Promoting Growth in All Regions

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Foreword

Many governments are searching for new ways to unlock the growth potential of their economies. This has focused attention on why some cities and regions grow faster than others, and what public policies can do to maximise the performance of all types of regions, for the benefit of national economies.

To make good policy choices, we need to better understand regional competitiveness and how regional policies contribute to structural economic policies at the national level. The OECD Territorial Development Policy Committee is a unique international forum for this debate, drawing on innovative statistical work to understand the key challenges of urban and rural regions.

This publication provides evidence on how to design regional development policies that promote growth in all types of regions.

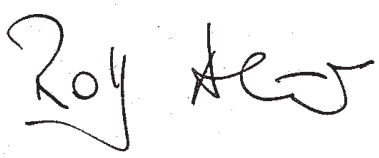
We look first at the link between regional performance and aggregate growth. Contrary to received wisdom, we can demonstrate that strong growth is possible and even common in less densely populated areas and that regions outside main urban hubs may generate a significant share of national wealth.

We then ask how less-developed regions can harness their potential to catch up to the national average GDP *per capita.* We identify the main growth drivers and bottlenecks for regions at different stages of development, both for regions that have successfully converged with national averages and for those that continue to lag behind their peers. Through 23 regional case studies over roughly three business cycles, we highlight the policies and development strategies that regions have successfully employed in order to turn their economic fortunes around.

Based on this evidence, we present specific policy recommendations upon which regional and national policy makers can act. The report concludes that policy makers are right to pay attention to the performance of big regional hubs, including large urban areas, as drivers for growth. However, mobilising the growth potential of less developed regions makes good economic sense. Increasing skills should be a key element of integrated growth strategies at regional level. Innovation and infrastructure require careful region-specific analysis to assess their impact of mobilising potential growth. Institutional factors are also crucial in ensuring successful consultation and co-ordination among stakeholders within regions, with other regions and central government.

It is the unique combination of regional data across the OECD, the quality of analysis, and the evidence from a range of regional case studies that allows the powerful set of policy recommendations to emerge. We are pleased to make again the case for place-based policies and to enrich the structural adjustment agenda by adding the regional dimension.

Rolf Alter



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Acronyms and abbreviations

BERD	Business R&D expenditure
CRS	Constant returns to scale
CUB	*Communauté urbaine de Bordeaux*
CUP	Catching-up potential
EMU	European Monetary Union
ESF	European Social Fund
EU	European Union
FDI	Foreign direct investment
GDP	Gross domestic product
GERD	Government R&D expenditure
GM	Greater Manchester
GVA	Gross value added
HED	Higher education
HEI	Higher education institutions
ICT	Information and communications technology
IN	Intermediate
INC	Intermediate close to a city
INR	Intermediate remote region
IRS	Increasing returns to scale
IT	Information technology
KBI	Knowledge-based industry
LCR	Leeds city region
LCUP	Large catching-up potential
LEP	Local Enterprise Partnerships
LF	Labour force
MiPi	Midi-Pyrénées
MLG	Multi-level governance
NAFTA	North American Free Trade Agreement
NGO	Non-governmental organisation
NVQ	National Vocational Qualification
OECD	Organisation for Economic Co-operation and Development

OLS	Ordinary least square
Pc	*per capita*
PIA	*Programme d'Investissements d'Avenir*
PISA	Programme for International Student Assessment
Pp	Percentage points
PPP	Purchasing power parity
PR	Predominantly rural
PRC	Predominantly rural close to a city
PRR	Predominantly rural remote
PU	Predominantly urban
Q	Quadrant
R&D	Research and development
RDA	Regional Development Authority
SME	Small and medium enterprise
TL2	Territorial level 2
TL3	Territorial level 3
TWCR	Tyne and Wear city region
WA	Working age

Executive summary

Why should governments invest in underdeveloped regions rather than just focusing only on a few main engines of growth? Do such regions have anything to offer to the rest of the country?

At first glance, the answers to these questions might seem to be "they shouldn't" and "no". Very underdeveloped regions can often impose high costs on national budgets. For example, regions characterised by high and rising elderly and jobless dependency ratios may see their young and highly skilled workers leave in search of opportunities elsewhere. Such regions can develop a dependency culture – waiting for support from the national level – rather than exploiting their own resources.

There has also been a tendency to argue, or to just assume, that there is really no growth potential in underdeveloped regions. For these reasons, less developed regions are often seen as a drag on national performance, rather than as potential assets. Policies aimed at supporting them have traditionally sought to "prop them up" through fiscal transfers and subsidies.

This report provides a fresh analysis and shows that this simplistic view is simply not correct. Indeed, it actually leaves untapped significant potential for growth. It offers evidence that will help policy makers to rethink the objectives and instruments of regional development and will improve its impact on national economic and social well-being.

This report draws on a combination of statistical analysis and 23 case studies of specific regions across the OECD area, for the period 1995 to 2007. Our results may surprise those whose attention remains fixed exclusively on big hubs. We found that:

- Less developed regions do and can make a vital contribution to national growth.
- Predominantly rural regions have, on average, enjoyed faster growth than intermediate or predominantly urban regions.
- Broader-based, inclusive growth brings benefits to countries in terms of equity, resilience and fiscal health.
- The barriers to growth that regions must overcome vary widely – more than a "one size fits all" is needed.
- Human capital is a robust determinant of regional growth.
- Policy packages are more important than individual policy measures.
- Policy synergies and co-ordination across related domains can make a real difference.

The point of departure for this publication is the fact that regional growth patterns are not geographically uniform. Indeed, economic activity tends to concentrate in large metropolitan cities. Often, these cities are considered as the engines of national growth. There is generally a lack of understanding of the growth potential that can exist in regions outside of the main cities and the relevance for aggregate performance.

This report aims to remedy that, documenting the economic rationale for promoting growth in all regions, rural or urban or somewhere in between. Our analysis points to a number of policy conclusions:

- **Investing in less-developed regions makes good economic sense**, given their growth potential, and such investment should not be seen merely as social support. These regions have a great deal to contribute to national growth as long as their own assets are nurtured.
- **A pro-growth, rather than a subsidy-based policy stance, is the most beneficial and sustainable approach.** In the long run, it also helps build a fairer society. It can prevent dependency, rent-seeking behaviour and high remedial costs in the future.
- **Policies that increase the skills of low-skilled workers are critical.** Programmes and actions that reduce the proportion of low-skilled workers may be as important for growth as policies aimed at expanding higher education.
- **Polices targeting infrastructure are not usually the most effective tools for strengthening growth in underdeveloped regions,** as infrastructure does not appear to be the binding constraint for the great majority of regions. Yet given that the gains from improvements in infrastructure are higher (at the margin) in underdeveloped regions than in advanced ones, infrastructure packages can be important instruments if they are co-ordinated with other policies.
- **How policy makers frame the challenges they face does matter.** The case studies suggest that a self-conscious shift towards a growth-oriented policy framework is very often a part of the recipe for success. As long as policy makers focus on exogenous sources of support for a region, growth is unlikely to take off and actors are likely to focus on the appropriation of funds from external sources.
- **Institutional factors are also critical.** Formal and informal institutions that facilitate negotiation and dialogue among key actors in order to mobilise and integrate them into the development process are vital, as are those that enhance policy continuity. At times, the challenge is to create institutions that strengthen the region's "voice" in dealing with other regions and countries and those that foster linkages among the private, public and education sectors.

Promoting growth in all regions is economically justified and this study calls for including geography and place-based factors into the structural policy agenda to increase the growth potential of countries. Beyond the economic rationale however, there is a social one. Helping lagging regions to catch up not only benefits the national economy, but also contributes to a more inclusive and sustainable growth model. It helps to build a fairer society, in which no territories, and people living in them, are left behind.

Box 0.1. **Regional terminology**

What do we mean by "region"?

In this publication, "region" is used to mean **a sub-unit within a country**, rather than supra-national groupings of countries.

How does the OECD classify regions within each member country?

Its classification is based on two territorial levels.

The higher level (Territorial level 2 or TL2) consists of 362 large regions. This type of region represents the first administrative tier of sub-national government. For example, the Ontario region in Canada.

The lower level (Territorial level 3 or TL3) is composed of 1 794 small regions. All the regions lie within national borders and in most cases correspond to administrative regions. Each TL3 region is contained within a TL2 region. For example, the TL2 region of Aquitaine in France encompasses five TL3 regions: Dordogne, Gironde, Landes, Lot-et-Garonne and Pyrénées-Atlantiques.

In this publication, our analysis further divides TL3 regions into five categories:

- Predominantly urban region (PU)
- Intermediate region close to a city (INC)
- Intermediate remote region (INR)
- Predominantly rural region close to a city (PRC)
- Predominantly rural remote region (PRR)

These categories were established based on population size and driving distance to the nearest urban area. For more information, see Chapter 1 and Annex 1.A1 of this publication.

What terms are used when classifying TL2 regions by potential?

The study benchmarks the performance of OECD TL2 regions against national performance. We divide the regions into three groups, based on levels of GDP *per capita* at the start of the period under study (1995).

- **Regions with a large catching-up potential (LCUP)** are those with *per capita* GDP at or below 75% of the national average that year.
- **Regions with catching-up potential (CUP)** are those in between, that is, those between 75 and 100% of the national average level of GDP *per capita*.
- **Advanced regions** are those with above-average levels of GDP *per capita*.

Each of these three groups is then split into two sub-groups, based on growth performance over the period in question – those that were losing ground (growth below the national average) and those that were growing at the national average rate or better. For more information, see Chapter 1.

Introduction

Regional growth patterns are not geographically uniform. Indeed, economic activity tends to concentrate in large metropolitan cities. Often, these cities are considered as the engines of national growth. There is a general lack of understanding of the growth potential that can exist in regions outside of main cities and its relevance for aggregate performance.

This report calls for a new and different approach to regional development. Using both statistical analysis and a set of 23 case studies of OECD regions, it argues that relatively underdeveloped regions can in fact potentially be important sources of growth.

Key findings

- Less developed regions make a vital contribution to national growth. During 1995-2007, such regions accounted for 43% of aggregate OECD growth.
- Predominantly rural regions have, on average, enjoyed faster growth than intermediate or predominantly urban regions. Concentration (of population or economic activity) is neither necessary nor sufficient for success.
- Broader-based inclusive growth brings other benefits to countries in terms of equity, resilience and fiscal health.
- The barriers to growth that regions must overcome vary widely. Successful performance therefore requires more than "one size fits all" economy-wide policies: a place-based approach is sometimes needed.
- For all types of regions, human capital appears to be critical, though its relative importance varies according to the level of development. Overall, reducing the proportion of people in a region with very low skills seems to matter more than increasing the share with very high skill levels.
- It is important to think in terms of policy packages rather than individual measures, because individual policy interventions can have unintended and undesirable effects if undertaken in isolation.
- Policy synergies are critical. Those poorer regions that are successfully converging towards national average income levels have adopted strategies to improve policy settings in a number of related domains in a co-ordinated way.

Regional growth patterns are not uniform.

Whether for individual countries, the OECD area or the entire world economy, a handful of regions (the big "hubs") account for a disproportionate share of aggregate growth: typically, around 4% of regions generate about one-third of total growth of

countries. The rest collectively account for the bulk of growth but do not contribute much individually.

This skewed distribution means that:

- Policy makers are right to be concerned about the performance of the big regional hubs. These are major drivers of growth. If they falter, the impact on aggregate performance will be significant.
- Nevertheless, the largest part of aggregate growth occurs outside the hubs. An exclusive focus on the big hubs neglects the potential impact of policies to help the other regions improve their growth performance.
- Although the drivers of growth are mainly large urban areas, there are many large cities that make little or no contribution to aggregate growth. Generating stronger growth in such places could have a palpable impact on national performance.

While the first of these conclusions is widely accepted, it is the second that forms the point of departure for this report. When policy makers focus only on the leading regions, they miss a crucial opportunity to improve aggregate performance. Policy action for non-core areas is not merely a compensatory social policy, it is – or can be – a growth-promoting element of a structural policy package.

Strong growth is possible in all types of regions.

An analysis of regional growth performance over the period 1995-2007 produces some results that will surprise those whose have not looked beyond the big hubs:

- **Less developed regions make a vital contribution to national growth**. Regions with average GDP *per capita* below the national average accounted for 43% of aggregate growth across the OECD during the period in question. In ten OECD countries, such regions accounted for over half of national growth.
- **Across the OECD area, predominantly rural regions have, on average, enjoyed faster growth than intermediate or urban regions**. The widespread view that rural is synonymous with decline is not supported by the facts. Over the period 1995-2007, predominantly rural regions on average have outperformed predominantly urban and intermediate regions.
- **Predominantly rural regions, however, are also characterised by greater variety in performance**. Predominantly rural regions are disproportionately represented among both the best and worst performers in terms of growth. Overall, they exhibit greater variation in performance, suggesting that rural development does pose specific challenges. If these challenges are overcome, rural regions can flourish; if not, they may fall behind rapidly. This wide variation can be driven by a number of factors – global commodity prices and agricultural support policies, technological advances, rise in green tourism, etc. The variation in growth performance can be seen in both remote rural regions and in those close to major cities.

Broader-based growth offers economic and social benefits.

A broader-based growth pattern that includes promoting growth in all regions can also generate benefits in terms of national resilience, equity, and fiscal health:

- **Promoting growth in all regions is likely to render economies less vulnerable to external shocks.** Broader-based growth is likely, other things being equal, to be associated with greater diversity of activity and thus lower risk of asymmetric shocks.
- **"Catch-up" growth in poorer regions reduces the likelihood of individuals' economic opportunities being seriously damaged by where they happen to be born or where they live**. People and firms are mobile and there is no point attempting to freeze production or settlement patterns in place. Neither, however, should policy makers neglect the fact that large inter-regional disparities do raise issues in terms of equity of access to services and access to economic opportunity.
- **Chronically under-performing regions can impose substantial costs on national budgets in a number of ways.** First, and most obviously, missed growth opportunities go hand in hand with lower tax revenues. Second, ensuring adequate public service provision in declining areas can become increasingly expensive. Finally, if the decline is not reversed, political pressure may well lead to expensive policies aimed at sustaining communities and maintaining living standards in such places. Over time, this can lead to conflict, as richer regions grow tired of paying for such support.

Statistical and econometric analysis points to important findings on how to achieve growth.

Analysis of the characteristics of fast and slow growth and higher- and lower-income regions suggests the following broad conclusions:

- **The key drivers of growth do indeed vary according to a region's level of development**, although some factors – education and training, above all – appear to be critical for all types of regions. This reinforces the case for regional development policies that are differentiated in such a way as to address the different constraints that may bind regions at different stages of development.
- **The proportion of the low-skilled workforce appears to have a greater impact on growth than the proportion with tertiary qualifications.** The "drag" on growth of a large population of very low-skilled workers can be very great. Policies to address the plight of the low skilled may thus be as important for growth as policies aimed at expanding higher education. The regional dimension is critical here, since low-to-medium skilled workers tend to be less mobile than their highly skilled counterparts. Markets for highly skilled labour may be national or even global, but both supply and demand further down the skill ladder tend to be regional or local. Policies aimed at addressing skill gaps need to be well adapted to local conditions.

- **The mixed results for infrastructure, which does not appear to be the binding constraint for the great majority of regions, suggest there is a need to revise development strategies** that view infrastructure investments as the pre-eminent tool for regional development. In some instances, such investment may be better used for other purposes. Where infrastructure deficits do need to be addressed, it is important to tackle them in conjunction with other policies so as to ensure that the full benefits are realised.
- **Innovation is shown to be important for regions with higher levels of development, but is less significant in explaining growth in other regions.** Both public and private R&D expenditure as well as patenting activity are very highly concentrated in a small number of leading regions: those closer to the productive frontier. Regions outside these high-technology cores tend to depend on less R&D-intensive (and less easy–to-measure) forms of innovation and on technology transfer, which probably explains why innovation does not stand out as a growth factor in those regions.

Evidence from the case studies sheds light on the importance of policies and institutions.

Our quantitative analysis is complemented by a series of case studies of specific regions, both dynamic and lagging. These standardised studies confirm many of the results of the statistical studies, while also underlining the importance of public policies and strong local development strategies. The case studies applied the following methodology:

- A standardised questionnaire was sent to each of the 23 participating regions.
- Field interviews structured around the questionnaire responses were carried out in each region. The interviews targeted a representative sample of key stakeholders from the private sector, the academic community, NGOs, and regional and (some) national policy makers.
- The case studies were approved by regional or national counterparts and thereafter by the OECD Territorial Development Policy Committee.

