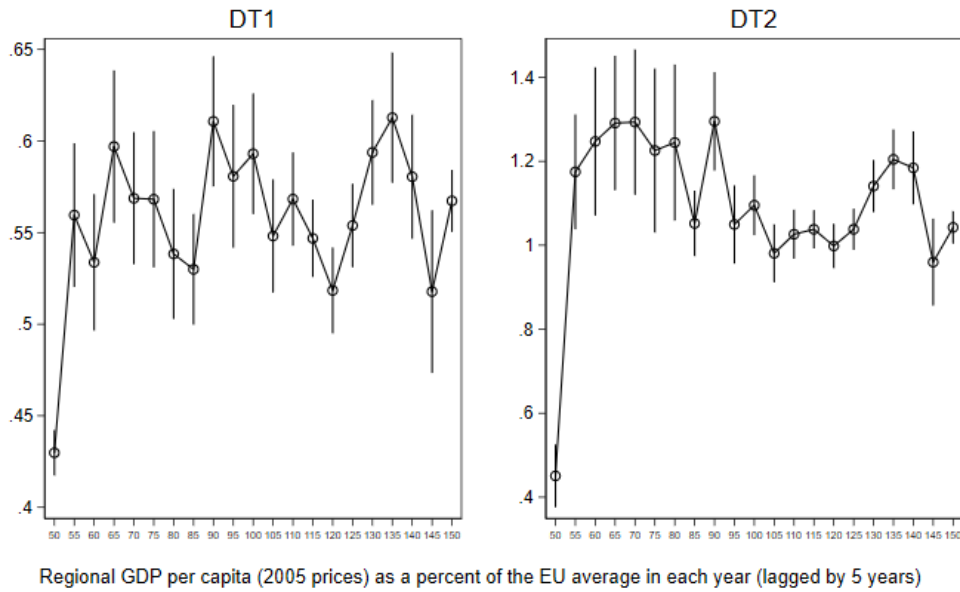
Figure 59: Accelerations/slowdowns and deviations from Italy or the EU

All deviations are expressed in percentage points for ease of reading
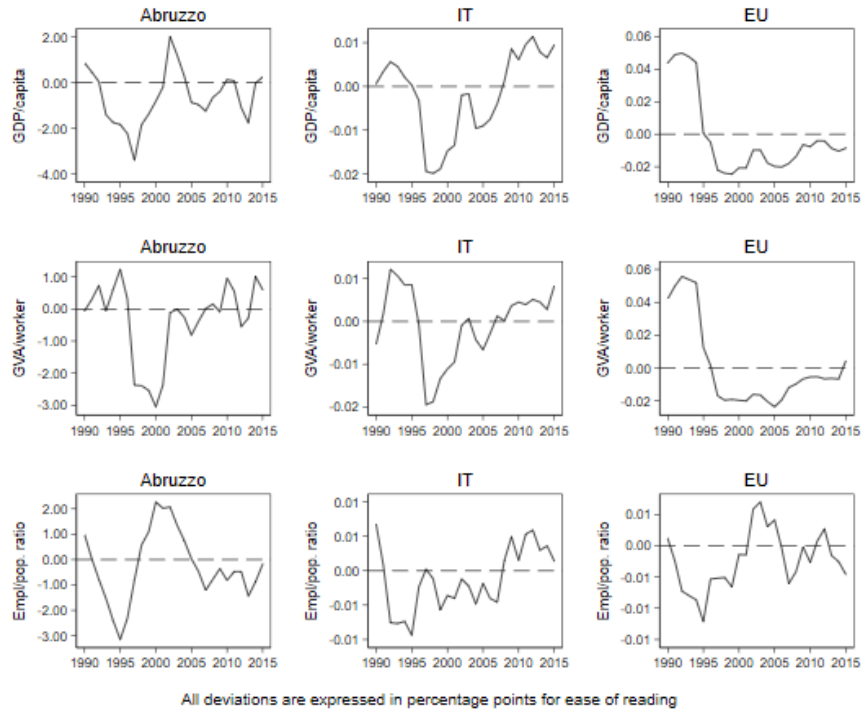
Figure 60: Accelerations/slowdowns and deviations from France or the EU

All deviations are expressed in percentage points for ease of reading
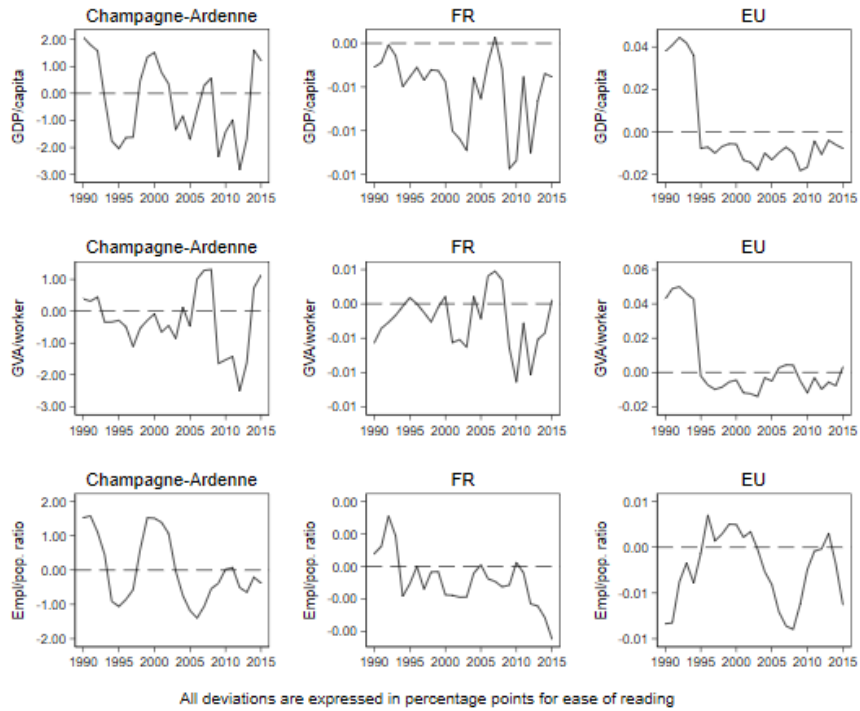
Figure 61: Accelerations/slowdowns and deviations from Croatia or the EU