This methodology allowed us to document 90 factors for economic growth and 95 bottlenecks to growth observed among the 23 regions. We then distilled these into 18 broader thematic areas. This allowed us to assess the importance of each area. We paid special attention to policies and institutional factors; indeed, such factors proved quite important. Among dynamic regions, policies and institutional factors appear as two of the top three most recurrent growth factors, while among underperforming regions they appear as two of the top three most prevalent bottlenecks. This suggests that in addition to human capital, infrastructure and innovation, the role of policies and institutional factors is as important.

In dynamic regions, the most important factors for growth (in order of frequency) are as follows:

- **Factors related to policy** appear to be critical to growth in dynamic regions. Important policy objectives include: *i*) adopting the new regional paradigm which shifts from a focus on subsidies towards building endogenous growth potential; *ii*) implementing policies that improve linkages (among firms and universities, and across borders); and *iii*) implementing policies targeting urban regeneration.

- **Infrastructure and connectivity** appear to be critical factors for growth in these dynamic regions. These include investments in internal transport infrastructure, connecting relatively closed and isolated regions to external markets, and ensuring that transport infrastructure capitalises on privileged geographic positions.
- **Institutional factors** such as governance, leadership, capacity, continuity and mobilisation, were also important. These factors include using negotiation and dialogue as important tools for mobilising key actors, fostering institutional arrangements that support economic development, giving regional actors a common voice and strong position, and an active role to key local public and private actors focusing on innovation and workforce development/retention.
- **Improving human capital** − including strengthening tertiary education and technical skills, matching human capital to market needs and offering vocational training – are also effective.
- **Innovation** can be promoted through strong open innovation supply chains, encouraging entrepreneurial activities and innovation clusters.

The most common bottlenecks for growth in the underperforming regions by order of frequency amongst the case studies are:

- **Institutional bottlenecks** such as poor mobilisation of stakeholders, lack of continuity and coherence in the implementation of policies by institutions, institutional instability, lack of a common and strategic vision, and lack of capacity and gaps in multi-level governance (MLG) frameworks.
- **The policy paradigm** appears to be a frequent bottleneck, especially the inability to shift the focus of policies away from subsidies towards policies aimed at mobilising regions' own resources and assets. Further bottlenecks result from inefficiencies in implementing selected polices, insufficient links among institutions, and slow reactions to external shocks.
- **Internal fragmentation and labour-market mismatch** are important bottlenecks in converging regions, including low participation of women in the workforce, a mismatch of skills between demand and supply, a fragmented labour market due to poor connectivity, insufficient critical mass to generate agglomeration and spillover effects due to fragmented internal markets, fragmented economic activities and insufficient strong internal connections.
- In terms of **human capital,** the most important bottlenecks are an insufficient stock of human capital, lack of skills and brain drain.

What does this mean for policy?

The case studies demonstrate the importance of an integrated approach to policy and how different strands of policy can complement – or undercut – each other. This reinforces the OECD's paradigm for regional policies, which promotes integrated, co-ordinated and tailored investments to make the most of regions' own resources and assets. For less developed and intermediate regions on a convergence trajectory catching up to national standards, for example, the most common formula for success appeared to be a simultaneous improvement in policies, infrastructure provision and human capital development. This suggests that there may be strong synergies among these critical

pillars. Thus, it is important to think in **terms of policy packages rather than piece-meal measures**.

In around one-third of the sample, a simultaneous improvement in infrastructure, the business environment (particularly when linked to regulatory reform) and "geographic factors" is observed. The last of these, of course, is exogenous, although it serves as a reminder that, in an economic sense, a region's "location" may improve (or deteriorate) as a result of developments like the formation of NAFTA or the enlargement of the EU. Such events can improve or reduce a region's access to major markets independently of any changes in connective infrastructure or travel time/costs. Thus, regions enjoying an improvement in their "geographic" conditions were able to reap the benefits of their location by simultaneously improving infrastructure and the business environment.

This also serves as a reminder that, while many of the key growth drivers are native to regions, not all of them are. Skills in adapting to changes in the external environment can be a great asset in itself, and a lack of adaptive capacity has been identified in several of the case studies as a significant bottleneck.

Bottlenecks tend to occur simultaneously, or in other words they can also come in packages, but these are less clear cut. The study found concurrent problems with policy frameworks, infrastructure provision and connectivity in three regions. Three others were characterised by inadequate institutions and labour market fragmentation, which might suggest a link between the two. Moreover, the quality of institutions emerged as a key factor in both the success and under-performance of regions – institutional bottlenecks were identified in nine case studies and improvements to institutions cited as factors supporting growth in eight others. Thus, governance matters.

Benefits of the new OECD regional paradigm

The evidence gathered in this publication confirms the benefits of the new regional paradigm to OECD member countries:

- Investing in less-developed regions makes good economic sense, given their growth potential. **Policies targeted at less developed regions should not merely be advocated on social grounds;** these regions have a great deal to contribute to national growth as long as their own assets are nurtured.
- A pro-growth, rather than a subsidy-based policy stance, is the most beneficial and sustainable approach. In the long run, it also helps build a fairer society. It can avoid dependency, rent-seeking behaviour and high remedial costs in the future.

The combined analysis points to a number of policy leavers to enhance the effectiveness of regional policy:

- **Policies that increase the skills of low-skilled workers** may be as important for growth as policies aimed at expanding higher education. The "drag" effect on growth of a large low-skilled population appears as one of the most critical factors in less developed regions.
- **Infrastructure** does not appear to be the binding constraint for the great majority of regions. Thus polices targeting infrastructure are not usually the most effective tools for strengthening growth in underdeveloped regions. Yet given that the gains from improvements in infrastructure are higher (at the margin) in

underdeveloped regions than in advanced ones, infrastructure packages can be important instruments if they co-ordinate with other policies.

- **Innovation** is not a bottleneck for growth but appears to be a critical pillar for advanced regions.
- **How policy makers frame the challenges they face does matter.** The case studies suggest that a self-conscious shift towards a growth-oriented policy framework is very often a part of the recipe for success. As long as policy makers focus on exogenous sources of support for a region ("levelling up" policies), growth is unlikely to take off and actors are likely to focus on the appropriation of rents from external sources.
- **Institutional factors** are also critical. Formal and informal institutions that facilitate negotiation and dialogue among key actors in order to mobilise and integrate them into the development process are vital, as are those that enhance policy continuity. At times, the challenge is to create institutions that strengthen the region's "voice" in dealing with other regions and countries and those that foster linkages among the private, public and education sectors.

In sum, this study calls for including geography and place-based factors into the structural policy agenda to increase the growth potential of countries.

In addition to the efficiency place-based policies also have the capacity to create a more inclusive and fairer society through their ability to mobilise local actors and ensure they are involved and engaged in the development process.

Chapter 1

Regional growth trends: Implications for national growth

This chapter categorises OECD regions in different ways to understand the rate at which they are growing and what factors are behind these growth trends. There is strong potential for growth in rural and intermediate regions, particularly in regions with levels of GDP per capita *below the national average. Less developed regions contributed to almost half of the OECD's aggregate growth (43%) between 1995 and 2007. Moreover, in ten OECD countries (Austria, Belgium, Czech Republic, France, Norway, Portugal, the Slovak Republic, Sweden, United Kingdom and the United States) these regions have contributed more to national growth than those countries' advanced regions. These results reveal the importance of catching-up regions for aggregate performance and suggest that policies targeting these types of regions need not merely be social; rather they should be well designed economic policies in line with the new regional paradigm.*

Introduction

Each OECD country is made up of regions that differ vastly in their performance and growth rate. As a response to these market forces, national governments during the 1950s and 1960s used regional policies as an instrument for compensating lagging parts of the country. These usually consisted of massive subsidy interventions (for infrastructure and setting up public services) to the poorest regions. However, the effect was to distort markets and harm the development chances of these regions in the medium and long term. They also attempted to keep declining industrial sectors alive so as to protect local jobs, even when these sectors were condemned in the long term. These government responses failed to reduce inequality, generate new jobs in lagging areas or trigger a culture of economic dynamism. Moreover these actions had unintended consequences, creating a culture of dependency on the part of recipient regions, many of which are now trapped in a vicious circle of under development.

Recent analysis at the OECD, however, is leading to a new paradigm in regional policies which promotes integrated, co-ordinated and tailored investments to unleash regions' own resources and assets (Table 1.1). This new paradigm is driven by recent OECD research, which found that (OECD 2009a, 2009b, 2011b):

- It is not just the advanced, wealthy regions that drive national economic health − less developed regions make a significant contribution too.
- Growth patterns can come in different ways and vary in different types of regions. This implies there are opportunities for growth in all types of regions.
- Growth rates depend chiefly on the human capital, infrastructure and innovation already present in a region.

Table 1.1. **The paradigm shift in regional policy**

	Traditional regional policies	New paradigm
Objectives	Balancing economic performance by temporary compensation for regional disparities	Tapping underutilised regional potential for competitiveness
Strategies	Sectoral approach	Integrated development projects
Tools	Subsidies and state aid	Soft and hard infrastructure
Actors	Central government	Different levels of government
Unit of analysis	Administrative regions	Functional regions
→	Redistributing from leading to lagging regions	Building competitive regions to bring together actors and targeting key local assets

Source: OECD (2009), *Regions Matter: Economic Recovery, Innovation and Sustainable Growth*, OECD Publishing, doi: *10.1787/9789264076525-en*.

To help policy makers develop the right kind of regional policies, this report identifies *i*) the regions which have the greatest potential for growth and to contribute to the national economy; *ii*) the key factors responsible for growth; and *iii*) the main bottlenecks to growth in regions that are growing more slowly than the rest. Our research

combines quantitative methods (to examine common growth trends in all OECD regions) with qualitative methods (regional case studies).

The report is divided into three chapters. Chapter 1 measures growth trends in GDP *per capita* among OECD regions (Box 1.1) focusing on the trends within three types of OECD regions (predominantly urban, intermediate and predominantly rural). It then elaborates two taxonomies that will serve as tools for identifying the common factors driving growth in converging regions and absent in non-converging regions. The taxonomies also measure the contribution to aggregate growth by different types of regions. Chapter 1 finds a strong growth potential in rural and intermediate types of regions, particularly in regions with levels of GDP *per capita* that are below the national average. The large number of regions with "catching-up potential" implies that supporting their growth will have important implications for aggregate growth. Chapter 2 asks how less developed regions can catch up. This chapter focuses on identifying and analysing the main factors responsible for growth, and the main bottlenecks, for regions at different levels of development. It bases the analysis on five factors for growth – infrastructure, human capital, labour market, innovation, agglomeration and connectivity and productivity – to which it allocates measurable indicators.

Chapter 3 supplements the theory of Chapters 1 and 2 with information from 23 OECD regional case studies. The case study regions are divided into two groups: *i*) those dynamic regions which over a 12 year period have caught up with the national average GDP *per capita*; and *ii*) those less dynamic regions which have not yet caught up to national averages. This allows us to tease out, for each group of regions, the growth promoters and bottlenecks. The above work is then brought together at the end of Chapter 3 for a deeper analysis and along with the main conclusions from Chapters 1 and 2 it is presented in the executive summary to develop concrete policy recommendations.

Box 1.1. **What do we mean by "region"?**

The word region can mean very different things. In this publication, region is used to mean a sub-unit within a country, rather than supra-national groupings of countries.

How does the OECD classify regions within each member country? Its classification is based on two territorial levels. The higher level (Territorial level 2 or TL2) consists of 362 large regions. This type of region represents the first administrative tier of sub-national government. Examples include the Ontario region, or the Île-de-France, containing Paris. The lower level (Territorial level 3 or TL3) is composed of 1 794 small regions. All the regions lie within national borders and in most cases correspond to administrative regions. Each TL3 region is contained within a TL2 region.

This classification – which, for European countries, is largely consistent with the Eurostat classification – helps us compare regions of about the same size. Indeed these two levels, which are officially established and relatively stable across the OECD, are used as a framework for implementing regional policies in most countries.

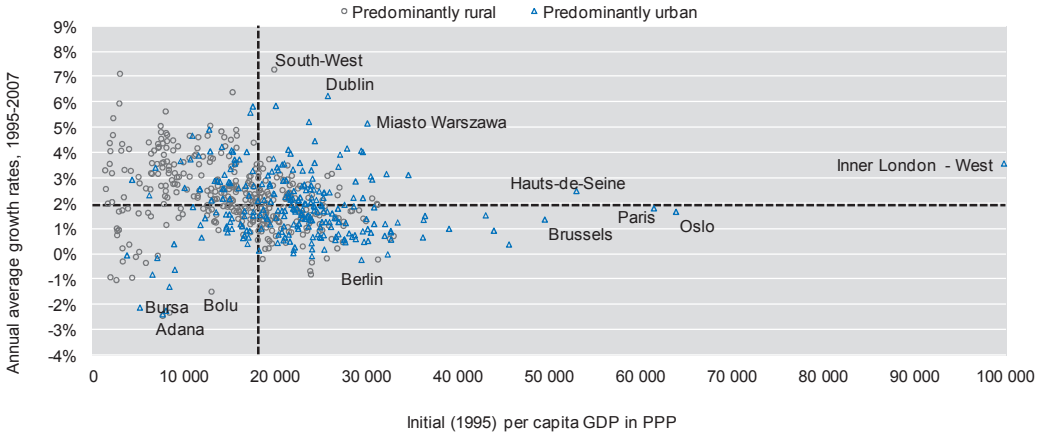
Growth rates in different types of regions

How did we go about the research for this chapter?

Previous OECD research (OECD, 2011a) on regional growth patterns divided all the small (TL3) OECD regions into three types (predominantly urban, intermediate, and

predominantly rural). For comparative purposes, the levels of GDP *per capita* are expressed in constant purchasing power parity (PPP) using 2000 as the base year. Mapping them according to their average gross domestic product (GDP) *per capita* in 1995 and the rate at which their GDP *per capita* grew over the 12 years between 1995 and 2007 revealed no clear pattern between whether the region was urban or rural and its growth rate (Figure 1.1). Some predominantly rural regions grew at a very rapid rate over the 12 years, while some grew much more slowly, or had negative growth, despite starting from the same levels of GDP *per capita*. Urban areas showed similar differences. This suggested that there is no unique recipe for high and sustainable growth and that strong growth can be achieved in various ways. Our task in this research was to find the driving factors explaining the strong growth rates.

Figure 1.1. **GDP *per capita* and annual average growth rates among predominantly urban and rural regions, 1995-2007**



Note: The vertical and horizontal lines correspond, respectively, to the OECD urban and rural average growth rates and the average income level. Regions from the United States, Mexico, Switzerland, Canada, Australia, New Zealand and Iceland are missing due to lack of GDP data for TL3 regions.

Source: OECD (2009), *How Regions Grow: Trends and Analysis*, OECD Publishing, doi: *10.1787/9789264039469-en*.

Our first step was to refine the three-category typology. This was limiting our understanding because it did not allow us *i*) to see if the presence of large built-up areas was affecting the growth of neighbouring regions; *ii*) to understand the effects of the types of problems faced by remote rural regions compared to rural regions close to a city, where a wider range of services and opportunities are commonly available; or *iii*) to pinpoint any other factors that might be contributing to growth rates.

For these reasons, we improved the regional typology by dividing the small OECD regions into the following five categories (Brezzi *et al.,* 2011):

1. Predominantly urban region (PU).
2. Intermediate region close to a city (INC).
3. Intermediate remote region (INR).
4. Predominantly rural region close to a city (PRC).
5. Predominantly rural remote region (PRR).

Annex 1.A1 explains how these categories were chosen based on size of population and driving distance to the nearest urban area. For these five regions we looked at annual average growth rates and GDP *per capita* levels for the 12 years between 1995 and 2007 (Table 1.2).[1] This shows that:

- **Urban regions have significantly higher *per capita* income levels, while rural regions close to a city have the lowest**: GDP *per capita* in urban regions is approximately 24% higher than the OECD average, followed by intermediate regions close to a city (1% lower than the OECD average), rural remote regions (11% below), intermediate remote regions (11% below), and finally rural regions close to a city (21% below).
- **Rural regions display the fastest growth in GDP *per capita***, regardless of whether they are remote from or close to a city. Rural regions close to cities grew at an average annual rate of 2.33%, while remote rural areas averaged 2.24% growth. On the other hand, intermediate remote regions recorded the third highest growth rate (2.15%), followed by urban regions (1.93%), and intermediate regions close to a city have seen the lowest growth rates on average (1.81%).

Table 1.2. **Initial GDP *per capita* and annual average growth rates in GDP *per capita* among the five TL3 region types, 1995-2007**

Type of OECD region	GDP *per capita* in PPP			
	n	Growth (1995-2007)	Initial levels (1995)	Ratio to OECD average
Urban (PU)	233	1.93%	22 568	124%
Rural close to city (PRC)	199	2.33%	14 324	79%
Rural remote (PRR)	123	2.24%	16 234	89%
Intermediate close to city (INC)	280	1.81%	17 950	99%
Intermediate remote (INR)	15	2.15%	16 096	89%
Total	850	2.06%	18 172	100%

Source: OECD Regional Database.

Our next task was to understand the factors behind these two trends.

Why do rural areas grow fastest?

These high growth rates could, in principle, be driven by adverse population dynamics, i.e. regions are growing fast in *per capita* terms due to the "denominator effect" of population decline rather than increases in GDP. The analysis in Annex 1.A2, however, does not support this hypothesis. It seems that as rural regions started from much lower initial levels of GDP in 1995 (see Table 1.2), they are beginning to catch up with the wealthier urban regions. Other hypotheses (see World Bank, 2008) examining the spatial dimension associated with the process of development suggest it is closely linked to urbanisation or agglomeration forces driven by density and concentrations of population. While this might be the case amongst developing countries, among OECD countries we find no evidence of this hypothesis (see Box 1.2). Population density is neither a necessary nor a sufficient condition for the strong performance of OECD regions. Furthermore the top performing OECD large regions are gradually becoming less populated and less densely populated over time.

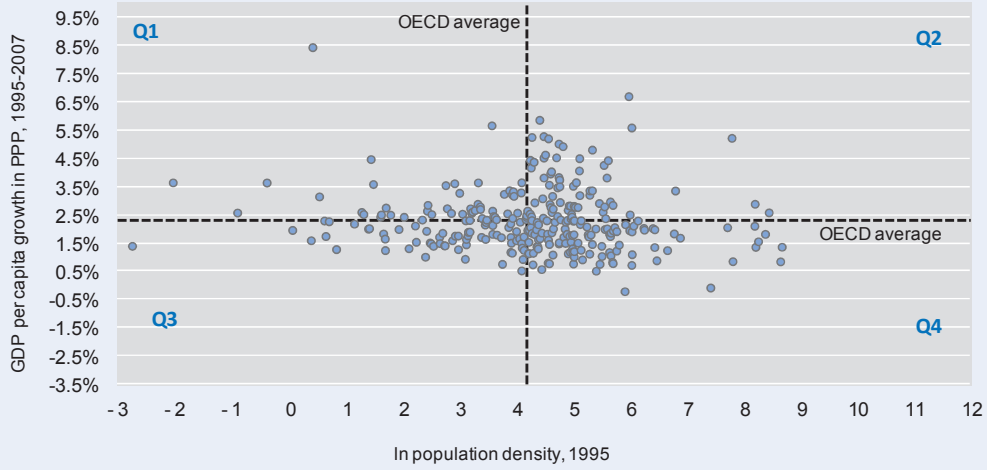
Box 1.2. **Population density: How does it affect regional growth?**

Do regions need to attain a certain level of population density to grow? The figures below examine the relationship between population density and annual average growth rates in log terms over a 12-year period among large (i.e. TL2) and small (i.e. TL3) OECD regions. Both figures reveal:

- A significant number of regions with high population density and high growth rates (quadrant 2);
- A large number of regions with high population density and low growth rates (quadrant 4);
- A number of regions with low density of population and high growth rates (quadrant 1).

Thus, **population density does not appear to be a necessary or sufficient condition for high sustained growth rates**.

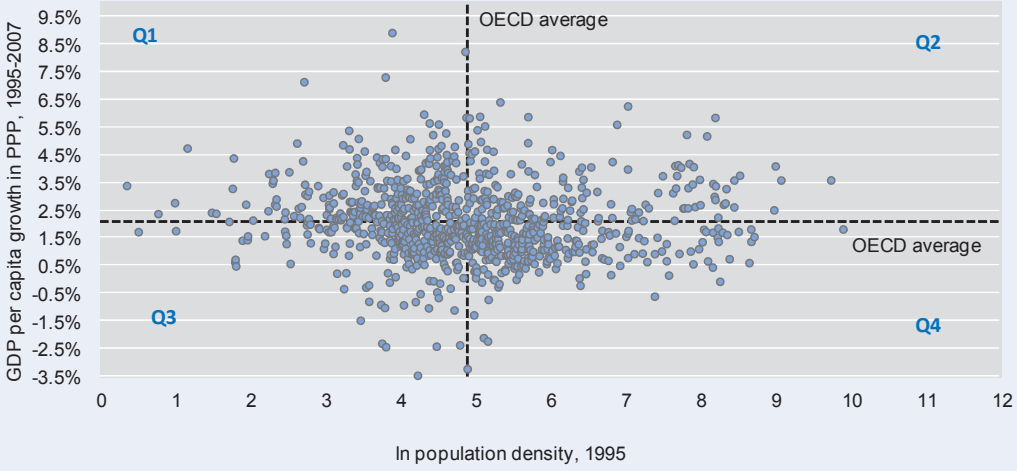
Population density and annual average growth rates, TL2 regions, 1995-2007



Note: Population density is defined by population per square kilometre.

Source: OECD Regional Database (2011).

Population density and annual average growth rates, TL3 regions, 1995-2007



Note: Population density is defined by population per square kilometre.

Source: OECD Regional Database (2011).

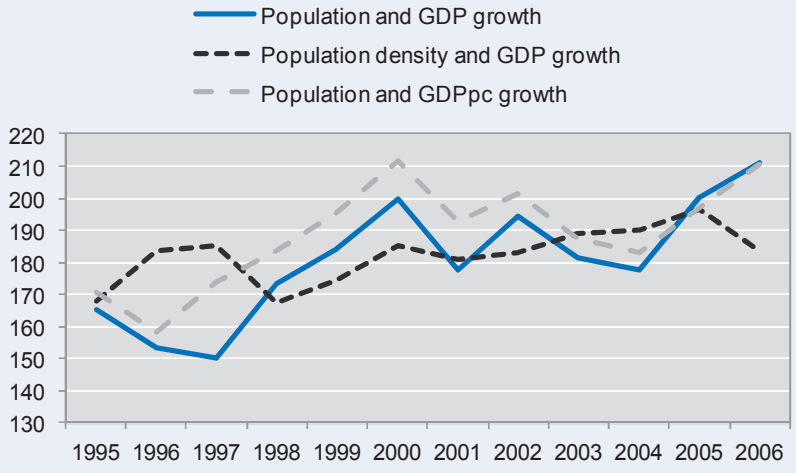
Box 1.2. **Population density: How does it affect regional growth?** *(cont.)*

The second analysis explores the relationship between concentration and efficiency among TL2 regions and examines whether the most populated (and most densely populated) regions tend to display faster or declining GDP *per capita* growth rates. The analysis follows a three-step computational approach (Cuberes, 2010):

- Rank regions by population size (and population density) from high to low. Rank 1 corresponds to the region with the largest population (population density) and rank n to the smallest.
- Compute the 75th percentile of regions' growth rates (in GDP and GDP *per capita*) and consider regions whose growth rate is larger or equal to this threshold, thus capturing the fastest growing quartile.
- Compute the average rank of the fastest growing regions (from step 2) for each year.

The results displayed in the figure below reveal a clear upward trend on the Y-axis (the average rank of the fastest growing 25% of regions) for the three combinations considered. This upward trend reveals that the fastest growing regions are gradually become less populated and less densely populated over time. This runs counter to the belief that agglomeration effects will bring lasting benefits to regions.

Population and population density in the fastest growing 25% of TL2 regions, 1995-2007



Source: Garcilazo, J.E. and J. Oliveira Martins (2012), "The Contributions of Regions to Aggregate Growth", paper presented at the Annual ERSA Conference, Stockholm August 2010, *OECD Regional Development Working Papers*, OECD Publishing.

Why are urban regions wealthier and how does that affect growth?

A major strand of the economic geography literature argues that there are many benefits from economic activity being geographically concentrated (known as "agglomeration"; Krugman, 1991; Krugman and Venables, 1995, 1996; Venables, 1996; Puga and Venables, 1996, 1997; Puga, 1998, 1999; Martin and Ottaviano, 2001). This line of argument stresses the economies of scale, labour market pooling, forward and backward linkages, network effects and knowledge "spillovers" offered by densely populated areas that firms may be able to exploit. It is these effects that drive urbanisation processes and account for the well-established empirical observation that large urban areas tend to be characterised by higher productivity and higher levels of *per capita* value added.

One explanation for the faster rates of growth in rural *versus* urban regions is that the income levels of poor regions will tend to catch up with those of richer regions through their ability to import technical, managerial and other innovations from the more advanced economies and by imitating the leaders. This catching-up process is known as "convergence". Williamson (1965) argues that the early stages of national development increase disparities among regions, but that over time development leads to convergence in regional income levels (Box 1.3). The primary explanation for Williamson's finding is that, in a country that is catching up, a few regions typically drive growth, and capital and skilled workers are increasingly drawn to them. Rapidly rising productivity causes growth to accelerate still further in these regions, increasing regional disparities. As time goes on, higher factor costs and/or disadvantages of large agglomerations (diseconomies) − such as higher transportation costs, loss of productivity from long commuting times, and oversupply of labour − emerge in the leading regions, prompting investment capital to shift to places where the potential returns are higher (i.e. those with lower capital per worker). The Williamson Curve is one hypothesis explaining why and when agglomeration economies begin to give way to the forces of convergence.

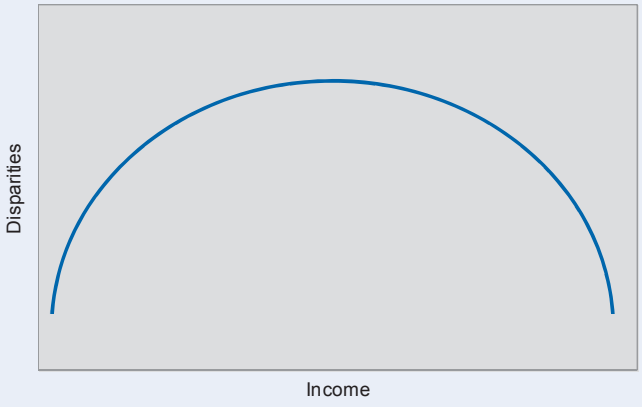
Therefore the dynamics of inter-regional growth disparities are subject to two cross-cutting, but not contradictory, forces: *i*) convergence processes and *ii*) agglomeration, which leads to divergence in income levels across regions. It is perfectly possible to envisage both convergence and agglomeration dynamics at work in the same economy, but they will have the opposite impact on inter-regional disparities. In a neoclassical world dominated entirely by convergence dynamics, poorer regions would tend to grow faster; whereas in a world shaped solely by agglomeration, both forces are possible depending whether the forces of attraction (which cause divergence) dominate the forces of repulsion (convergence). The question, therefore, is: which force predominates, where, when and under what conditions?

Plotting the patterns of growth and initial levels of GDP *per capita* in OECD TL3 regions according to the five categories in the typology is a first step towards answering this question. This exercise reveals a complex and heterogeneous picture overall (Figure 1.2).

Box 1.3. **The Williamson curve**

A **Kuznets curve** is the graphical representation of a hypothesis that as a country develops, there is a natural cycle of economic inequality driven by market forces which at first increases inequality, and then decreases it after a certain average income is attained (Kuznets, 1955). Williamson (1965) expanded upon this idea, claiming that national development creates increasing regional disparities in the early stages of development, while in the later, development leads to regional convergence. This results in an inverted U-shaped curve (see figure below).

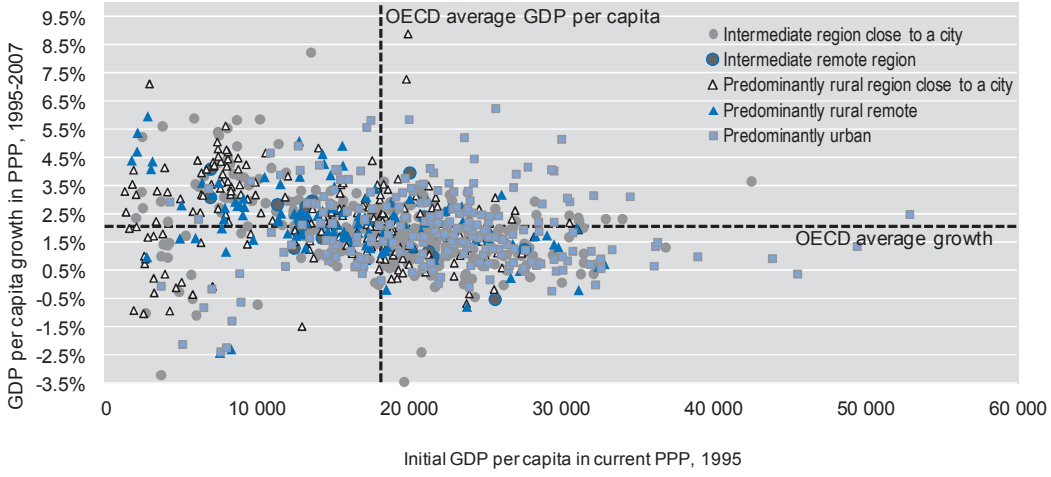
How income disparities among regions reduce over time



Williamson's theory suggests that in a catching-up country there are a few growth poles concentrated in regions which attract the bulk of capital and skilled workers. As productivity rises in these regions it will lead to faster growth, increasing disparities among regions. At later stages, as higher factor costs or diseconomies of agglomeration emerge in these regions, capital is likely to move to other regions with lower capital per worker. In addition, knowledge spillover effects may enhance the reallocation of productive factors across sectors and regions, which leads to convergence in income levels.

Source: Adapted from Williamson, J.G. (1965), "Regional Inequality and the Process of National Development: A Description of the Patterns", *Economic and Cultural Change*, Vol. 13.

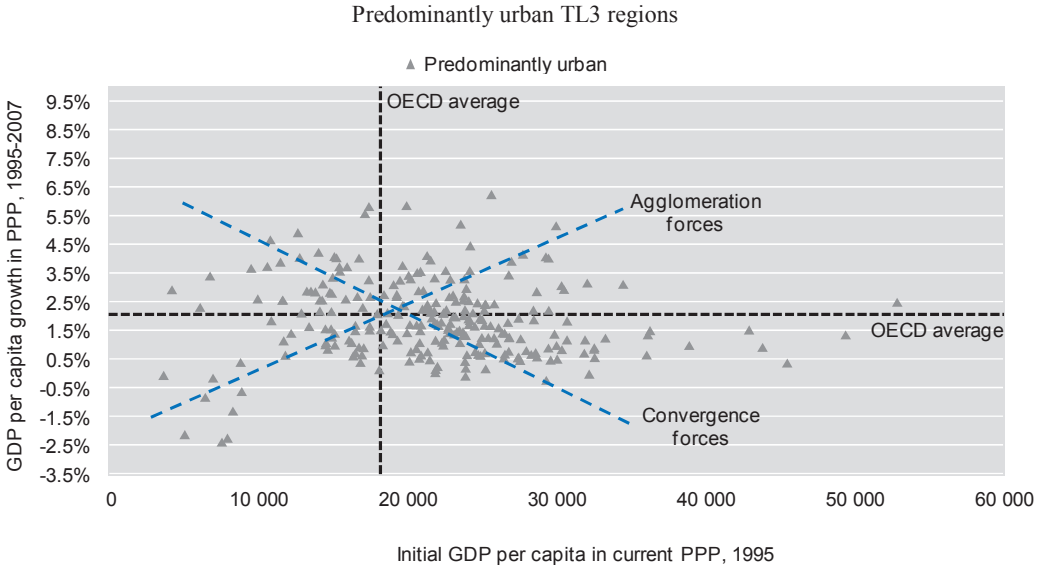
Figure 1.2. **Growth trends across regions, 1995-2007**



Source: OECD Regional Database (2011).