All deviations are expressed in percentage points for ease of reading
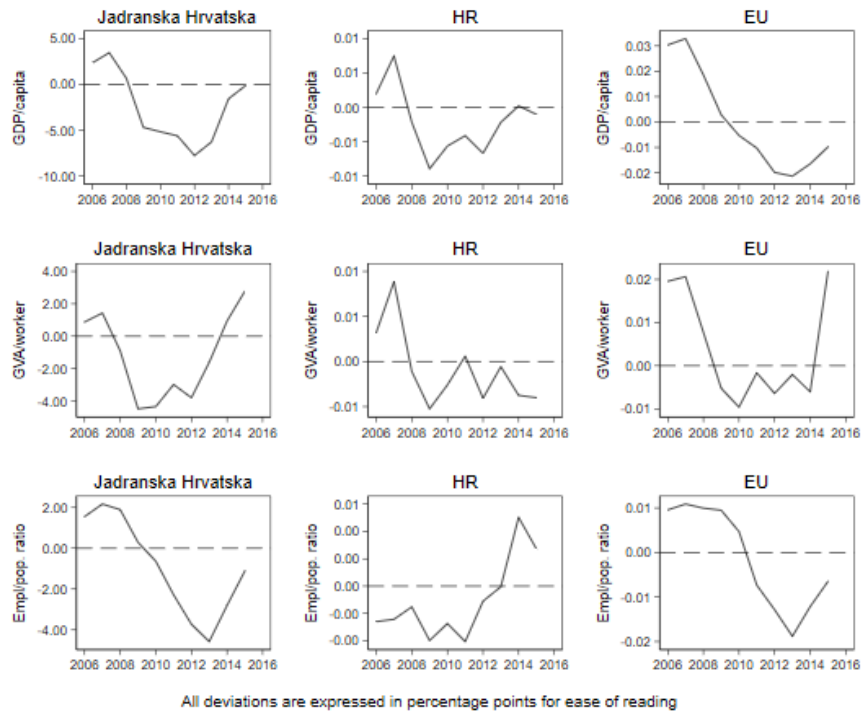
Figure 62: Accelerations/slowdowns and deviations from Sweden or the EU

All deviations are expressed in percentage points for ease of reading
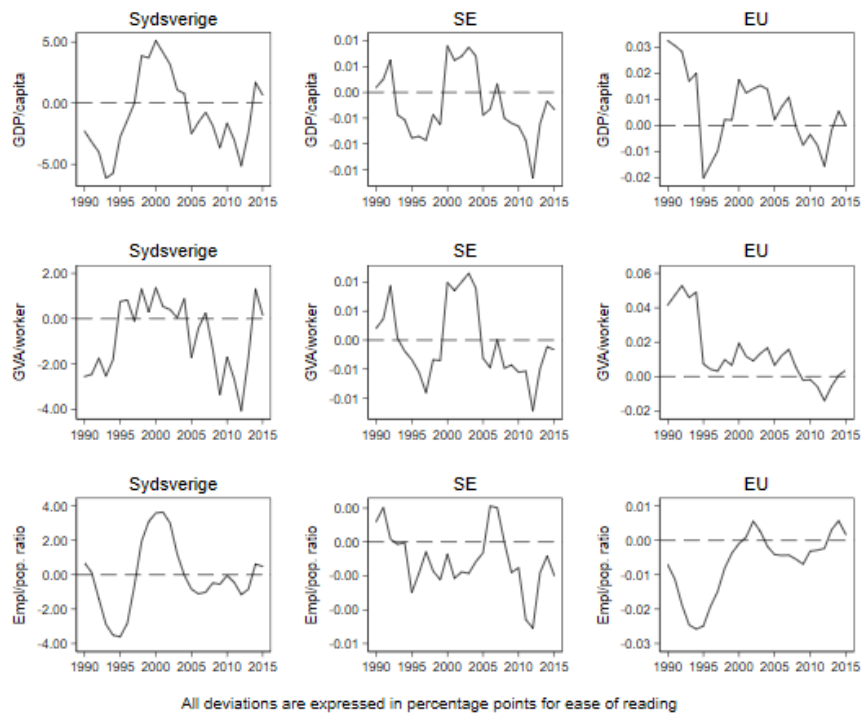
Tables

Table 8: Crosswalk between NUTS2 regions and capital regions combined with commuting belt

Original NUTS2	Name	Combined NUTS2
AT12	Niederösterreich	AT00
AT13	Wien	AT00
BE10	Région de Bruxelles-Capitale	BE00
BE24	Prov. Vlaams-Brabant	BE00
BE31	Prov. Brabant Wallon	BE00
CZ01	Praha	CZ00
CZ02	Střední Čechy	CZ00
DE30	Berlin	DE00
DE40	Brandenburg	DE00
NL23	Flevoland	NL00
NL32	Noord-Holland	NL00
UKH2	Bedfordshire and Hertfordshire	UK00
UKH3	Essex	UK00
UKI3	Inner London — West	UK00
UKI4	Inner London — East	UK00
UKI5	Outer London — East and North East	UK00
UKI6	Outer London — South	UK00
UKI7	Outer London — West and North West	UK00

Table 9: Top 25 ranked regions for average DT1 and DT2 risk over 1990-2015

Rank	NUTS2	Region	MIT1	Rank	NUTS2	Region	MIT2
1	FR22	Picardie	0.73	1	PT20	Região Autónoma dos Açores	1.84
2	DK04	Midtjylland	0.72	2	PT30	Região Autónoma da Madeira	1.82
3	ITI4	Lazio	0.71	3	ES64	Ciudad Autónoma de Melilla	1.49
4	FR21	Champagne-Ardenne	0.71	4	EL51	Anatoliki Makedonia, Thraki	1.46
5	FR63	Limousin	0.70	5	FRA3	Guyane	1.36
6	ITI2	Umbria	0.70	6	EL64	Sterea Ellada	1.35
7	FR42	Alsace	0.69	7	EL42	Notio Aigaio	1.31
8	FR25	Basse-Normandie	0.69	8	EL52	Kentriki Makedonia	1.29
9	FR24	Centre	0.69	9	ES70	Canarias	1.26
10	BE34	Prov. Luxembourg (BE)	0.68	10	EL43	Kriti	1.25
11	ITF4	Puglia	0.68	11	EL61	Thessalia	1.24
12	DK05	Nordjylland	0.68	12	ITF3	Campania	1.23
13	ES64	Ciudad Autónoma de Melilla	0.68	13	ITI4	Lazio	1.23
14	EL51	Anatoliki Makedonia, Thraki	0.67	14	ITF4	Puglia	1.21
15	AT00	Wien (RCI)	0.67	15	ITI2	Umbria	1.21
16	ITF3	Campania	0.67	16	UKF3	Lincolnshire	1.21
17	FR81	Languedoc-Roussillon	0.67	17	ES63	Ciudad Autónoma de Ceuta	1.20
18	FR23	Haute-Normandie	0.66	18	ITF2	Molise	1.20
19	BE00	Bruxelles (RCI)	0.65	19	EL62	Ionia Nisia	1.18
20	BE33	Prov. Liège	0.65	20	ES53	Illes Balears	1.14
21	NL13	Drenthe	0.65	21	UKD4	Lancashire	1.13
22	ITI1	Toscana	0.64	22	SI04	Zahodna Slovenija	1.13
23	ITI3	Marche	0.64	23	ITI3	Marche	1.13
24	ITF2	Molise	0.64	24	UKD1	Cumbria	1.13
25	ITG1	Sicilia	0.64	25	HU23	Dél-Dunántúl	1.12

Table 10: Summary statistics for regression sample and subsamples

Total

Variable	Mean	Std. Dev.	Min.	P50	Max.	Obs.
DT1	0.55	0.26	0	0.56	1	4110
DT2	1.01	0.88	-12	1.05	4.57	4110
ln GDP/head	2.93	0.68	0.51	3.17	5.25	4140
ln Pop.	7.2	0.85	3.25	7.27	9.4	4140
Industry	21.71	8.56	1.51	21.67	60.61	4140
Non Market Serv.	23.08	6.07	11.12	22.48	56.65	4140
Industry	59.81	35.72	3.17	62.49	554.61	4140
Total	1.36	1.11	0	1.05	12.19	3591
Government	0.18	0.2	0	0.1	2.05	3807
Secondary ed. (%)	46.94	15.26	6.9	45	80.3	4035
Tertiary ed. (%)	23.24	8.65	3.6	23.1	69.9	4035
Empl. in S&T (%)	16.64	5.41	4.7	16.3	37.9	4053
Dependency ratio	50.39	5.46	32.8	50.8	87.8	4032
EQI Index	0.21	0.96	-3.18	0.5	2.64	4005

Low income

Variable	Mean	Std. Dev.	Min.	P50	Max.	Obs.
DT1	0.5	0.24	0	0.56	1	988
DT2	0.8	1.24	-12	0.87	4.44	988
ln GDP/head	1.97	0.57	0.51	1.97	3.27	1000
ln Pop.	7.25	0.78	4.4	7.28	9.03	1000
Industry	24.33	9.95	3.23	24.73	48.07	1000
Non Market Serv.	21.49	7.22	11.12	19.05	56.65	1000
Industry	23	15.86	3.17	18.54	92.29	1000
Total	0.56	0.37	0.06	0.46	2.57	919
Government	0.11	0.11	0	0.08	0.86	932
Secondary ed. (%)	55.22	17.91	7.3	61	80.3	939
Tertiary ed. (%)	16.38	6.01	4.3	15.5	42.4	939
Empl. in S&T (%)	11.84	2.87	5.4	11.3	19.9	945
Dependency ratio	47.21	6.11	36.6	46.3	87.8	972
EQI Index	-0.92	0.74	-3.18	-0.83	0.99	946

	Variable	Mean	Std. Dev.	Min.	P50	Max.	Obs.
Middle income	DT1	0.59	0.27	0	0.67	1	1247
	DT2	1.13	0.84	-11.26	1.14	4.57	1247
	ln GDP/head	3.03	0.25	1.84	3.07	3.48	1252
	ln Pop.	7	0.85	4.17	7.18	9.02	1252
	Industry	18.5	7.29	3.16	18.57	45.42	1252
	Non Market Serv.	26.77	6.21	12.15	26.52	54.94	1252
	Industry	63.42	21.21	8.85	64.55	150.75	1252
	Total	1.14	0.82	0	0.94	5.72	1059
	Government	0.16	0.22	0	0.08	1.34	1161
	Secondary ed. (%)	40.51	14.43	6.9	41.3	79.6	1213
	Tertiary ed. (%)	24.33	7.52	3.6	24.9	46.6	1213
	Empl. in S&T (%)	15.27	4.13	4.7	15.1	29.3	1225
	Dependency ratio	52.41	5.04	35.7	53	65.5	1213
	EQI Index	0.36	0.72	-3.04	0.49	1.6	1205

	Variable	Mean	Std. Dev.	Min.	P50	Max.	Obs.
High income	DT1	0.55	0.27	0	0.56	1	1875
	DT2	1.04	0.59	-3.15	1.05	3.88	1875
	ln GDP/head	3.41	0.25	2.34	3.37	5.25	1888
	ln Pop.	7.31	0.87	3.25	7.36	9.4	1888
	Industry	22.44	7.8	1.51	23.15	60.61	1888
	Non Market Serv.	21.43	3.63	12.1	21.4	31.06	1888
	Industry	78.38	36.15	17.05	73	554.61	1888
	Total	1.99	1.21	0.09	1.68	12.19	1613
	Government	0.23	0.22	0	0.16	2.05	1714
	Secondary ed. (%)	46.82	11.73	15	44.9	71.4	1883
	Tertiary ed. (%)	26.2	8.56	7	26.1	69.9	1883
	Empl. in S&T (%)	20.19	4.75	5.8	19.8	37.9	1883
	Dependency ratio	50.8	4.46	32.8	51	64.7	1847
	EQI Index	0.73	0.66	-2.97	0.86	2.64	1854

	Variable	Mean	Std. Dev.	Min.	P50	Max.	Obs.
Pre-2008	DT1	0.52	0.26	0	0.56	1	2454
	DT2	0.84	0.91	-12	0.97	4.57	2454
	ln GDP/head	2.91	0.7	0.51	3.17	5.1	2484
	ln Pop.	7.19	0.86	3.25	7.26	9.37	2484
	Industry	21.9	8.14	2.1	22.11	57.69	2484
	Non Market Serv.	22.53	5.76	11.12	21.93	54.94	2484
	Industry	56.77	31.91	3.17	59.94	424.09	2484
	Total	1.24	1.04	0	0.96	12.19	1987
	Government	0.17	0.19	0	0.1	2.05	2273
	Secondary ed. (%)	46.53	15.87	6.9	44.7	80.3	2411
	Tertiary ed. (%)	21.16	7.99	3.6	21.1	47.6	2411
	Empl. in S&T (%)	15.63	4.95	4.7	15.3	35.7	2411
	Dependency ratio	49.93	5.21	32.8	50.3	66	2389
	EQI Index	0.24	0.96	-3.18	0.55	2.6	2403

	Variable	Mean	Std. Dev.	Min.	P50	Max.	Obs.
Post-2008	DT1	0.59	0.26	0	0.56	1	1656
	DT2	1.24	0.77	-1.95	1.21	4.44	1656
	ln GDP/head	2.96	0.64	0.85	3.17	5.25	1656
	ln Pop.	7.21	0.85	3.31	7.29	9.4	1656
	Industry	21.42	9.14	1.51	20.71	60.61	1656
	Non Market Serv.	23.91	6.42	12.02	23.55	56.65	1656
	Industry	64.38	40.35	5.05	66.09	554.61	1656
	Total	1.5	1.18	0.06	1.22	9.03	1604
	Government	0.18	0.22	0	0.11	1.38	1534
	Secondary ed. (%)	47.55	14.3	10.5	45.7	79.4	1624
	Tertiary ed. (%)	26.32	8.68	8.3	26.2	69.9	1624
	Empl. in S&T (%)	18.13	5.7	6.5	18.1	37.9	1642
	Dependency ratio	51.06	5.74	33.4	51.4	87.8	1643
	EQI Index	0.17	0.97	-2.97	0.42	2.64	1602