To get a clearer picture of what is happening in each of the categories, we do the same exercise for each of them. This shows that of the OECD's **urban regions**, 78% had above average GDP *per capita* in 1995 (Figure 1.3). At the same time, the majority (56%) are growing more slowly than the OECD average, indicating that the growth rates of urban regions above a certain level of GDP *per capita* tend to slow down, which supports the theory that regions' incomes will eventually converge with each other. Figure 1.3 also shows a group of urban regions that combine the fastest GDP *per capita* growth rates with higher than average GDP *per capita* levels, which indicates that agglomeration forces are at work. There is also a significant group of vulnerable urban regions experiencing both low growth rates and low levels of development.

Figure 1.3. **Growth trends in urban regions, 1995-2007**



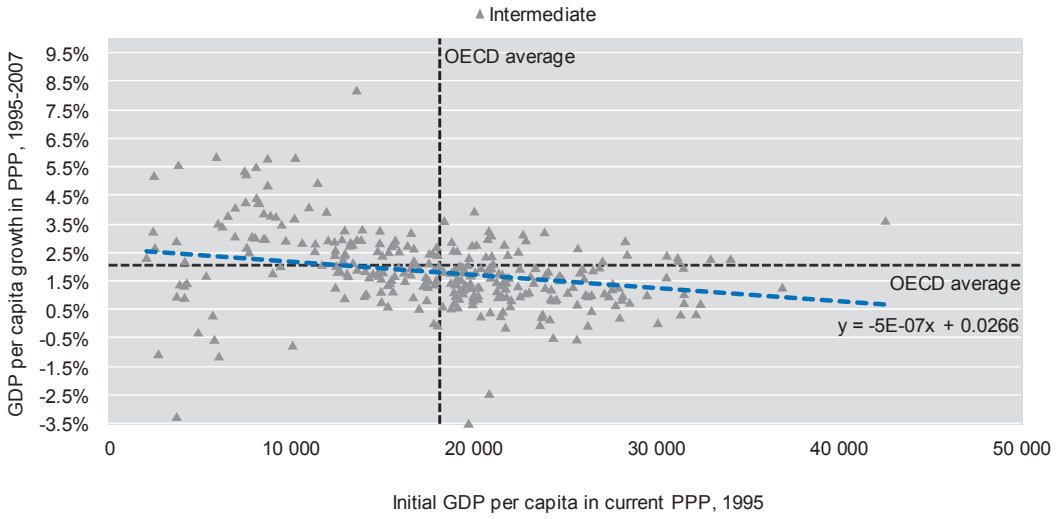
Note: The vertical and horizontal lines correspond, respectively, to the OECD TL3 average growth rates and the average GDP *per capita* level. Regions from Australia, Canada, Iceland, Mexico, New Zealand, Switzerland, and the United States are missing due to lack of GDP data at TL3 level.

Source: OECD Regional Database.

Intermediate regions experienced a strong process of convergence between 1995 and 2007 (Figure 1.4, and see Annex 1.A2 for the analysis). Those with higher levels of GDP *per capita* appear to be growing more slowly; growth rates above 3.5% are only observed in regions with initial GDP *per capita* levels below the OECD average. There are no intermediate regions that combine high growth with high *per capita* incomes. In contrast there is marked variability among less developed intermediate regions (those with GDP *per capita* of below USD 10 000). Some appear to have the fastest growth rates, while others have the slowest among the intermediate regions.

Figure 1.4. **Growth trends in intermediate regions, 1995-2007**

TL3 regions



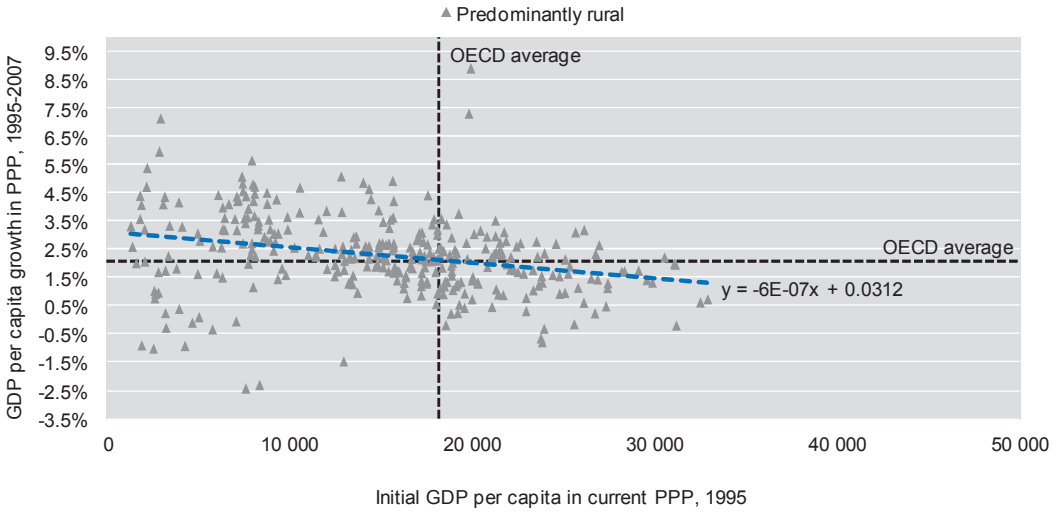
Note: The vertical and horizontal lines correspond, respectively, to the OECD TL3 average growth rates and the average GDP *per capita* level. Regions from Australia, Canada, Iceland, Mexico, New Zealand, Switzerland, and the United States are missing due to lack of GDP data at TL3 level.

Source: OECD Regional Database.

Rural regions also appear to be converging with each other more strongly than intermediate regions. The highest growth rates (above 3.5%) of all regional types are only to be found in regions with below average initial GDP *per capita* (Figure 1.5). Rural regions with above average levels of GDP *per capita* appear to be growing more slowly. The estimated slope line in Figures 1.4 and 1.5 is steeper among rural regions than among intermediate regions and formal statistical tests confirm this in Annex 1.A2.

Figure 1.5. **Growth trends in rural regions, 1995-2007**

TL3 regions



Note: The vertical and horizontal lines correspond, respectively, to the OECD TL3 average growth rates and the average GDP *per capita* level. Regions from Australia, Canada, Iceland, Mexico, New Zealand, Switzerland, and the United States are missing due to lack of GDP data at TL3 level.

Source: OECD Regional Database.

These findings suggest that:

- In much of the OECD the strong forces pushing less developed regions to grow to the same levels as urban regions are enough to resist the forces of agglomeration. Had this not been the case, we would be seeing initial GDP disparities increasing over time. The absence of convergence among urban regions, however, suggests that the benefits of agglomeration remain important in driving growth in urban areas.
- Only urban regions demonstrate high initial *per capita* GDP levels and high growth rates. This suggests that agglomeration forces only operate in urban regions and are absent in intermediate and rural regions.
- There are opportunities for growth in all types of regions, regardless of whether they are urban, intermediate, rural and close to a city or rural and remote.
- The highest growth rates appear mainly in predominantly rural and intermediate regions with the lowest initial *per capita* GDP levels suggesting there is a strong catching-up potential in these type of regions.

The findings from this section suggest that growth dynamics do tend to vary with the level of a region's development. **Broadly speaking, regions with lower levels of development tend to grow faster than regions with higher levels.** This relationship suggests that factors influencing the performance and growth of regions will also likely vary according to their stages of development. This is the subject of the next section.

Categorising regions by their potential for growth

These results suggest that regional performance is linked to a region's initial level of development. To explore this further, this section develops a taxonomy for categorising regions according to their performance against national averages, and then against both national and OECD averages.

Rather than using the categories of urban, intermediate and rural, for this analysis we regrouped regions according to their starting point in 1995 (in GDP *per capita*) and their growth rates between 1995 and 2007. This approach allows for identifying commonalities among regions with similar levels of development or distance to a production possibility frontier (Aghion and Howitt, 2006). The taxonomy described in this section will be used in later chapters as a tool to analyse the key drivers of growth at each level of development and its impact on aggregate output, allowing us to work beyond average values, which are not entirely adequate when analysing regional growth dynamics and their contributions to aggregate growth (OECD, 2011b).

We also chose to analyse the larger OECD TL2 regions, because there are more data and indicators available for these regions. Data used for comparing the performance of regions with national and international standards are drawn from the *OECD Regional Database*,[2] covering the 12 years between 1995 and 2007 for 325 TL2 regions. The national benchmark analysis (initially from 1995-2005) was subsequently able to include more years, as data up to 2007 became available. For comparative purposes, the levels of GDP *per capita* are expressed in constant purchasing power parity (PPP) using 2000 as the base year.

How do regions compare with national levels?

The first benchmark compares the performance of TL2 regions to national averages using initial levels of GDP *per capita* (e.g. in 1995) and annual average growth rates in

GDP *per capita* between 1995 and 2007. This has allowed us to classify regions into three groups as follows:

- Regions with large catching-up potential (LCUP): regions whose initial level of GDP *per capita* is less than 75% of the national average.[3] This 75% threshold has been selected in line with the European Commission's choice for Objective One regions (Box 1.4).
- Regions with catching-up potential (CUP): regions whose initial level of GDP *per capita* is below the national average but is not as low as 75% of the national average.
- Advanced regions: regions whose initial level of GDP *per capita* is above the national average.
- We then classified these three categories further according to whether the region's growth rate in GDP *per capita* is above or below the weighted national average. This gives us six groups of regions:

    1. LCUP and above average growth.
    2. LCUP and below average growth.
    3. CUP and above average growth.
    4. CUP and below average growth.
    5. Advanced and above average growth.
    6. Advanced and below average growth.

Box 1.4. **The European Union's regional policy**

The main goal of regional policy in the European Union is economic and social cohesion. To achieve this, more than 35% of the EU's budget is transferred to the less favoured regions (EUR 213 billion between 2000 and 2006). Those regions in the EU lagging behind in their development, undergoing restructuring or facing specific geographical, economic or social problems are to be put in a better position to cope with their difficulties and to benefit fully from the opportunities offered by the single market. The amount of support that regions receive through the EU's regional policy depends on their level of development and the type of difficulties they are facing. In the current 2007-13 funding period, EU regional policy consists of three objectives: *i*) convergence (to promote the development and structural adjustment of regions whose development is lagging behind); *ii*) regional competitiveness and employment; and *iii*) European territorial co-operation. These replace the previous three objectives from 2000-06, which were simply known as Objectives 1, 2 and 3.

The previous findings in this chapter on growth trends for TL3 regions found both forces of convergence and divergence. Applying these forces to the larger regions (TL2) in our taxonomy would give rise to three possible scenarios. The first would be the presence of convergence forces; which would imply the majority of regions would be distributed in the grey cells in Table 1.3, where the majority of regions with a large catching up-potential would display above national average growth rates and the majority of advanced regions would display below average growth.

Table 1.3. **Simulating convergence forces in the taxonomy for the six regional categories**

	Large catching up potential	Catching up potential	Advanced
Above average growth			
Below average growth			

The second possibility would be to find forces of agglomeration (divergence) in our taxonomy. This scenario would suggest the majority of regions would fall into the grey cells in Table 1.4, which shows that the bulk of regions with a large catching-up and a catching-up potential have below average growth rates, while the bulk of advanced regions have above average growth. The final scenario would be a combination of the two, with no clear trend.

Table 1.4. **Simulating divergence forces in the taxonomy for the six regional categories**

	Large catching up potential	Catching up potential	Advanced
Above average growth			
Below average growth			

Descriptive statistics for the six categories are provided in Table 1.5, which depicts initial levels of GDP *per capita* (average values) and annual average growth rates.

Table 1.5. **Initial levels of GDP *per capita* and growth rates for the six regional categories, 1995-2005**

	Above average growth		Below average growth	
	GDP *per capita*, 1995	Growth rate	GDP *per capita*, 1995	Growth rate
LCUP	8 820	2.45%	9 186	1.62%
CUP	18 326	2.47%	18 399	1.95%
Advanced	25 368	2.87%	21 572	1.50%

Notes: Based on 326 observations. TL2 data are not available for Switzerland and New Zealand. Luxembourg is excluded. The OECD average initial GDP *per capita* value is 18 837 and annual average growth rate is 2.17%. LCUP = regions with large catching up potential; CUP = regions with catching-up potential.

Source: OECD Regional Database (2009).

Table 1.6 and Figures 1.6 to 1.9 summarise how the 325 regions are distributed across this classification. These statistics reveal that most OECD TL2 regions (51%) have catching-up potential defined by those regions with initial levels of GDP *per capita* below the national average but above the 75% threshold value. Advanced regions make up the second most numerous group (34%). The least represented (15%) are regions with a large

catching-up potential and an initial GDP below 75% of their respective national average values.

Table 1.6. **Distribution, contributions to GDP growth and population share for the six regional categories, 1995-2007**

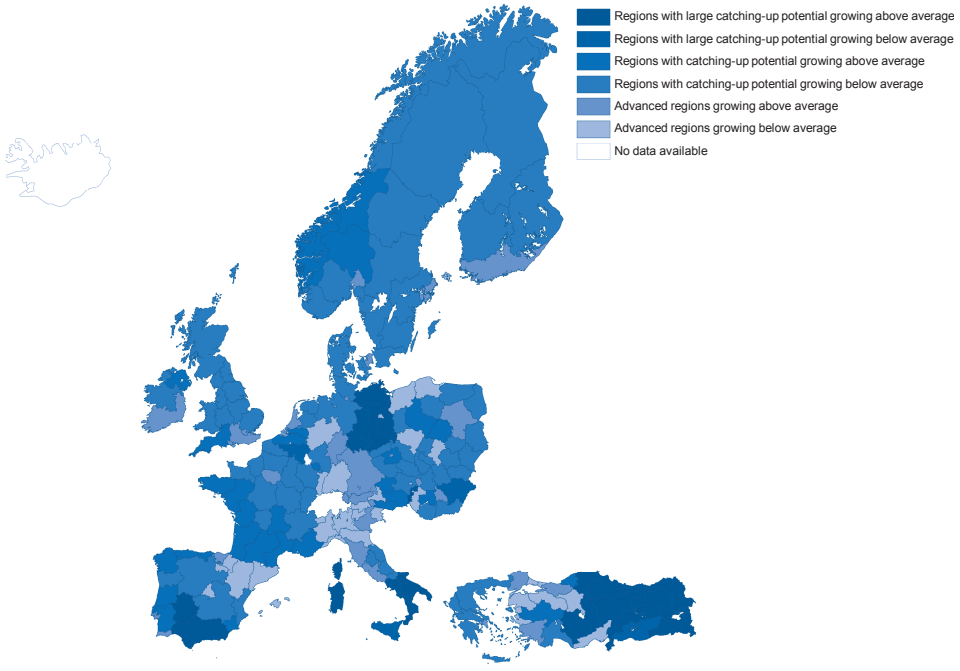
	Growing above average	Growing below average
Regions with large catching up potential (LCUP)	37 regions or 11%	15 regions or 4%
	Population share = 8%	population share = 3%
	Contribution to growth = 4%	Contribution to growth = 1%
Regions with catching up potential (CUP)	61 regions or 19%	103 regions or 32%
	Population share = 18%	Population share = 24%
	Contribution to growth = 21%	Contribution to growth = 17%
Advanced regions	54 regions or 17%	55 regions or 17%
	Population share = 26%	Population share = 20%
	Contribution to growth = 39%	Contribution to growth = 17%

Source: OECD Regional Database (2009).

The data also reveals that amongst LCUP regions, more of them are growing above the national average (11%) as opposed to more below it (4%). In contrast, among the CUP group there are more regions growing more slowly than the national average (32%) than those growing faster (19%). Finally, among the advanced regions, equal numbers are outperforming the national average as are underperforming.

Figure 1.6. **How OECD regions perform against national averages: Europe**

TL2 regions, initial level and growth of GDP *per capita*, 1995-2007

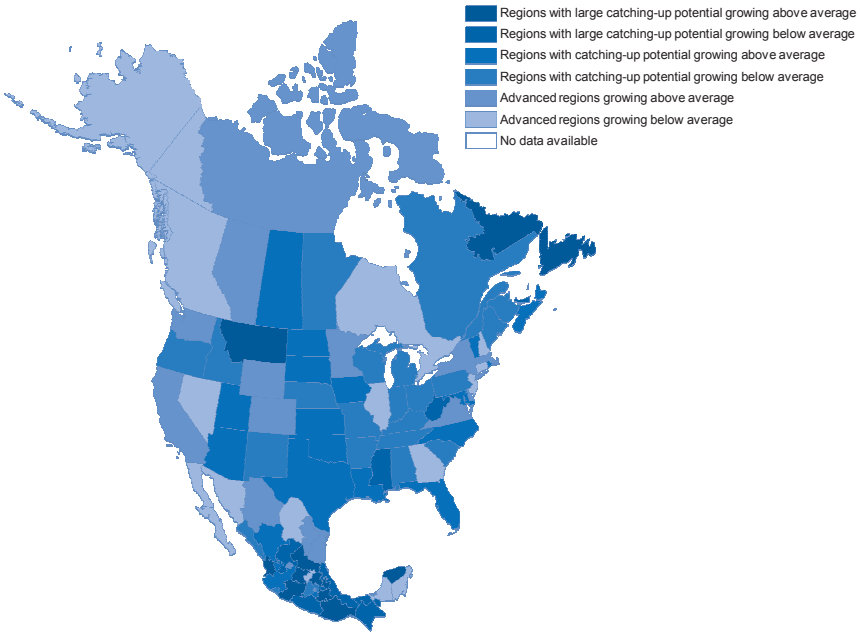


Note: This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Source: OECD Regional Database (2009).

Figure 1.7. **How OECD regions perform against national averages: North America**

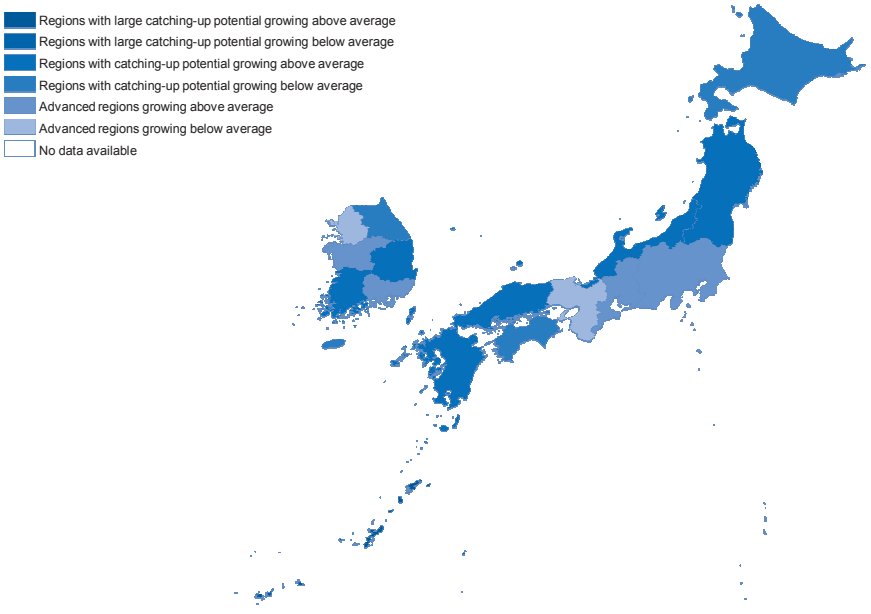
TL2 regions, initial level and growth of GDP *per capita*, 1995-2007



Note: This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
Source: OECD Regional Database (2009).

Figure 1.8. **How OECD regions perform against national averages: Asia**

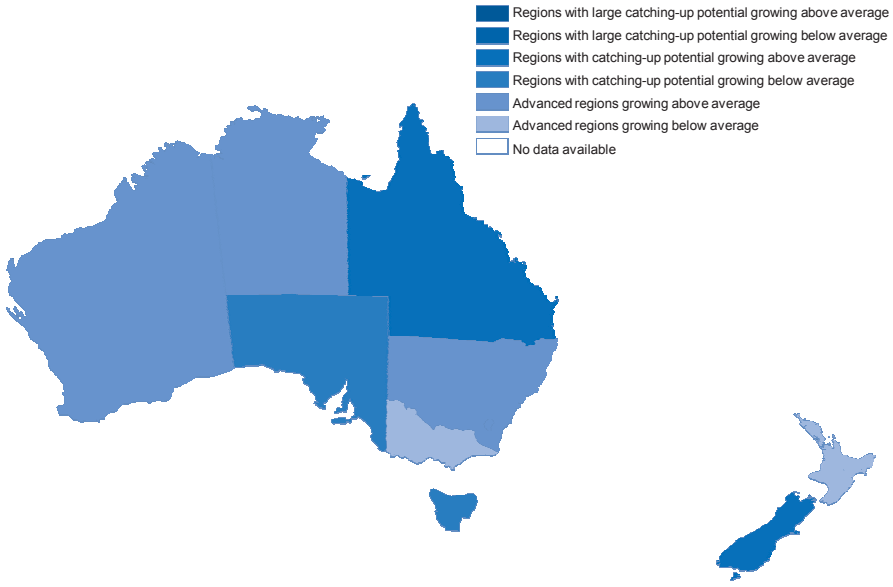
TL2 regions, initial level and growth of GDP *per capita*, 1995-2007



Note: This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
Source: OECD Regional Database (2009).

Figure 1.9. **How OECD regions perform against national averages: Oceania**

TL2 regions, initial level and growth of GDP *per capita*, 1995-2007



Note: This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
Source: OECD Regional Database (2009).

How do different types of regions contribute to national growth?

While these descriptive statistics are quite revealing and interesting, the next step is to examine the impact on aggregate growth of regions from these six categories, and understand what drives growth in these six categories of regions so as to better tailor polices to particular types of regions.

Underdeveloped regions that are growing very slowly can potentially impose high costs on national budgets. For example, regions characterised by high and rising elderly and jobless dependency ratios may lose their young and highly skilled workers in search of opportunities elsewhere. Such regions can develop a dependency culture – on subsidies and transfers – rather than exploiting their own resources.

Contributions to national growth depend on two factors: the performance of regions (i.e. growth rates) and their relative size (i.e. GDP share). While individually, the impact on national growth of underdeveloped regions can be relatively small, in aggregate the contribution to national growth of all regions with catching-up potential is substantial. In some countries they account for over half of aggregate growth (OECD, 2009b). Therefore, improving the performance of these regions can save costs in the medium and long term, while also raising national growth.

Table 1.7 shows for each OECD country the contribution to national growth of each group and the groups' overall contributions weighted by the relative size of the country.

Table 1.7. **Contributions to national growth of the six categories of OECD TL2 regions, 1995-2007**

In %

	Regions with large catching-up potential		Regions with catching-up potential		Advanced regions	
	Growing above average	Growing below average	Growing above average	Growing below average	Growing above average	Growing below average
Australia	0	0	22	7	49	22
Austria	3	0	38	12	17	30
Belgium	0	19	61	0	0	20
Canada	2	0	5	18	28	46
Czech Republic	0	0	14	48	38	0
Denmark	0	0	0	49	51	0
Finland	0	0	0	35	65	1
France	1	0	39	29	30	2
Germany	14	0	1	12	43	30
Greece	0	0	0	-16	116	0
Hungary	0	14	11	9	56	9
Iceland	-	-	-	-	-	-
Ireland	0	0	0	19	81	0
Italy	16	5	0	6	30	43
Japan	1	0	23	4	65	8
Korea	0	0	20	3	31	47
Mexico	16	8	9	11	39	17
Netherlands	0	0	22	27	51	0
New Zealand	-	-	-	-	-	-
Norway	0	0	30	32	39	0
Poland	0	0	17	27	30	26
Portugal	0	0	34	20	46	0
Slovak Republic	0	0	0	67	33	0
Spain	17	0	10	22	6	46
Sweden	0	0	0	58	42	0
Switzerland	-	-	-	-	-	-
Turkey	32	4	6	5	20	33
United Kingdom	0	0	11	46	43	0
United States	0	1	31	19	36	13
Average unweighted	4	2	16	22	42	15
Average weighted	4	1	21	17	39	17

Note: LCUP regions display an initial level of GDP below 75% of the national average; CUP regions are above the 75th percentile but below the national average and advanced regions are above average levels. Growing regions record above annual average growth rates in GDP *per capita* and underperforming below average rates. The weighted average accounts for the relative size of each country measured by their GDP share of 2005.

Source: OECD Regional Database (2011).

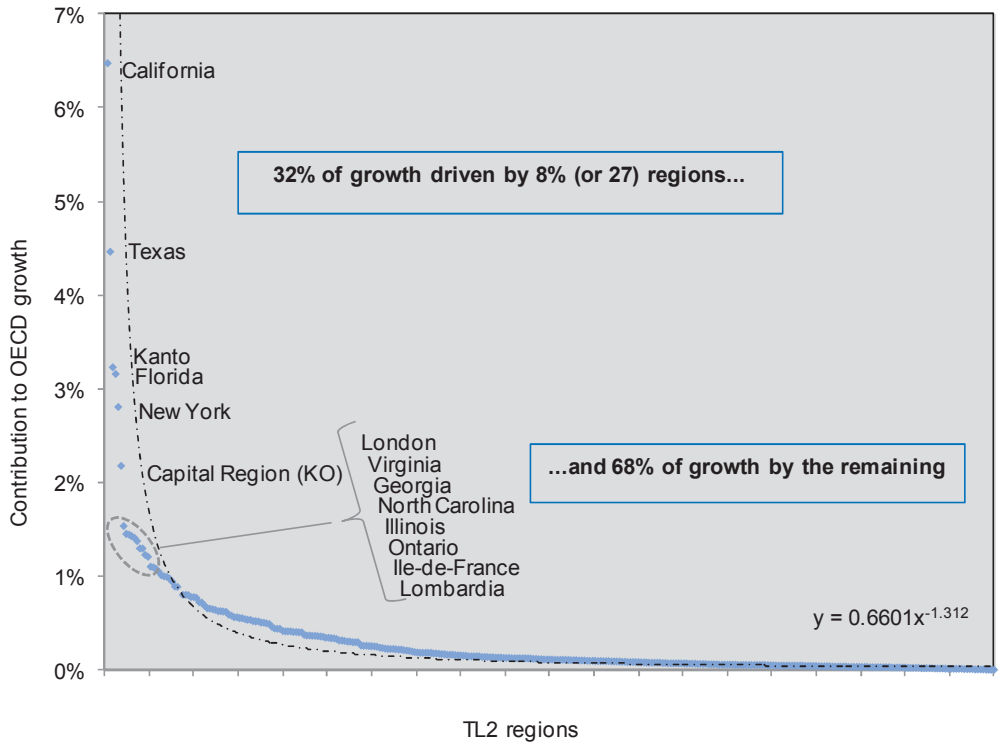
Although the advanced groups of regions growing above average contributes most to aggregate growth (almost 40%), the contribution of regions with LCUP and CUP is also significant:

- The contribution of CUP above average growth was larger than CUP below average growth even though there are fewer of these types of regions (61 versus 103) and their population share is also lower (17% versus 21%; Table 1.7). In six OECD countries (Belgium, France, Austria, Portugal, United States and Norway) regions with CUP and above average growth accounted for no less than one-third of national growth.
- The contribution to national growth by regions with LCUP and above average growth was more than 15% in Italy, Mexico, Spain and Turkey and 14% in Germany. In contrast, the contribution to national growth by regions with LCUP and below average growth only exceeded 10% in Belgium and Hungary.

Contributions to national growth are highly skewed − a small proportion of regions make disproportionately large contributions to aggregate growth. In contrast, the majority of individual regions contribute only marginally to overall growth, but their aggregate contribution is quite substantial.

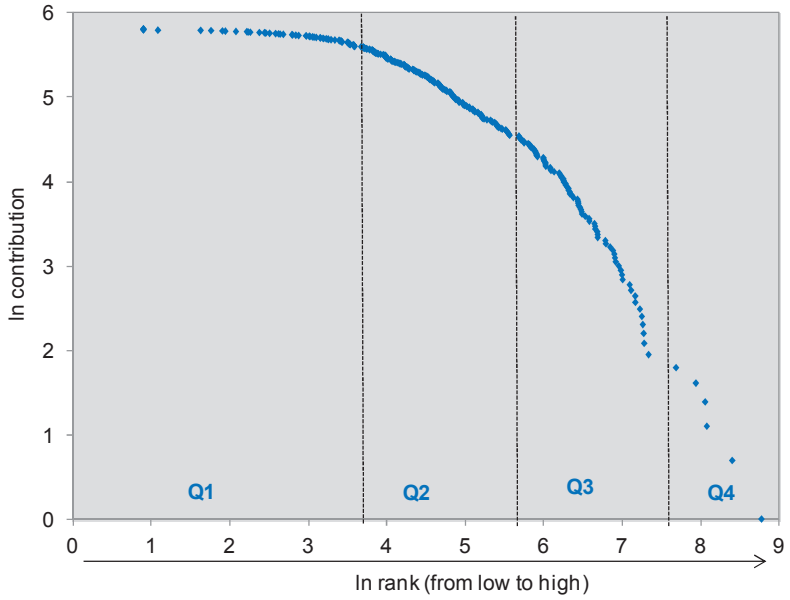
Figures 1.10 and 1.11 display the contributions of all OECD TL2 regions to aggregate growth (expressed in logarithms in Figure 1.11 on the Y axis and their respective rank in the X axis). Overall, around 2% of the regions account for roughly 22% of aggregate growth (Quadrant 4 in Figure 1.11); the next 24% of regions contribute 57% (Q3); the 53% in Q2 account for nearly 20% of growth and the remaining 20% contribute next to nothing (Q1).

Figure 1.10. **Contributions of large regions to aggregate growth, 1995-2007**



Source: OECD (2011), *Regional Outlook 2011: Building Resilient Regions for Stronger Economies*, OECD Publishing, doi: *10.1787/9789264120983-en*.

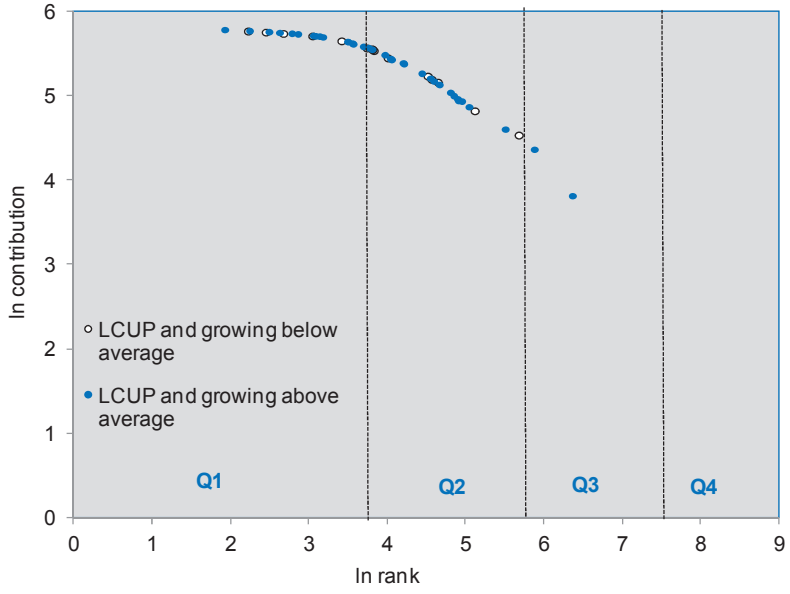
Figure 1.11. **Distribution of OECD TL2 regions according to their contributions to OECD growth, 1995-2007**



Source: OECD Regional Database (2011).

Figures 1.12 to 1.14 display the contributions by LCUP, CUP and advanced regions to growth. LCUP regions contributed 5% of total OECD growth between 1995 and 2007. About half (51%) of these regions belong to Q1 in Figure 1.12, 45% to Q2 and just two LCUP regions (Andalucía and Campania) appear in Q3, i.e. they make the biggest contribution to OECD growth.

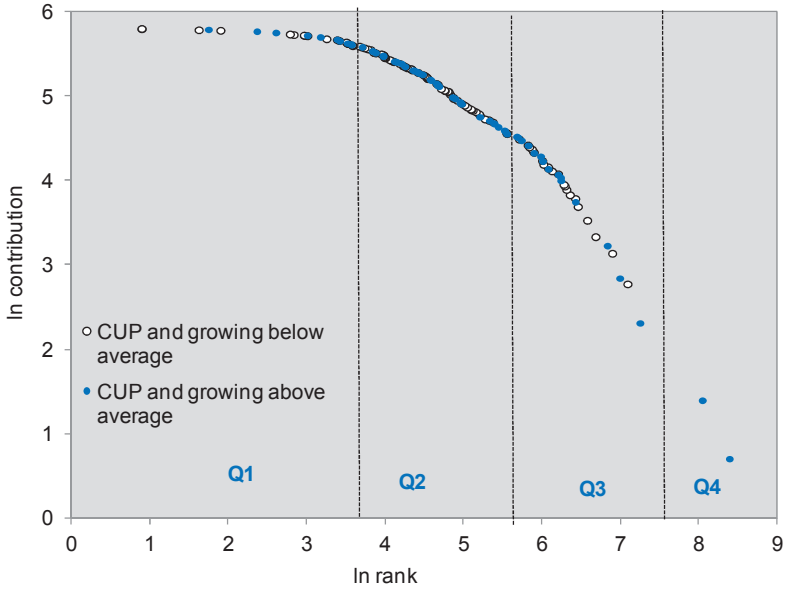
Figure 1.12. **How LCUP regions contributed to OECD growth, 1995-2007**



Source: OECD Regional Database (2011).