Table 11: List and definition of main variables used in the analysis

Variable	Definition	Source
DT1 Index	See Section 3.2.2 for details	Own elaboration
DT2 Index	See Section 3.2.2 for details	Own elaboration
Population	Counts of permanently settled individuals based on region of residence, thousand people	CE ERD
Total employment	All persons engaged in some productive activity, employees or self-employed, based on work location, thousand people	CE ERD
Gross domestic product	Total gross value added plus taxes less subsidies on products, million EUR (2005 prices)	CE ERD
Gross domestic product in PPS	Total gross value added plus taxes less subsidies on products, million PPS (current prices)	CE ERD
Gross value added	Net result of output valued at basic prices less intermediate consumption valued at purchasers' prices, million EUR (2005 prices)	CE ERD
Gross fixed capital formation	Resident producers' acquisitions, less disposals, of fixed assets, million EUR (2005 prices)	CE ERD
Per capita GDP	Gross domestic product divided by population, thousand EUR (2005 prices)	Own elaboration using CE ERD data
Per worker GVA	Gross value added divided by employment, thousand EUR (2005 prices)	Own elaboration using CE ERD data
Employment to population ratio	Total employment divided by population	Own elaboration using CE ERD data
Per worker gross fixed capital formation	Gross fixed capital formation divided by employment, thousand EUR (2005 prices)	Own elaboration using CE ERD data
Total GERD	Intramural expenditure on research and development, all sectors, share of GDP	Eurostat
Business GERD	Intramural expenditure on research and development, business enterprise sector, share of GDP	Eurostat
Government GERD	Intramural expenditure on research and development, government sector, share of GDP	Eurostat
Higher ed. GERD	Intramural expenditure on research and development, higher education sector, share of GDP	Eurostat
Non profit GERD	Intramural expenditure on research and development, private non-profit sector, share of GDP	Eurostat
Empl. in S&T (%)	Persons employed in a science and technology occupation, professionals or technicians and associate professionals, share of population	Eurostat
Primary ed. (%)	Persons attaining less than primary, primary and lower secondary education (levels 0-2), share of population aged 25-64	Eurostat
Secondary ed. (%)	Persons attaining upper secondary and post-secondary non-tertiary education (levels 3-4), share of population aged 25-64	Eurostat
Tertiary ed. (%)	Persons attaining tertiary education (levels 5-8), share of population aged 25-64	Eurostat
Median age	Median age of population	Eurostat
Dependency ratio (total)	Age dependency ratio, population aged 0-14 and 65 and more to population aged 15-64	Eurostat
Dep. ratio (old)	Old dependency ratio, population 65 and over to population 15 to 64 years	Eurostat
Dep. ratio (young)	Young-age dependency ratio, population aged 0-14 to population 15-64 years	Eurostat
Pop. <15 (%)	Proportion of population aged 0-14, share of total	Eurostat
Pop. 15-64 (%)	Proportion of population aged 15-65, share of total	Eurostat

Pop. 25-64 (%)	Proportion of population aged 25-64, share of total	Eurostat
Pop. >65 (%)	Proportion of population aged 65 or older, share of total	Eurostat
Road accessibility	Population accessible by road	Eurostat, DG REGIO
Rural pop. (%)	Share of population in rural grid cells (2011)	Eurostat, DG REGIO
Suburban pop. (%)	Share of population in towns and suburban grid cells, urban clusters (2011)	Eurostat, DG REGIO
Urban pop. (%)	Share of population in urban grid cells, high-density clusters (2011)	Eurostat, DG REGIO
Population density (population/km2)	Population per square kilometer	Eurostat
Patents	Counts of registered patents by NUTS2 region	PATSTAT data kindly shared by Lenzi, C.
Patents/million pop.	Counts of registered patents per million inhabitants	Own elaboration using data by Lenzi, C.
EQI Index	European Quality of Government Index, time series	Charron, N., V. Lapuente & P. Annoni (2019)
EQI Corruption component	European Quality of Government Index, corruption component, time series	Charron, N., V. Lapuente & P. Annoni (2019)
EQI Impartiality component	European Quality of Government Index, impartiality component, time series	Charron, N., V. Lapuente & P. Annoni (2019)
EQI Quality component	European Quality of Government Index, quality compoent, time series	Charron, N., V. Lapuente & P. Annoni (2019)
FDI total deal value	Aggregate value of total incoming foreign direct investment deals, both greenfield and M&A, thousand EUR (2015 prices)	Copenhagen Economics using FT fDi Markets and BvD Zephyr data
FDI total number of projects	Aggregate count of total incoming foreign direct investment projects, both greenfield and M&A	Copenhagen Economics using FT fDi Markets and BvD Zephyr data

Table 12: Baseline pooled OLS regressions using DT2

	(1)	(2)	(3)	(4)	(5)	(6)
ln GDP/head	15.43**	24.27***	21.80***	31.01***	29.25***	36.38***
	(6.778)	(6.954)	(6.640)	(6.816)	(7.198)	(7.109)
ln Population	1.117	0.504	1.202	2.355	2.284	1.895
	(3.244)	(3.101)	(3.141)	(3.106)	(3.180)	(3.004)
Industry (% Empl.)	0.420	0.0298	-0.233	-0.0878	0.0230	-0.106
	(0.488)	(0.497)	(0.647)	(0.592)	(0.512)	(0.484)
Non Fin. Serv. (% Empl.)	2.718***	2.114**	2.504***	2.449***	2.494***	1.919**
	(0.759)	(0.820)	(0.736)	(0.770)	(0.740)	(0.799)
Non Market Serv. (% Empl.)	1.599***	1.469***	1.477***	1.466***	1.490***	1.396***
	(0.481)	(0.475)	(0.505)	(0.499)	(0.481)	(0.469)
Ind. productivity	-0.103	-0.159	-0.119	-0.0912	-0.0893	-0.0894
	(0.0939)	(0.178)	(0.0831)	(0.0958)	(0.0949)	(0.174)
Tot. GERD (% GDP)	-3.880*		-5.086**	-0.385	-0.422	
	(2.098)		(2.067)	(2.398)	(2.360)	
Gov't GERD (% GDP)		-38.92***				-29.46**
		(12.36)				(12.17)
Secondary ed. (%)	-0.533***	-0.364*			-0.0997	0.00267
	(0.191)	(0.201)			(0.201)	(0.212)
Tertiary ed. (%)			-0.0772			
			(0.442)			
Empl. in S&T (%)				-3.239***	-3.046***	-2.657***
				(0.753)	(0.805)	(0.770)
Dependency ratio	2.372***	1.844***	2.446***	1.785***	1.809***	1.401***
	(0.478)	(0.455)	(0.500)	(0.430)	(0.421)	(0.402)
EQI Index	-11.33**	-14.84***	-12.77**	-8.600*	-8.552*	-12.42**
	(4.966)	(5.550)	(5.550)	(4.845)	(4.881)	(5.057)
R2 Adj.	0.2003	0.1873	0.1947	0.2098	0.2098	0.1945
R2	0.2060	0.1927	0.2004	0.2155	0.2156	0.2001
F Test	35.2378	32.8612	29.1822	36.6123	37.0722	33.3096
Obs.	3,382	3,575	3,382	3,382	3,382	3,575

All models absorb year dummies. SEs clustered by hybrid region. Significance: *** $p<0.01$; ** $p<0.05$; * $p<0.1$. Estimation sample restricted to 2001-2015. All explanatory variables are lagged by one year.