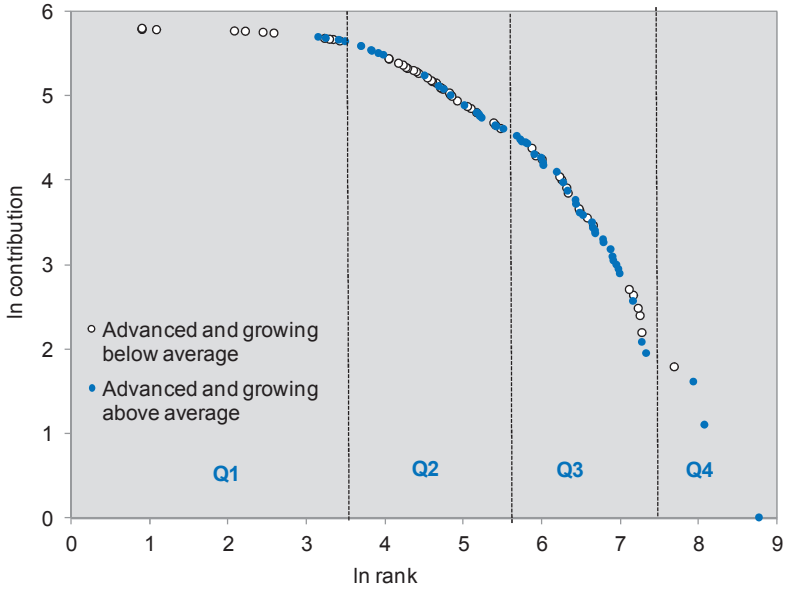
CUP regions are mainly located in Q2 of Figure 1.13 (contributing approximately 57%). A further 22% are in Q1, and 20% (large contributors) are in Q3. Only Florida and Texas are in Q4, underlining their disproportionate contribution to aggregate growth.

Figure 1.13. **How CUP regions contributed to OECD growth, 1995-2007**



Source: OECD Regional Database (2011).

Figure 1.14. **How advanced regions contributed to OECD growth, 1995-2007**



Source: OECD Regional Database (2011).

Advanced regions are equally divided between Q3 (39%) and Q2 (39%). Nevertheless, within this category the above average growth group represents the majority of those in Q3, while the below average growth regions form the majority (23%) of those in Q2 (Figure 1.14).

Comparing the contributions to aggregate growth by each group with their population share reveals the *per capita* contribution to aggregate growth (Table 1.8).

Table 1.8. **Contributions to aggregate growth and population share of OECD TL2 regions, 1995-2007**

In %

Taxonomy	Population	Contribution to growth
LCUP and above average growth	8	4
LCUP and below average growth	3	1
CUP and above average growth	18	21
CUP and below average growth	25	17
LCUP and CUP	**53**	**43**
Advanced and above average growth	26	39
Advance and below average growth	20	17

Note: LCUP are regions with very large catching-up potential and CUP regions with catching-up potential.

Source: OECD Regional Database (2011).

This table points to several interesting findings:

- Regions with either LCUP or CUP are home to 53% of the total OECD population.
- There are higher returns to scale (i.e. a greater contribution to growth per person) in regions with higher levels of GDP *per capita* (advanced group) and lower returns to scale in regions with the lowest levels.
- There is important potential contained in the CUP regions which are growing below the national average. This group of regions is home to 25% of the total population and contributes 17% of aggregate growth. Improving the performance of these regions could bring important gains to aggregate growth given the large proportion of population living in them.
- There are more LCUP regions with above than below average growth, which might imply some convergence dynamics at work. The reverse is true for regions with CUP. The fine balance between growing and underperforming in advanced regions is harder to interpret: a fast growing core region that experiences rapid population growth may well see *per capita* GDP decline if the newcomers are less productive on average than the established population. This may nevertheless be good news for the economy as a whole, assuming that the new arrivals are more productive than they were in their previous locations.

In sum the contribution to aggregate growth by regions with CUP and LCUP is not marginal at all. These regions contributed to almost half of the OECD's aggregate growth (43%) between 1995 and 2007 (Table 1.9). Moreover, in ten OECD countries (Austria, Belgium, Czech Republic, France, Norway, Portugal, the Slovak Republic, Sweden, United Kingdom and the United States; Table 1.9), these regions have

contributed more to national growth than the countries' advanced regions. These results reveal the importance of catching-up regions for aggregate performance and suggest that policies targeting these types of regions need not merely be social; rather they should be well-designed economic policies in line with the new regional paradigm.

Table 1.9. **How less-developed regions contribute to national growth**

In %

	LCUP	CUP	LCUP and CUP	Advanced
Australia	0	29	29	71
Austria	3	50	53	47
Belgium	19	61	80	20
Canada	2	23	26	74
Czech Republic	0	62	62	38
Denmark	0	49	49	51
Finland	0	35	35	65
France	1	68	68	32
Germany	14	13	27	73
Greece	0	-16	-16	116
Hungary	14	20	34	66
Ireland	0	19	19	81
Italy	20	6	26	74
Japan	1	26	27	73
Korea	0	23	23	77
Mexico	24	20	44	56
Netherlands	0	49	49	51
Norway	0	61	61	39
Poland	0	44	44	56
Portugal	0	54	54	46
Slovak Republic	0	67	67	33
Spain	17	32	48	52
Sweden	0	58	58	42
Turkey	36	11	47	53
United Kingdom	0	57	57	43
United States	1	50	51	49
Average unweighted	6	37	43	57
Average weighted	5	38	43	56

Source: OECD Regional Database (2011).

Chapters 2 and 3 make use of the six-group taxonomy in the analysis given its simplicity. Other taxonomies considered for analysis (Annex 1.A1) benchmarks a region's initial levels of GDP *per capita* (e.g. 1995) and its growth rate over the same period to national and to OECD standards giving rise to 16 possible combinations. In addition the six-group taxonomy allows us to better focus the analysis on regional effects since it captures relative movements within a common national context. Chapter 2 applies the taxonomy in the analysis by examining the commonalities that are present in a number of indicators presents in regions catching up to the national standards and not present in non-converging regions. Chapter 3 presents 23 case studies of converging and non-converging regions according to this taxonomy.

Notes

1. The sample coverage includes regions from Europe, Norway and Turkey, since GDP data at TL3 level are missing for Australia, Canada, Mexico, and the United States. Also, the extended typology (Annex 1.A1) does not currently include regions in Japan and Korea.
2. Available online at *www.oecd.org/topicstatsportal/0,3398,en_2825_497132_1_1_1_1_1,00.html#522417*.
3. The national average is unweighted, meaning it is computed by summing the GDP of all regions and dividing it by the total population in the country, which is also aggregated using regional data.

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Annex 1.A1

Extended OECD regional typology

To account for differences among rural and urban regions, the OECD established a regional typology, classifying TL3 regions as predominantly urban (PU), intermediate (IN) or predominantly rural (PR). This typology proved to be a meaningful approach to explaining regional differences in economic and labour market performance. However, it did not take into account the presence of "agglomeration forces" or additional impacts of neighbouring regions. In addition remote rural regions typically face a different set of problems than rural regions close to a city, where a wider range of services and opportunities are commonly available.

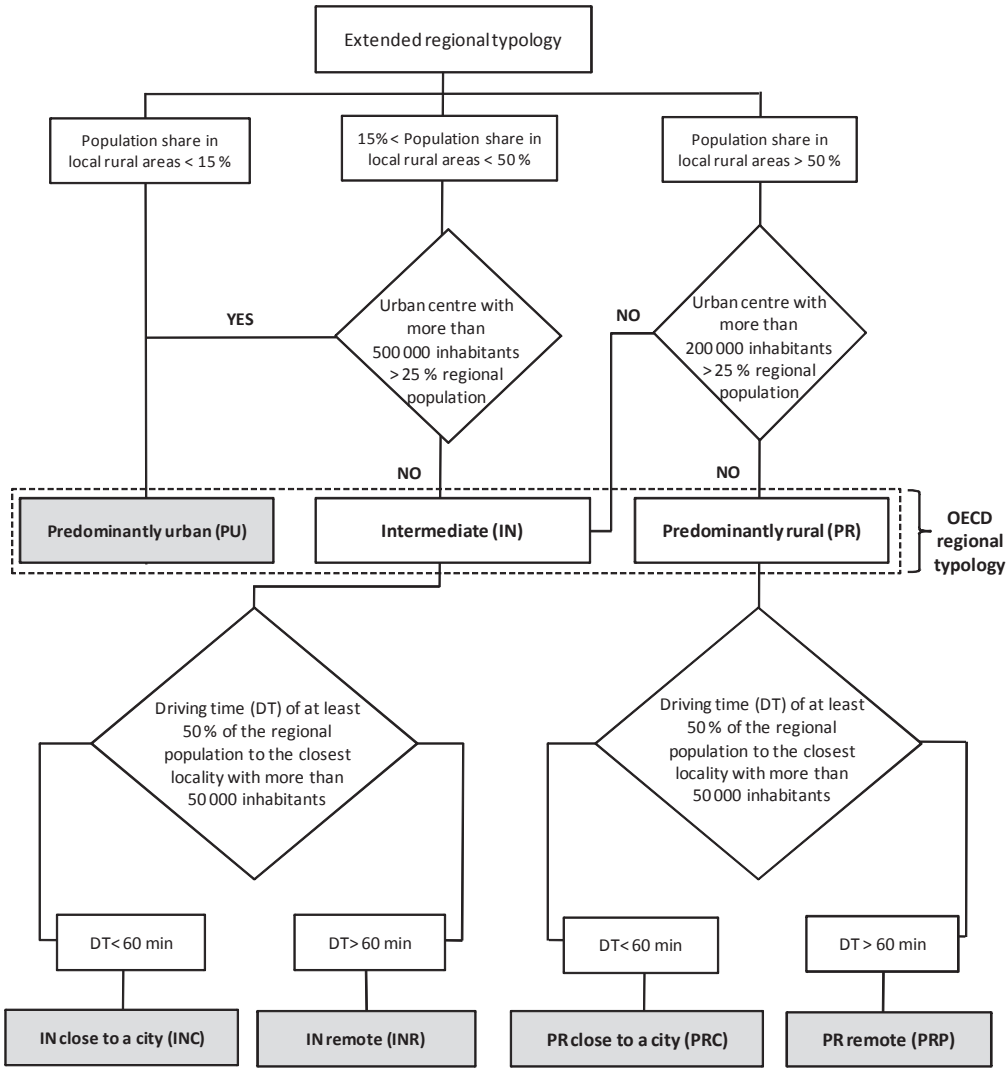
The extended regional typology tries to discriminate between these forces and is based on a methodology proposed by the Directorate General for Regional Policy of the European Commission which refines the current typology by including a criterion on the accessibility to urban centres. This allows distinguishing between remote rural regions and rural regions close to a city in terms of declining and ageing population, level of productivity and unemployment; and similarly it also distinguishes between intermediate regions close to cities and remote intermediate cities.

Figure 1.A1.1 summaries the methodology applied to derived the extended typology in the following steps:

Regions are classified as predominantly urban (PU), intermediate (IN) or predominantly rural (PR) based on the share of population living in local rural areas within each region and size of the urban centres contained in the TL3 regions. A region previously classified as PR (IN), becomes IN (PU) if it contains an urban centre with at least 200 000 (500 000) inhabitants representing 25% of the regional population. These three categories are known as the OECD regional typology.

In a second step, the OECD regional typology is extended by considering the driving time of at least 50% of the regional population to the closest centre of more than 50 000 inhabitants. This only applies to the IN and PR categories, since by definition the PU regions include highly populated localities. The result is a typology containing five categories: PU, INC, INR, PRC, and PRR.

Figure 1.A1.1. **Methodology employed in the extended typology**



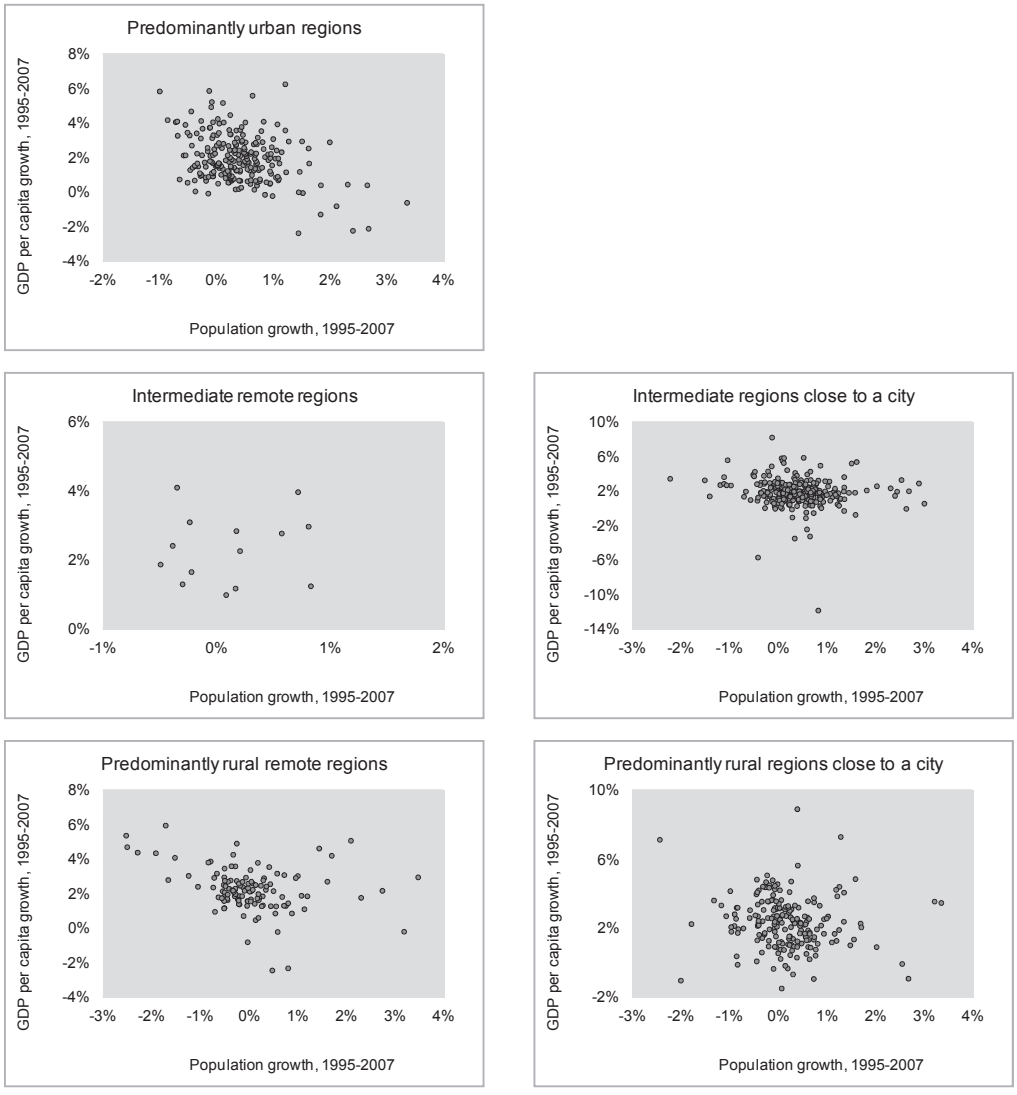
Source: Brezzi *et. al*, (2011), "Extended Regional Typology: The Economic Performance of Remote Rural Regions", *OECD Regional Development Working Papers,* 2011/06, OECD Publishing, Paris.

Annex 1.A2

Factors behind GDP *per capita* growth rates: Detailed analysis

This annex presents in more detail our analysis of the relationship between GDP *per capita* growth rates and *i*) population growth rates; and *ii*) initial GDP of regions in the five regional categories. For the first analysis we graph the relationship between GDP *per capita* growth and population growth among the five categories of region. The graphs allow us to determine whether a statistical pattern is present between the two variables indicating for example whether high growth in GDP *per capita* in any category is associated with population decline. The graphs do not display a clear statistical pattern; rather they display a mixed and heterogeneous picture indicating that high growth rates in GDP *per capita* are driven equally by regions experiencing population increase and population declines and not necessarily due to denominator effects in the latter.

Figure 1.A2.1. **GDP *per capita* growth and population growth in OECD TL3 regions, 1995-2007**



Source: OECD Regional Database (2011).

In the second analysis we measure for trends of convergence and/or divergence within predominantly urban, intermediate and predominantly rural regions using statistical regression techniques (i.e. a beta convergence test). The analysis of beta convergence measures the relationship between the initial GDP of regions and their GDP *per capita* growth rates. A negative coefficient implies convergence, thus indicating that lower income regions on average grow faster and high incomes regions on average grow more slowly. A positive coefficient implies divergence, indicating that richer regions grow even faster while poor regions growth relatively more slowly.

We treat intermediate regions close to a city and intermediate remote regions as intermediate regions and similarly rural regions close to a city and remote rural regions as rural regions. Our sample totals 233 TL3 urban regions, 295 intermediate regions and 322 rural regions. These regions are mainly European TL3 regions including Turkey, since our database lacks GDP TL3 data for the United States, Canada, Mexico and Australia, and for the case of Japan and Korea we are currently developing the extended OECD typology. Our time converge is over the period 1995-2007. In essence we are measuring for absolute convergence over the 12 year period.

The analysis is presented in Table 1.A2.1 and reveals no statistical evidence of urban regions entering into a process of convergence or divergence. However, it does confirm that rural regions have experienced convergence over the period 1995-2007. The process of convergence is *stronger* among rural regions than among intermediate regions.

Table 1.A2.1. **Beta convergence in urban, intermediate and rural TL3 regions, 1995-2007**

	Model 1 urban regions	Model 2 intermediate regions	Model 3 rural regions
GDB *per capita* 1995	0.00000003	-0.00000046	-0.00000055
	[0.78]	[-3.60]**	[-5.24]**
F-value	0.08	12.98	27.47
Observations	233	295	322
R-squared	0.0003	0.0424	0.0791

Note: Absolute value of t statistics in brackets * significant at 5%; ** significant at 1%.

Source: OECD Regional Database (2010).

Annex 1.A3

How do regions contribute to OECD growth?

This annex benchmarks regional performance with respect to its country and to the OECD. The extra dimension allows us to better assess the performance of regions. For instance a catching up region growing faster than the national average might either be driven by its own buoyant growth rate, or by a decline in a few large regions that is bringing the national average downwards faster than in the lagging region. Introducing the OECD benchmark can differentiate between the two cases. This also helps us focus our attention on the growth dynamics of each individual region, without the data being dominated by overall national performance.

The extra benchmark adds complexity to the grouping structure. Comparing a region's initial levels of GDP *per capita* (e.g. for 1995) and its growth rate over the period 1995-2005 to national and OECD standards gives rise to 16 possible combinations of groups (Table 1.A3.1).

For example, Group 1 in Table 1.A3.1 includes all OECD TL2 regions with an initial GDP *per capita* that was below the national *and* OECD average and a GDP *per capita* growth rate between 1995 and 2005 that was below the national *and* OECD average.

Table 1.A3.1. **Regional categories according to performance against national and OECD averages, 1995-2007**

		GDP *per capita* growth			
		Above country average and above OECD average	Above country average and below OECD average	Below country average and above OECD average	Below country average and below OECD average
1995 GDP *per capita*	Below country average and below OECD average	(Group 1)	(Group 2)	(Group 3)	(Group 4)
	Below country average and above OECD average	(Group 5)	(Group 6)	(Group 7)	(Group 8)
	Above country average and below OECD average	(Group 9)	(Group 10)	(Group 11)	(Group 12)
	Above country average and above OECD average	(Group 13)	(Group 14)	(Group 15)	(Group 16)

Source: OECD Regional Database (2011).

Table 1.A3.2 shows how the OECD regions are distributed across each of the 16 groups, and Table 1.A3.3 displays the contribution of each growth to OECD GDP growth. Group 4 is the most numerous group, accounting for 20% of OECD TL2 regions. This means that about one-fifth of OECD TL2 regions have a potential to catch up and growth rates below both national and OECD averages. In contrast, Group 7 is the smallest group, containing only one region (Västsverige in Sweden).

The largest contribution to national growth was made by Group 8: regions with initial levels of GDP *per capita* that were above both the country and OECD average, and that were growing faster than their countries but slower than the OECD average. This group of regions contributed to 18% of OECD growth overall. The second largest contribution came from Group 4 regions: with GDP *per capita* levels and growth rates above the national and OECD average. This group contributed to 15% of overall growth.

Table 1.A3.2. **How OECD regions compare with national and OECD averages, 1995-2007**

		GDP *per capita* growth			
		Above country average and above OECD average	Above country average and below OECD average	Below country average and above OECD average	Below country average and below OECD average
1995 GDP *per capita*	Below country average and below OECD average	11% (35)	11% (37)	7% (22)	20% (64)
	Below country average and above OECD average	3% (11)	5% (15)	0% (1)	10% (31)
	Above country average and below OECD average	4% (13)	2% (6)	2% (7)	5% (16)
	Above country average and above OECD average	6% (21)	4% (14)	1% (3)	9% (29)

Source: OECD Regional Database (2011).

Table 1.A3.3. **Contribution to OECD growth by the 16 categories of TL2 regions, 1995-2005**

		GDP *per capita* growth			
		Above country average and above OECD average	Above country average and above OECD average	Above country average and above OECD average	Above country average and above OECD average
1995 GDP *per capita*	Below country average and below OECD average	(Group 1) 4.4%	(Group 5) 6.0%	(Group 9) 1.3%	(Group 13) 7.4%
	Below country average and below OECD average	(Group 2) 8.6%	(Group 6) 5.6%	(Group 10) 0.2%	(Group 14) 9.5%
	Below country average and below OECD average	(Group 3) 5.3%	(Group 7) 0.6%	(Group 11) 2.1%	(Group 15) 1.0%
	Below country average and below OECD average	(Group 4) 15.4%	(Group 8) 17.6%	(Group 12) 1.6%	(Group 16) 12.3%

Note: The contribution of each group to national growth depends on the growth rate of each region in the group and their relative size. The OECD contribution is a weighted average of all OECD countries where the weights are the relative size of countries computed by their GDP share in 2005.

Source: OECD Regional Database (2009).

Chapter 2

What are the key growth factors? The theory

This chapter investigates how less-developed regions can catch up to national average GDP per capita*. It focuses on identifying and analysing the main factors responsible for growth − and the main bottlenecks − for regions at different levels of development. It bases the analysis on five factors for growth: infrastructure, human capital, labour market, innovation, agglomeration and connectivity, and productivity. A first key finding of this analysis is that growth tends to follow simultaneous gains in several areas, such as human capital, infrastructure and innovation, rather than just one of these factors being responsible. This emphasises the importance of a multidimensional policy approach and the benefits of enhancing areas of complementarity, rather than tackling individual sectors in isolation. A second key message is that human capital is very important for boosting regional growth in all types of regions. And finally, growth dynamics vary with levels of development; they are not the same for underdeveloped regions as for advanced regions.*

Introduction

Regional performance is driven by a combination of interconnected factors that include geography, demography, specialisation, productivity, physical and human capital, infrastructure and the capacity to innovate, just to mention a few (OECD, 2009a). These regional factors vary from region to region, reflecting the fact that each region is unique.[1] This means that place-based policies will necessary differ from region to region. Analysis that can identify drivers of growth in regions with common levels of development can help provide general guidelines for designing place-based polices to boost regional performance. This chapter focuses on identifying and analysing the main factors responsible for growth, and the main bottlenecks, in different levels of development.

Our analysis uses the three categories described in Chapter 1 (CUP, LCUP and advanced regions). It applies two distinct techniques. The first involves comparing data and indicators to identify common factors present in dynamic regions and absent in less dynamic ones (see the section on analysing the causal factors of growth). We then use regression analysis to estimate the causal factors responsible for growth in each of the three categories (see the section on growth scenarios). Finally, we simulate several scenarios for understanding the implications for aggregate growth if these regions had improved by 10% in several key factors for growth.

Comparing the indicators of growth

Drawing on previous OECD work, we have identified the following factors that are relevant for regional growth (OECD, 2009a):

- **Infrastructure**: infrastructure has a positive impact on regional growth when other key factors are in place, such as human capital and innovation.
- **Human capital:** the absence of workers with only primary education and the presence of workers with tertiary education have a positive impact on regional growth.
- **Labour market:** labour-force activation[2] can have a positive impact on regional growth.
- **Innovation**: innovation can have a positive impact on long-run (ten years or more) growth.
- **Agglomeration and connectivity**: agglomeration has a positive, albeit weak, effect on regional growth.
- **Productivity**: measured as GDP per employee.

To compare these factors we must first identify measurable indicators for each. We have used criteria from previous OECD studies (OECD, 2009a, 2009b) to assess the main determinants of regional growth. Table 2.1 matches the five growth factors with the indicators used to measure them.

Table 2.1. **Growth factors and indicators used in the analysis**

Factor	Indicators
Productivity	*GDP to employment at place of work.*
Infrastructure	*Motorway density*: measured by kilometres of motorways to population.
Human capital	*Primary attainment* rate*:* the share of the labour force with primary education. *Tertiary attainment* rate*:* the share of the labour force with tertiary education. *PISA*[1] *scores* in mathematics and reading.
Labour market	*Employment rate:* the proportion of the working age population employed. *Unemployment rate:* the proportion of the labour force unemployed. *Youth unemployment rate:* the proportion of the labour force aged 15-24 unemployed. *Long-term unemployment rate:* the proportion of the labour force out of work and looking for work for 12 months or more. *Participation rate:* the ratio of the labour force to the working age population (15-64 years).
Innovation	*Patent intensity:* patent applications per million inhabitants. *Co-patenting applications and co-inventions*[2] within the region, within the country and with foreign countries: see Annex 2.A2 for more details. *Business R&D (BERD) to GDP:* R&D expenditures by the business enterprise sector as a proportion of GDP. *Government R&D (GERD) to GDP:* R&D expenditures by the government sector as a proportion of GDP. *Higher education (HED) R&D to GDP:* R&D expenditures by the higher education sector as a proportion of GDP.
Agglomeration and connectivity	*Population density:* population per square kilometre in surface land area. *GDP density:* GDP per square kilometre in surface land area. *Degree of openness:* the extent to which a region is open to inter-regional technological collaborations (see Annex 2.A2 for details). *Clustering coefficient:* the extent to which a region is connected to other regions (Annex 2.A2). *Centrality:* how central a region is in the global inter-regional innovation network (Annex 2.A2).

Notes: 1. PISA: the Programme for International Student Assessment (PISA) is a worldwide evaluation in OECD member countries of 15-year-old school pupils' scholastic performance, co-ordinated by the OECD.
2. Collaboration between business (companies) and non-business organisations (government, universities or hospitals) when there is a least one business applicant and one public applicant. Co-patents can be defined by location: within region, within country (outside region) and foreign (outside country).

Although static comparisons do not reveal any causal relationship, they highlight common elements present in the growing group of regions and absent in the underperforming group. Table 2.2 divides OECD regions into three groups according to the previous taxonomy based on levels of GDP *per capita* at the start of the period under study (i.e. in 1995). LCUP regions are defined as those with *per capita* GDP at or below 75% of the national average that year; advanced regions are those with above-average levels of GDP *per capita*; and CUP regions are those in between – that is, those between 75 and 100% of the national average level of GDP *per capita*. Each of these three groups is then divided into two sub-groups based on growth performance over the period in question – those that were losing ground (growth below the national average) and those that were growing at the national average or better.

Table 2.2. **Average value of main growth indicators for the six types of TL2 regions**

Relative to national averages, 1995-2007

		Below 75% of average GDP *per capita* (LCUP)		75-100% of average GDP *per capita* (CUP)		Above average GDP *per capita* (advanced)	
Growth factor	Indicator	Above average growth	Below average growth	Above average growth	Below average growth	Above average growth	Below average growth
Productivity	Productivity (GDP per employee)	31 612	29 728	55 832	50 728	72 551	59 824
Infrastructure	Motorway density	0.15	0.13	0.26	0.18	0.19	0.24
Human capital	Primary educational attainment (% of LF)	42%	46%	26%	22%	25%	29%
	Tertiary attainment (% of LF)	21%	19%	26%	25%	31%	26%
	PISA score mathematics	443	405	476	487	484	478
	PISA score reading	459	436	482	485	490	465
Labour market	Employment rate	57%	55%	71%	68%	71%	66%
	Unemployment rate	9%	8%	5%	7%	5%	6%
	Long-term unemployment rate	4%	5%	2%	2%	2%	2%
	Youth unemployment rate	21%	22%	13%	16%	12%	15%
	Participation rate	62%	60%	73%	72%	74%	69%
Innovation	ln (patent application)	1.7	1.8	4.4	4.1	5.0	4.0
	Patent intensity (applications per million)	20	16	91	74	158	82
	ln (patent application co-patents)	1.1	1.6	4.0	3.6	4.6	3.6
	Co-patents within region	124	90	673	536	2932	1256
	Co-patents within country	105	71	294	261	759	466
	Co-patents foreign	16	53	126	112	314	206
	R&D expenditure total (as % of GDP)	1.06%	1.03%	1.50%	1.41%	2.21%	1.51%
	BERD % GDP	0.35%	0.42%	0.90%	0.86%	1.35%	1.00%
	GERD % GDP	0.33%	0.22%	0.23%	0.20%	0.42%	0.16%
	High and medium HTM % employment	3.3%	4.8%	5.2%	6.1%	5.3%	6.4%
	KIS (as % of total employment)	22.5%	28.2%	33.3%	32.8%	36.7%	32.2%
Agglomeration and connectivity	Population density	17.51	18.38	19.40	18.63	29.47	23.41
	GDP density	1.10	0.99	4.29	3.38	29.14	24.19
	Degree of openness	14	15	40	40	65	44
	Clustering coefficient	0.034	0.038	0.089	0.093	0.123	0.084
	Centrality	0.001	0.001	0.002	0.002	0.007	0.005
Observations		37	15	61	103	54	55

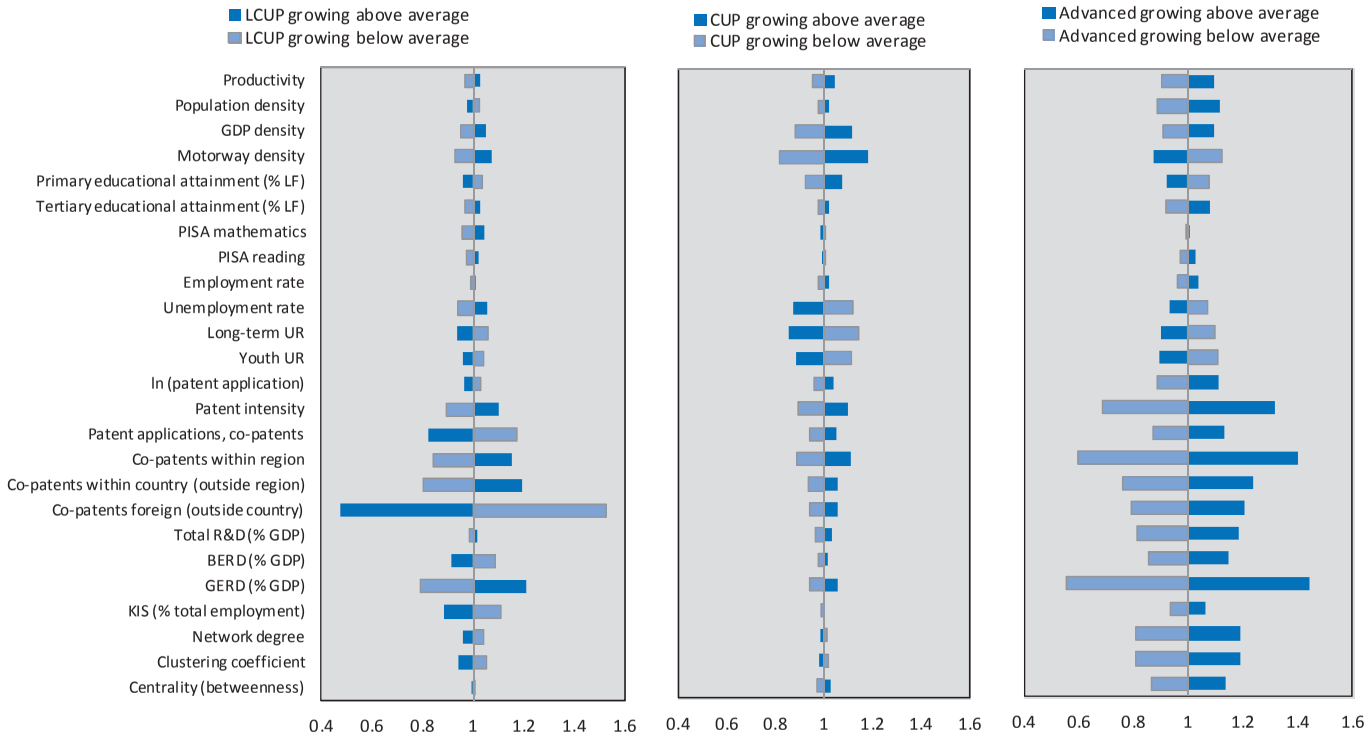
Notes: HTM = high-tech manufacturing; KIS = knowledge-intensive services; LCUP = large catching up potential; CUP = catching-up potential.