Table 13: Pooled OLS regressions over subsamples using DT2

	(1) All	(2) Low	(3) Middle	(4) High	(5) Pre-2008	(6) Post-2008
ln GDP/head	36.38***	34.11	76.48***	46.47***	46.97***	7.592
	(7.109)	(33.05)	(23.52)	(16.03)	(10.67)	(9.887)
ln Population	1.895	14.31	-1.601	2.245	7.641	-5.178*
	(3.004)	(10.57)	(4.096)	(2.677)	(5.480)	(2.862)
Industry (% Empl.)	-0.106	1.364	1.048	-0.729*	0.146	-0.497
	(0.484)	(0.989)	(1.217)	(0.408)	(0.730)	(0.619)
Non Fin. Serv. (% Empl.)	1.919**	5.345**	0.642	0.0310	0.304	3.198***
	(0.799)	(2.169)	(1.649)	(0.497)	(1.259)	(0.773)
Non Market Serv. (% Empl.)	1.396***	3.268***	0.858	1.101**	1.397**	0.699
	(0.469)	(1.111)	(1.133)	(0.481)	(0.678)	(0.538)
Ind. productivity	-0.0894	-0.282	0.0553	-0.456***	-0.150	0.0320
	(0.174)	(1.026)	(0.331)	(0.134)	(0.322)	(0.152)
Gov't GERD (% GDP)	-29.46**	-100.8	-14.17	-21.97***	-52.60**	-15.16
	(12.17)	(119.2)	(10.64)	(7.705)	(24.19)	(11.49)
Secondary ed. (%)	0.00267	1.810***	-0.388	-0.649***	0.223	-0.589***
	(0.212)	(0.567)	(0.295)	(0.163)	(0.308)	(0.215)
Empl. in S&T (%)	-2.657***	-10.05**	-2.894	-0.498	-0.257	-3.268***
	(0.770)	(3.907)	(1.759)	(0.636)	(1.187)	(0.796)
Dependency ratio	1.401***	7.193***	-0.446	0.457	0.884	2.495***
	(0.402)	(1.163)	(0.753)	(0.679)	(0.671)	(0.476)
EQI Index	-12.42**	-6.592	-11.72	-6.295	-4.132	-13.21***
	(5.057)	(7.234)	(8.477)	(5.094)	(8.170)	(4.068)
R2 Adj.	0.1945	0.3481	0.2049	0.1251	0.1196	0.3442
R2	0.2001	0.3669	0.2231	0.1386	0.1281	0.3506
F Test	33.3096	32.2616	6.3377	6.4432	10.7625	19.2109
Obs.	3,575	868	1,094	1,613	1,854	1,721

All models absorb year dummies. SEs clustered by hybrid region. Significance: *** $p<0.01$; ** $p<0.05$; * $p<0.1$. Estimation sample restricted to 2001-2015. All explanatory variables are lagged by one year.

Table 14: Fixed effects regressions using DT2

	(1) All	(2) Long diff.	(3) Low	(4) Middle	(5) High	(6) Pre-2008	(7) Post-2008
Industry (% Empl.)	-3.963 (2.998)	-1.731 (4.655)	-2.789 (4.430)	5.230 (4.609)	-10.79** (4.828)	-3.320 (4.123)	2.423 (4.861)
Non Fin. Serv. (% Empl.)	3.376 (3.998)	6.021 (5.979)	6.360 (6.644)	5.053 (4.509)	-3.762 (3.012)	6.589 (8.683)	-1.190 (4.062)
Non Market Serv. (% Empl.)	8.333** (3.832)	12.35* (6.372)	16.95*** (5.456)	8.136 (6.093)	-1.383 (3.145)	7.642 (8.272)	4.496* (2.595)
Ind. productivity	-1.133*** (0.389)	-0.548 (0.470)	-5.475*** (2.061)	-0.473 (0.549)	-0.407 (0.491)	-0.411 (0.799)	-0.997*** (0.324)
Gov't GERD (% GDP)	-106.1 (71.87)	-173.6 (149.0)	-411.6 (310.4)	96.40 (72.56)	-57.46 (39.79)	-153.8 (145.8)	-45.16 (47.16)
Secondary ed. (%)	-0.482 (0.894)	-1.200 (1.336)	3.733 (2.944)	-3.054*** (1.011)	-2.588** (1.186)	1.140 (1.340)	-1.930* (1.128)
Empl. in S&T (%)	-4.089** (1.794)	-6.876*** (2.543)	-7.944* (4.616)	-0.423 (2.807)	-3.072** (1.464)	2.701 (4.200)	-7.943*** (1.400)
Dependency ratio	-4.040** (2.018)	-3.288 (2.434)	0.847 (5.398)	-9.530*** (3.421)	-5.038** (2.343)	-1.260 (4.126)	-7.896*** (2.121)
EQI Index	-33.29** (13.07)	-67.15*** (16.02)	-4.970 (33.79)	-17.81 (14.48)	-69.78*** (23.80)	-58.95** (27.04)	27.81 (19.13)
R2 Adj.	0.2734	0.1870	0.4568	0.3570	0.2285	0.2910	0.5462
R2	0.3306	0.3708	0.5182	0.4339	0.3064	0.3936	0.6169
F Test	5.6884	6.9222	8.3268	3.6059	4.3533	1.4406	9.1711
Obs.	3,572	1,169	868	1,088	1,606	1,846	1,721

All models absorb region and year dummies. SEs clustered by hybrid region. Significance: *** $p<0.01$; ** $p<0.05$; * $p<0.1$. Estimation sample restricted to 2001-2015. Long diff.: 2001-04-07-10-13. All explanatory variables are lagged by one year.

Table 15: Baseline pooled OLS regressions using DT1 and GVA shares

	(1)	(2)	(3)	(4)	(5)	(6)
ln GDP/head	7.111***	10.15***	7.525***	8.889***	8.445***	10.67***
	(2.043)	(2.007)	(1.888)	(1.934)	(2.252)	(2.242)
ln Population	2.167**	2.069**	2.198**	2.215**	2.222**	2.126**
	(0.938)	(0.890)	(0.976)	(0.960)	(0.954)	(0.896)
Industry (% GVA)	-0.468***	-0.540***	-0.654***	-0.582***	-0.540***	-0.556***
	(0.168)	(0.157)	(0.175)	(0.168)	(0.178)	(0.161)
Non Fin. Serv. (% GVA)	-0.344	-0.449**	-0.448*	-0.404*	-0.381	-0.457**
	(0.224)	(0.202)	(0.232)	(0.229)	(0.232)	(0.205)
Non Market Serv. (% GVA)	0.344*	0.337*	0.282	0.267	0.282	0.317*
	(0.200)	(0.179)	(0.202)	(0.207)	(0.207)	(0.184)
Ind. productivity	-0.0173	-0.0828*	0.00338	-0.00617	-0.00948	-0.0779*
	(0.0262)	(0.0424)	(0.0241)	(0.0249)	(0.0257)	(0.0425)
Tot. GERD (% GDP)	-1.385*		-1.271	-0.910	-0.937	
	(0.822)		(0.845)	(0.890)	(0.884)	
Gov't GERD (% GDP)		-12.30***				-11.83***
		(3.579)				(3.604)
Secondary ed. (%)	-0.0932	-0.0541			-0.0370	-0.0337
	(0.0602)	(0.0582)			(0.0742)	(0.0705)
Tertiary ed. (%)			-0.182			
			(0.130)			
Empl. in S&T (%)				-0.461**	-0.387	-0.142
				(0.192)	(0.237)	(0.229)
Dependency ratio	0.503***	0.350**	0.454***	0.428***	0.439***	0.330**
	(0.155)	(0.152)	(0.161)	(0.160)	(0.162)	(0.155)
EQI Index	-3.895***	-4.445***	-3.574***	-3.413***	-3.433***	-4.279***
	(1.197)	(1.237)	(1.257)	(1.233)	(1.235)	(1.261)
R2 Adj.	0.1631	0.1526	0.1628	0.1645	0.1644	0.1526
R2	0.1690	0.1583	0.1688	0.1704	0.1706	0.1585
F Test	23.2051	22.5236	23.3745	23.5646	21.3498	20.6055
Obs.	3,382	3,575	3,382	3,382	3,382	3,575

All models absorb year dummies. SEs clustered by hybrid region. Significance: *** $p<0.01$; ** $p<0.05$; * $p<0.1$. Estimation sample restricted to 2001-2015. All explanatory variables are lagged by one year.

Table 16: Pooled OLS regressions over subsamples using DT1 and GVA shares

	(1) All	(2) Low	(3) Middle	(4) High	(5) Pre-2008	(6) Post-2008
ln GDP/head	10.67***	18.34***	23.75***	17.78***	10.06***	7.165**
	(2.242)	(3.861)	(8.347)	(6.650)	(3.054)	(3.057)
ln Population	2.126**	3.020**	0.824	1.837	2.380*	2.186*
	(0.896)	(1.383)	(1.926)	(1.396)	(1.311)	(1.140)
Industry (% GVA)	-0.556***	-0.315	-0.462	-0.315	-0.317	-0.565**
	(0.161)	(0.272)	(0.359)	(0.273)	(0.245)	(0.221)
Non Fin. Serv. (% GVA)	-0.457**	-0.427	-0.795*	-0.0289	-0.377	-0.146
	(0.205)	(0.349)	(0.426)	(0.315)	(0.269)	(0.292)
Non Market Serv. (% GVA)	0.317*	0.742**	0.122	0.660	0.165	0.563**
	(0.184)	(0.338)	(0.379)	(0.429)	(0.289)	(0.265)
Ind. productivity	-0.0779*	-0.269*	-0.0618	-0.165***	-0.148**	0.000443
	(0.0425)	(0.145)	(0.0901)	(0.0553)	(0.0639)	(0.0531)
Gov't GERD (% GDP)	-11.83***	-13.32	-10.48	-7.419*	-11.69**	-12.13**
	(3.604)	(10.96)	(7.789)	(4.125)	(5.121)	(4.857)
Secondary ed. (%)	-0.0337	0.350***	-0.121	-0.246**	-0.112	-0.0198
	(0.0705)	(0.104)	(0.126)	(0.113)	(0.0948)	(0.0935)
Empl. in S&T (%)	-0.142	-2.309***	0.127	0.358	0.865***	-0.805***
	(0.229)	(0.565)	(0.457)	(0.308)	(0.323)	(0.310)
Dependency ratio	0.330**	0.643**	0.150	0.495	0.360	0.580***
	(0.155)	(0.252)	(0.317)	(0.306)	(0.225)	(0.184)
EQI Index	-4.279***	-2.246	-7.283***	-5.430**	-2.895	-4.383***
	(1.261)	(1.853)	(2.032)	(2.466)	(1.804)	(1.462)
R2 Adj.	0.1526	0.3237	0.1947	0.1207	0.0825	0.2485
R2	0.1585	0.3432	0.2132	0.1344	0.0914	0.2559
F Test	20.6055	26.2087	3.9564	5.6337	9.9445	16.2815
Obs.	3,575	868	1,094	1,613	1,854	1,721

All models absorb year dummies. SEs clustered by hybrid region. Significance: *** $p<0.01$; ** $p<0.05$; * $p<0.1$. Estimation sample restricted to 2001-2015. All explanatory variables are lagged by one year.

Table 17: Fixed effects regressions using DT1 and GVA shares

	(1) All	(2) Long diff.	(3) Low	(4) Middle	(5) High	(6) Pre-2008	(7) Post-2008
Industry (% GVA)	-1.964***	-2.084***	-1.753*	-0.818	-0.802	-2.658***	-0.753
	(0.456)	(0.665)	(0.888)	(0.909)	(1.051)	(0.797)	(0.817)
Non Fin. Serv. (% GVA)	-2.526***	-2.391***	-1.981***	-1.482	-1.590	-2.068*	-1.415**
	(0.551)	(0.839)	(0.748)	(1.268)	(1.035)	(1.147)	(0.660)
Non Market Serv. (% GVA)	1.749**	1.018	1.442	1.348	3.257**	-0.150	1.106
	(0.770)	(1.002)	(1.239)	(1.332)	(1.596)	(1.463)	(1.050)
Ind. productivity	-0.158	0.0220	-0.821	-0.170	-0.109	-0.296	-0.243
	(0.113)	(0.165)	(0.495)	(0.175)	(0.177)	(0.198)	(0.167)
Gov't GERD (% GDP)	-24.86**	-20.24*	-40.49	28.78	-25.59*	-2.505	-11.25
	(10.29)	(12.05)	(27.52)	(19.43)	(15.20)	(16.08)	(16.16)
Secondary ed. (%)	-0.580**	-1.090***	0.821	-0.988**	-1.341***	-0.815**	-0.339
	(0.270)	(0.399)	(0.499)	(0.484)	(0.406)	(0.367)	(0.432)
Empl. in S&T (%)	-1.272***	-1.414**	-1.845*	-0.417	-1.386**	0.369	-2.601***
	(0.395)	(0.569)	(1.074)	(0.692)	(0.660)	(0.696)	(0.530)
Dependency ratio	-0.965**	-0.873*	0.360	-2.250**	-1.619*	0.506	-3.449***
	(0.431)	(0.487)	(0.870)	(1.042)	(0.844)	(0.786)	(0.832)
EQI Index	-7.116**	-11.87***	10.90*	-7.476	-22.62***	-7.010	3.055
	(3.507)	(4.382)	(6.080)	(5.711)	(5.993)	(5.971)	(5.826)
R2 Adj.	0.2976	0.1937	0.4175	0.3727	0.3078	0.3171	0.5076
R2	0.3529	0.3759	0.4834	0.4477	0.3776	0.4159	0.5843
F Test	14.2750	7.6312	8.6225	3.4268	6.5330	2.9800	7.1590
Obs.	3,572	1,169	868	1,088	1,606	1,846	1,721

All models absorb region and year dummies. SEs clustered by hybrid region. Significance: *** $p<0.01$; ** $p<0.05$; * $p<0.1$. Estimation sample restricted to 2001-2015. Long diff.: 2001-04-07-10-13. All explanatory variables are lagged by one year.

Table 18: Baseline pooled OLS regressions using DT2 and GVA shares

	(1)	(2)	(3)	(4)	(5)	(6)
ln GDP/head	33.83***	39.19***	36.15***	43.82***	46.13***	50.08***
	(7.245)	(6.524)	(6.805)	(5.677)	(6.979)	(6.583)
ln Population	-1.163	-1.845	-1.372	-0.616	-0.652	-0.662
	(3.141)	(3.019)	(3.164)	(3.127)	(3.108)	(2.944)
Industry (% GVA)	-1.095**	-1.275**	-1.448**	-1.541***	-1.758***	-1.611***
	(0.476)	(0.502)	(0.612)	(0.514)	(0.503)	(0.500)
Non Fin. Serv. (% GVA)	-0.814	-1.094	-1.010	-1.040	-1.158	-1.262*
	(0.818)	(0.749)	(0.812)	(0.784)	(0.802)	(0.734)
Non Market Serv. (% GVA)	0.586	0.512	0.541	0.0976	0.0194	0.103
	(0.531)	(0.507)	(0.560)	(0.559)	(0.570)	(0.550)
Ind. productivity	-0.113	-0.166	-0.0892	-0.0584	-0.0411	-0.0625
	(0.0714)	(0.147)	(0.0572)	(0.0610)	(0.0705)	(0.147)
Tot. GERD (% GDP)	-4.501**		-5.199**	-0.508	-0.369	
	(2.174)		(2.249)	(2.469)	(2.426)	
Gov't GERD (% GDP)		-40.53***				-30.61**
		(12.80)				(12.63)
Secondary ed. (%)	-0.325	-0.210			0.193	0.219
	(0.218)	(0.227)			(0.228)	(0.241)
Tertiary ed. (%)			-0.0167			
			(0.481)			
Empl. in S&T (%)				-3.184***	-3.569***	-2.979***
				(0.763)	(0.771)	(0.779)
Dependency ratio	1.274**	0.957**	1.283***	0.737*	0.679	0.533
	(0.494)	(0.464)	(0.485)	(0.410)	(0.417)	(0.405)
EQI Index	-13.03**	-15.52***	-13.82**	-8.877*	-8.770*	-12.03**
	(5.066)	(5.482)	(5.837)	(5.076)	(4.999)	(5.271)
R2 Adj.	0.1929	0.1835	0.1909	0.2052	0.2054	0.1923
R2	0.1986	0.1890	0.1966	0.2108	0.2113	0.1979
F Test	26.7084	27.1540	27.8065	28.0202	25.6432	26.7190
Obs.	3,382	3,575	3,382	3,382	3,382	3,575

All models absorb year dummies. SEs clustered by hybrid region. Significance: *** $p<0.01$; ** $p<0.05$; * $p<0.1$. Estimation sample restricted to 2001-2015. All explanatory variables are lagged by one year.

Table 19: Pooled OLS regressions over subsamples using DT2 and GVA shares

	(1) All	(2) Low	(3) Middle	(4) High	(5) Pre-2008	(6) Post-2008
ln GDP/head	50.08***	65.41**	80.12***	40.35**	49.85***	25.17***
	(6.583)	(28.46)	(25.33)	(16.09)	(9.910)	(8.881)
ln Population	-0.662	6.768	-4.211	2.125	8.359*	-7.992**
	(2.944)	(10.14)	(4.611)	(2.862)	(4.745)	(3.305)
Industry (% GVA)	-1.611***	-1.196	-0.990	-0.830	-0.243	-1.789***
	(0.500)	(1.367)	(0.890)	(0.574)	(0.814)	(0.624)
Non Fin. Serv. (% GVA)	-1.262*	-0.185	-2.044	-0.166	0.0928	-0.579
	(0.734)	(1.731)	(1.408)	(0.832)	(1.107)	(0.928)
Non Market Serv. (% GVA)	0.103	2.602	-0.899	0.979	1.076	-0.225
	(0.550)	(1.584)	(1.096)	(0.828)	(0.858)	(0.748)
Ind. productivity	-0.0625	-0.200	0.0351	-0.310***	-0.0846	0.0429
	(0.147)	(1.166)	(0.287)	(0.117)	(0.254)	(0.140)
Gov't GERD (% GDP)	-30.61**	-80.37	-18.67*	-19.01**	-53.82**	-14.34
	(12.63)	(118.5)	(10.70)	(7.727)	(24.99)	(11.44)
Secondary ed. (%)	0.219	2.468***	-0.227	-0.571***	0.356	-0.430*
	(0.241)	(0.669)	(0.320)	(0.162)	(0.359)	(0.235)
Empl. in S&T (%)	-2.979***	-7.282*	-3.276*	-0.427	-0.130	-3.713***
	(0.779)	(4.360)	(1.744)	(0.618)	(1.190)	(0.864)
Dependency ratio	0.533	5.444***	-1.108	0.540	0.949	1.383**
	(0.405)	(1.059)	(0.775)	(0.644)	(0.679)	(0.559)
EQI Index	-12.03**	-9.200	-12.46	-5.474	-3.322	-14.37***
	(5.271)	(8.387)	(7.976)	(5.534)	(8.404)	(4.322)
R2 Adj.	0.1923	0.3287	0.2073	0.1272	0.1179	0.3263
R2	0.1979	0.3481	0.2254	0.1407	0.1264	0.3329
F Test	26.7190	21.1740	5.2135	6.7518	10.7506	15.3981
Obs.	3,575	868	1,094	1,613	1,854	1,721

All models absorb year dummies. SEs clustered by hybrid region. Significance: *** $p<0.01$; ** $p<0.05$; * $p<0.1$. Estimation sample restricted to 2001-2015. All explanatory variables are lagged by one year.

Table 20: Fixed effects regressions using DT2 and GVA shares

	(1) All	(2) Long diff.	(3) Low	(4) Middle	(5) High	(6) Pre-2008	(7) Post-2008
Industry (% GVA)	-8.765***	-9.393***	-13.05**	1.735	-5.761*	-9.319***	-7.144***
	(1.847)	(2.931)	(5.271)	(3.038)	(3.366)	(2.964)	(2.578)
Non Fin. Serv. (% GVA)	-13.54***	-16.30***	-15.05***	-4.721	-6.856	-9.102*	-12.31***
	(2.875)	(4.281)	(3.531)	(4.334)	(5.204)	(5.085)	(2.462)
Non Market Serv. (% GVA)	-1.162	-5.962	3.984	1.651	2.190	-2.987	-6.248*
	(3.589)	(5.348)	(7.877)	(4.214)	(6.300)	(8.086)	(3.213)
Ind. productivity	-0.204	0.317	-0.975	-0.614	0.162	0.169	-0.499
	(0.449)	(0.617)	(2.672)	(0.591)	(0.540)	(0.738)	(0.498)
Gov't GERD (% GDP)	-119.5*	-190.9	-482.2	99.53	-64.53	-151.5	-80.37*
	(68.13)	(151.0)	(311.1)	(73.00)	(39.25)	(149.5)	(47.53)
Secondary ed. (%)	-0.577	-0.802	4.765	-2.413**	-2.949***	0.544	-1.367
	(0.886)	(1.292)	(2.869)	(1.183)	(1.124)	(1.313)	(1.100)
Empl. in S&T (%)	-3.957**	-7.059***	-3.205	-0.890	-2.916*	1.011	-6.659***
	(1.595)	(2.273)	(4.660)	(2.551)	(1.485)	(3.840)	(1.368)
Dependency ratio	-4.811**	-3.996	-2.395	-9.319**	-4.584**	-1.575	-7.103***
	(2.327)	(2.886)	(6.351)	(3.731)	(2.191)	(4.339)	(2.087)
EQI Index	-34.02**	-63.62***	6.674	-34.66*	-64.95***	-54.09**	26.46
	(13.25)	(17.86)	(26.19)	(18.47)	(22.57)	(21.99)	(18.66)
R2 Adj.	0.2949	0.1932	0.4681	0.3484	0.2405	0.2971	0.5661
R2	0.3503	0.3755	0.5282	0.4263	0.3172	0.3988	0.6337
F Test	11.8760	8.4393	11.1524	2.8045	3.6906	2.6818	12.2263
Obs.	3,572	1,169	868	1,088	1,606	1,846	1,721

All models absorb region and year dummies. SEs clustered by hybrid region. Significance: *** $p<0.01$; ** $p<0.05$; * $p<0.1$. Estimation sample restricted to 2001-2015. Long diff.: 2001-04-07-10-13. All explanatory variables are lagged by one year.

Table 21: List of interview partners in each region

Abruzzo, Italy
• Alberto Bazzucchi, CRESA Economic Research Center, Chamber of Commerce L'Aquila
• Sabrina Ciancone, Mayor of Fontecchio, municipality in the province of L'Aquila
• Valter Di Giacinto, Bank of Italy, L'Aquila Branch, Chief Economist, Analysis and Territorial Economic Research Office
• Roberto Di Vincenzo, CEO of CARSA Edizione spa, CEO of Carsa the thinking company, Pescara, Administrator of Symbola, President Isnart scpa (Istituto Nazionale Ricerche Turistiche), General Secretary of Abruzzo
• Luciano Fratocchi, Full Professor of Management Engineering at the University of L'Aquila.
• Sergio Galbiati, Lfoundry, Avezzano, Vice Chairman and SMIC SVP for European Affairs and President of Abruzzo
• Rita Innocenzi, Secretary's office of CGIL Abruzzo Molise, Pescara
• Giovanni Lolli, Italian politician, interim President and vice-president of Abruzzo until 23 February 2019, responsible for regional development policies
• Alessandra Vittorini, Superintendent Archaeology, Fine Arts and Landscape for the city of L'Aquila and the other municipalities hurt by the earthquake

Adriatic Croatia (Jadranska Hrvatska)
• Ivica Rakušić – deputy mayor of the city of Solin
• Ljudevit Krpan - Head of Department of the regional development, infrastructure and managing projects of the Primorje-Gorski Kotar County
• Vesna Fried - Croatian Chamber of Economy - director of Split County Chamber
• Zvonimir Akrap – Board Member at OTP banka d.d
• Branko Grčić – full professor at Faculty of Economics, Business and Tourism, University of Split, member of Croatian Parlament (ex Minister of regional development and EU funds in Croatia)
• Sanja Blažević – associate professor at Faculty of Economics and Tourism "Dr. Mijo Mirković", University of Pula

Champagne-Ardenne, France
• Sylvie Benoit, maître de conférence at the university of Reims Champagne-Ardenne (URCA) specialised in regional development
• Jean-Paul Hasseler, president of the Chamber of Commerce and Industry for Haute-Marne and Meuse
• Boris Ravignon, Mayor of Charleville-Mézières and president of Ardenne Métropole (communauté d'agglomération de Charleville-Mézières and Sedan)
• Martine Carrieu, Director of Economic Development, Higher Education and Research at Châlons Agglo (communauté d'agglomération de Châlons-en-Champagne)
• Jean-Paul Bachy, former president of Champagne-Ardenne (2004-2015), former Mayor of Sedan (1995-2004), former Member of Parliament (1988-1993), former Member of European Parliament for the Ardennes département (1984-1988)
• Benoist Apparu, Mayor of Châlons-en-Champagne, former Minister of Housing (2009-2012), former Member of Parliament for the Marne département (2012-2017)

Southern Sweden (Sydsverige)
• Anna Råman, Region Skåne, Analyst Regional Development
• Christian Lindell, Region Skåne, Analyst, Regional Development
• Catharina Rosenquist, Region Blekinge, Strategist Regional Growth
• Johan Furemar Miörner, PhD, Lunds University, Economic Geography
• Pernilla Johansson, Swedbank (former Sydsvenska Handelskammaren, an Industry Organisation (Chamber of Commerce)

Table 22: Questionnaire for semi-structured interviews

Topic: Evidence of development traps

1) Based on your knowledge and experience of [REGION], would you agree with the evidence we presented to you regarding the state of the economy? Why or why not?
   a) Discuss economic and output growth, ask for examples (e.g., discussions in the local press, awareness of new business developments, state of local housing markets)
   b) Discuss employment growth, ask for examples (e.g., closures of notable local firms, large layoffs, new firm entry)
   c) Discuss productivity growth, ask for examples (e.g., firm competitiveness, size, managers' sentiment, investments)
2) Would you say that you region is (express agreement/disagreement with the following):
   a) Better off today than five years ago [Y/N]
   b) Better off today than most other regions in this country [Y/N]
   c) Better off today than most other regions in Europe [Y/N]
3) How do you think the economy of [REGION] will look like in five years? In ten?
4) Taking all this into account would you say that [REGION] is in a development trap? Would you say that it is at risk of becoming trapped?
   a) If yes, for how long do you think this has been the case? How likely is [REGION] to escape the development trap in the future?
   b) If not, what is the aggregate evidence missing? What local evidence would you give in support of this claim?
5) How would you say that the development-trapped state of [REGION] is manifesting itself in everyday life in the society of your region? Can you name a few anecdotal stories in support of this?
6) Would you like to add any further comments regarding the overall state of the economy of [REGION]?

Topic: Consistency of local causes with aggregate findings

7) When in the past can you think of [REGION] as not being in a development trap? What made its economy successful at the time?
8) What would you say are the strengths and weaknesses of [REGION] today, in a few words?
9) How would you describe the sectoral structure of [REGION]'s economy? Has this changed over time? What are the key economic actors (main firms, employers) in [REGION]? What role do you think sectoral structure plays in the development-trapped state of your region?
10) How would you describe internationalisation processes in your region? How would you describe the export performance of your region? Is there a presence of multinational firms in [REGION]? If yes, would you say these actors are embedded in the territory? Do they interact with other local economic actors? If no, why do you think that is the case?
11) What role would you say productivity plays in determining the economic strength or weakness of your region? How would you say this has evolved historically? What do you think productivity in [REGION] will look like in the future? What are its main local sources? How would you describe the innovation processes in your region?
12) How would you describe the regional human capital and pool of skills in [REGION]? What role does it play in local economic development?
    a) What are the key actors involved in higher education provision in your region?
    b) How would you rate the quality of the educational institutions in your region, especially at secondary and tertiary level?
    c) How would you describe the quality and intensity of linkages between secondary and tertiary education institutions and local firms or industry?
    d) Does [REGION] attract students from other places in the vicinity? How well can [REGION] retain its talent after graduation?
    e) Would you say that the skillset produced or attracted by your region matches the demand by local firms? Or would you rather say there is a skill mismatch?
13) What role would you say demographic structure plays in determining the economic strength or weakness of your region?
    a) Would you discuss this as a cause or consequence of the economic state of [REGION]?
    b) Do younger cohorts tend to stay into [REGION] to pursue higher education?

c) How would you describe the contribution of people aged 60 or above to the local economy? If retired, would you say their spending sustains local businesses? Are most retired individuals self-sufficient? Do they rely on market-based mechanisms of support, or do they require informal support from friends and family?

14) How would you describe local formal and informal institutions in [REGION]? What role would you say they play in the economic development of your region? Can they be associated to your region being or not being in a development trap?

15) Are there any other factors that we did not mention that you believe contribute to explaining the current state of the economy and society in your region? Can you elaborate?

16) What is (are), in your opinion, the most important factors that may have driven the region into a development trap?

Topic: Policy tools

17) How would you say past policy contributed to the current state of your region's economy? Did it make the region better-off / worse-off today than it would have been in the absence of this policy? Why or why not?

18) What role do you think future policy can play in supporting the economy of [REGION] in clawing its way out of a development trap?
   a) What should be done in order to transform the economy of the region?
   b) What key areas should be prioritised?

19) What would you say are the untapped sources of development in [REGION]?

20) What would you say are frequent misconceptions and erroneous beliefs about [REGION]?

21) This is the end of the interview. Is there anything at all you would like to add or comment on regarding this interview?

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