Source: OECD Regional Database (2011).

The analysis first benchmarks the sub-groups of regions against these variables (Table 2.2 and Figure 2.1). Comparisons across the three broad categories confirm a number of well known regularities. For example, levels of income and productivity *per capita* tend to be higher in more densely populated places, as do educational attainment rates and indicators of innovation activity. However, more densely populated regions do not enjoy any obvious advantage in terms of performance: over 70% of regions in the least advanced group (in terms of income levels) recorded above-average growth rates. This suggests some forces of convergence are at work.

By contrast, the proportion of fast-growing regions is smallest in the group of regions with CUP (37%) which suggests that converging regions may be confronted with particular challenges as they move closer to the frontier. It is striking that leading regions were about as likely as not to grow at above-average rates (the split was 54/55), a fact that points to the limits of convergence.

Figure 2.1. **How growing and underperforming TL2 regions compare across indicators of growth, 2007**



Note: The value 1 is the average value of LCUP regions, CUP regions and advanced regions respectively.

Source: OECD Regional Database.

Figure 2.1 compares the average values in 2007 of the indicators mentioned above for growing and underperforming regions in all three stages of development.

Nevertheless, the more interesting observations are those that emerge from the benchmarking the two subgroups within each of the three main groups – in essence, benchmarking the faster-and slower-growing regions at each level of development against one another. A comparison of indicators between more and less dynamic regions at each of the three levels of development suggests the following:

- Less developed regions with above-average growth appear to have (relative to their under-performing peers) somewhat higher productivity, higher density of GDP (but not population), slightly higher infrastructure density and better human capital, as reflected in the PISA scores. These scores suggest that the quality of education in such regions may be higher, implying that the differences in attainments may understate the real gap in human capital endowments. The difference between population and GDP density is striking and underlines the fact that there is more to economic agglomeration economies than just packing people together. Surprisingly, faster-growing regions tend to have slightly higher unemployment, perhaps because they tend to attract labour or because growth is associated with structural changes that leave some segments of the labour force struggling to adjust. These hypotheses would at least be consistent with the observation that participation and employment rates are higher in such regions, and both long-term and youth unemployment are slightly lower. Finally, regions in the growing sub-group report rather higher patenting and co-invention activity, even though R&D expenditure is much the same for the two sub-groups. The numbers, though, are small, even when adjusted for population.
- Intermediate regions with CUP with above-average growth also have higher productivity, higher density of both GDP and population (though the latter difference is far greater), and greater infrastructure density, which may also reflect the fact that the fast-growers are characterised by significantly greater accessibility to markets even though the region's degree of connectivity to global networks is about the same for both sub-groups. The growing group is associated with better labour market outcomes. The faster growing regions in this group are also engaged in more innovative activities, including more patents in both relative (intensity) and absolute terms, more co-patenting, more co-inventions (within the region and the country, and with foreign actors), despite the fact that total R&D expenditures are only slightly higher. Surprisingly, the slower growing regions are characterised by better average values on most human capital variables, except the proportion of high-skilled workers in the labour force, which suggests that other factors are somehow impeding effective deployment of their talent pools.
- The most striking feature of the third group is that faster growing leading regions score far better than their under-performing peers on virtually all innovation-related indicators, and the gaps between growing and under-performing subgroups are larger than in the other two groups.
- However, the faster growing regions have somewhat lower employment in high-tech manufacturing, albeit far higher employment in knowledge-intensive services. Infrastructure density also matters less in leading regions; the growing advanced regions are more productive, have much higher density of GDP and somewhat higher density of population (but not infrastructure) and better labour market outcomes. The rather lower density of infrastructure in such regions may point to diminishing returns to infrastructure investment. They also have a smaller share of the workforce with very

low educational attainments. Finally growing regions are more open to inter-regional technological collaborations, are better connected within a highly connected cluster of nodes and are more central in the global inter-regional innovation network.

In sum, the differences between fast-and slow-growing regions vary significantly across levels of development. Among the less developed regions, those growing faster than the national average appear to have more infrastructure, better human capital and higher density of activity relative to the under-performing group. As regions move into higher levels of development, infrastructure investment becomes relatively more significant, as does labour-force activation. Finally, among regions close to the productivity frontier, it is innovative activity – not only through public R&D expenditures but also through private R&D spending and patenting activity – that stands out. Among advanced regions, those growing faster also appear to have fewer individuals with very low levels of human capital and higher levels of labour-force activation. It is noteworthy that the faster-growing regions in each group are more productive, implying that factors favouring convergence within groups are weak.

Analysing the causal factors of growth

In this step our sample of regions is split into three categories using the taxonomy from the previous section – regions with a LCUP, regions with a CUP and advanced regions – in order to estimate the main factor of growth in each of the three stages of development. The unit of analysis is OECD TL2 regions and the data cover 1995-2007.

The regression results and methodological details are provided in Annex 2.A1, but they can be summarised as follows:

LCUP regions

- Lower-income regions within the group tend to grow faster, other things being equal, implying that there is a process of income convergence within this group. However, the forces of convergence do not appear to be strong
- Human capital has a positive impact on growth. Strikingly, it appears that the most important effects are observed at the bottom of the skill distribution: the negative impact of a large share of the workforce with very low skills appears to be a more important factor than the positive impact of a large share with tertiary qualifications. This result has important policy implications.
- Population density is not associated with higher growth, reinforcing the impression created by the benchmarking exercise that there is more to generating agglomeration economies than simply putting large numbers of people in close proximity to one another.
- Regions with low employment rates can generate growth by increasing labour-force participation.

CUP regions

As regions move to higher levels of development new growth dynamics emerge. For intermediate regions, the regression exercise generates the following key results:

- Human capital – measured in terms of both the absence of workers with no more than primary attainment in the labour force and the presence of workers with tertiary attainment – has a positive impact on growth.
- Mobilisation of the labour force brings growth in intermediate regions.
- Some innovation-related indicators appear to have an impact on growth in certain models (e.g. business R&D and government R&D expenditures in model 6 in the pooled specification), but the results are not stable.

Advanced regions

The most robust regression results for leading regions suggest that:

- Conditional convergence is weaker among leading regions than among intermediate regions. This is not surprising, as Table 2.2 above suggests that agglomeration economies play a larger role in leading regions, and agglomeration economies tend to work against convergence. The logic of agglomeration would lead one to expect divergence of regional performance over time, with the leading regions pulling further ahead. So the results for this group reflect the contradictory impact of the forces of convergence and agglomeration.
- In the most advanced regions, infrastructure density is not a key factor. That is what one would expect if infrastructure investment exhibited diminishing returns. Advanced regions would tend, on the whole, to have good connective infrastructure already.
- Human capital has a positive impact on growth. Again, it is the share of individuals with very low skills that is significant in every model, suggesting the degree to which large groups of unskilled or low-skilled workers can act as a drag on growth.
- Innovation variables were significant in most models but their performance changed considerably from one model to another.

In sum, the regression results are broadly, albeit not perfectly, consistent with the results obtained in the benchmarking exercise.

- They reinforce the conclusion that the main factors supporting or constraining growth vary considerably among regions at different levels of development.
- The regression results also underscore the importance of human capital for all types of regions, though it is striking that the presence of large numbers of people with little human capital appears to weigh more on the results than the number with tertiary qualifications. Addressing the plight of the low-skilled may matter more for growth than policies aimed at expanding higher education.
- Evidence of the importance of innovation-related activities is far less clear-cut in the regression results than it appeared to be in the benchmarking. Innovation variables were significant in many models but changes in model specification often affected their performance, making it hard to assert robust conclusions. The relationship between innovation and growth is complex and depends on a number of other factors, some of which are discussed in Box 2.1.

Box 2.1. **The innovation puzzle**

The regression results provide little support for a link between innovative activities and regional growth. This may seem a somewhat surprising finding, in view of the extensive evidence that exists concerning the importance of innovation for growth. Not only technological, but also organisational, financial and institutional innovations have been shown to be important for long-term growth.

There are a number of factors that may account for this apparent paradox:

- The indicators employed cover forms of innovation activity that are oriented towards cutting-edge, science-based innovation, which is typically concentrated in advanced urban centres.* Thus, it is hardly surprising that innovation-related variables are significant (when they are significant at all) only in the regressions for leading regions. This is consistent with the view that research and technological innovation should matter more as regions approach the productivity frontier. For regions further from the frontier, a strategy of technology absorption/adoption rather than innovation – i.e. borrowing and employing technologies from more advanced regions – may make more sense.

- The indicators used here are unlikely to capture a great deal of innovation activity in less dense regions (especially predominantly rural ones), where innovations are more likely to involve incremental changes to production processes and local adaptations of established technologies than patentable inventions, new products and the like.

- The kinds of cutting-edge innovation these variables tap into need not generate growth where the R&D takes place or the patents are generated. Innovative activities generate positive spillovers – that is one of the major reasons for promoting them. Faster diffusion of innovations is likely to be good for aggregate growth but also to spread the impact of innovation over a wider area. This is true even at national level, and it is likely to be even more apparent at the level of regions. Thus, there is no necessary contradiction between the fact that innovation is both *i*) important for growth and *ii*) a decidedly place-based activity and the recognition that we do not find a clear link between local innovation and local growth.

- Closely linked to the above is the recognition that innovation and entrepreneurship are linked. A lack of entrepreneurs to make the market breakthroughs happen will greatly reduce the productivity and other gains that a given place can expect from its innovative activities.

The foregoing considerations point to the need for great care in the design of both "smart specialisation" strategies and innovation performance indicators for the great majority of regions. Promoting "softer" forms of innovation is likely to matter more, but such innovations are even harder to anticipate, let alone measure, than those of the science/technology variety. The importance of public innovation funding for specific regions is also open to question. This is not to deny the importance of innovation in the broadest sense of the term for all types of regions. However, given limited resources, the issue confronting policy makers is what share of public spending it makes sense to devote to the research sector in different kinds of regions. Policies to promote human capital formation and entrepreneurship, for example, may do more to foster new activities and productivity growth than comparable investments in the R&D sector in many regions.

Note: * Since "big science" often benefits both from economies of scale (large fixed capital costs) and from agglomeration economies (interactions among researchers), this concentration is likely to be good for innovation performance. How can declining regions turn themselves around?

Growth scenarios: Simulating their impact on aggregate growth

This section presents two policy simulations using the regression results from the previous section. We model the following scenarios:

- A 10% improvement in human capital for CUP, LCUP and advanced regions.
- A 10% increase in business and government R&D expenditures for CUP regions.

The purpose is twofold: one the one hand to estimate the impact on GDP *per capita* growth rates and on the other the impact on aggregate GDP growth.

Simulation 1: Increasing human capital by 10%

The analysis in the preceding sections highlights the importance of human capital for regional growth in all types of regions. The first simulation measures the impact on regional GDP *per capita* growth and on aggregate GDP growth when improving the human capital stock in the regions. We simulate this by increasing and decreasing the stock of high and low-skilled workers − measured by primary and tertiary attainment rates − in the labour force by 10%. The simulations apply the following steps:

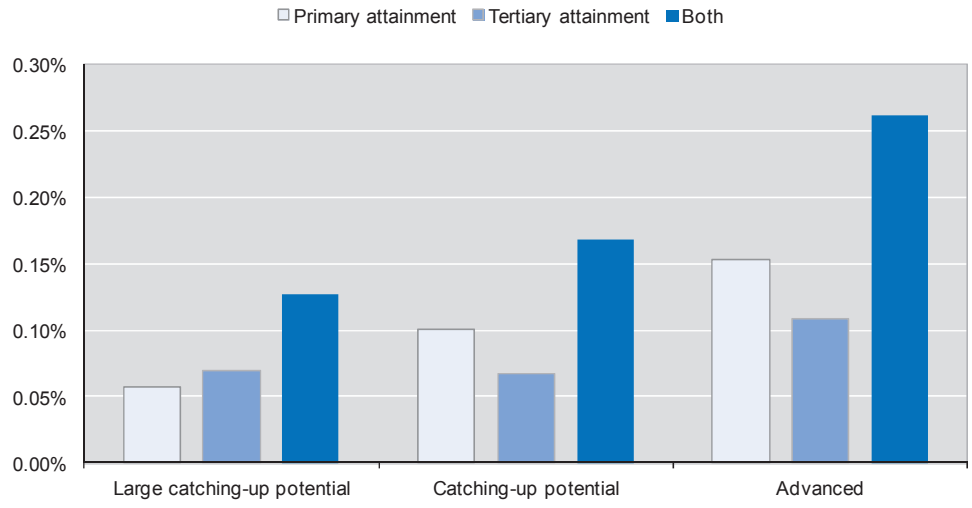
- To define our baseline scenario we used the regression coefficient estimated by model 4 in the pooled specification (Annex 2.A1) to compute the predicted 2008 GDP *per capita* growth rate for each region. This provides us with the predicted benchmark growth rate.
- We simulated a 10% increase (and decrease) in each region's 2007 tertiary (and primary) attainment rates in order to compute the predicted 2008 GDP *per capita* growth rate for each region. We then compare the difference with the baseline growth rate for each region and average all value to obtain the impact of our simulation GDP *per capita* growth.
- To estimate the impact on aggregate growth, we multiplied the predicted 2008 GDP *per capita* growth rate when increasing the proportion of high-skilled workers and reducing low-skilled workers by 10% simultaneously with the 2008 population for each region to obtain the predicted GDP value for 2008.

The results of the simulations (Figure 2.2) suggest that a 10% improvement in primary and tertiary attainment could increase annual *per capita* growth rates on average in advanced regions by one-quarter (0.26) of a percentage point; in CUP regions by 0.17 percentage points and in LCUP regions by 0.13 percentage points. When comparing the effects of increasing high skilled labour and reducing low skilled labour by the same proportion, it is interesting to observe the greater impact by the latter when reducing the proportion of the workforce with low skills in CUP regions and in advance regions. This confirms the drag effect on growth of a large population of very low-skilled workers. Policies to address the plight of the low skilled may thus be as important, or even more, for growth as policies aimed at expanding higher education.

The impact of a 10% improvement in human capital (both increasing the proportion of high-skilled workers and reducing low-skilled workers by 10%) on aggregate growth would be highest in advanced regions (Table 2.3). This result is not surprising given that advanced regions are already the largest contributor to aggregate

growth. The increase in their contribution would surge from their current contribution of 53% to almost 57%. A 10% increase in CUP regions would increase their contribution to growth from 39.6% to 41.3%, which is a considerable amount.

Figure 2.2. **Impact on growth rates of a 10% improvement in human capital in LCUP, CUP and advanced regions**



Note: LCUP are regions with large catching-up potential. CUP are regions with catching-up potential.

Source: OECD Regional Database.

Table 2.3. **Impact on aggregate growth by a 10% improvement in human capital**

	Benchmark model (overall growth contribution)	10% increase in human capital (overall growth contribution)
Large catching-up potential (LCUP)	5.3%	5.4%
Catching-up potential (CUP)	39.6%	41.3%
Advanced	53.3%	56.7%

Note: The simulation computes a simultaneous improvement in increasing tertiary attainment rates by 10% and reducing primary attainment rates by 10%.

Source: OECD Regional Database.

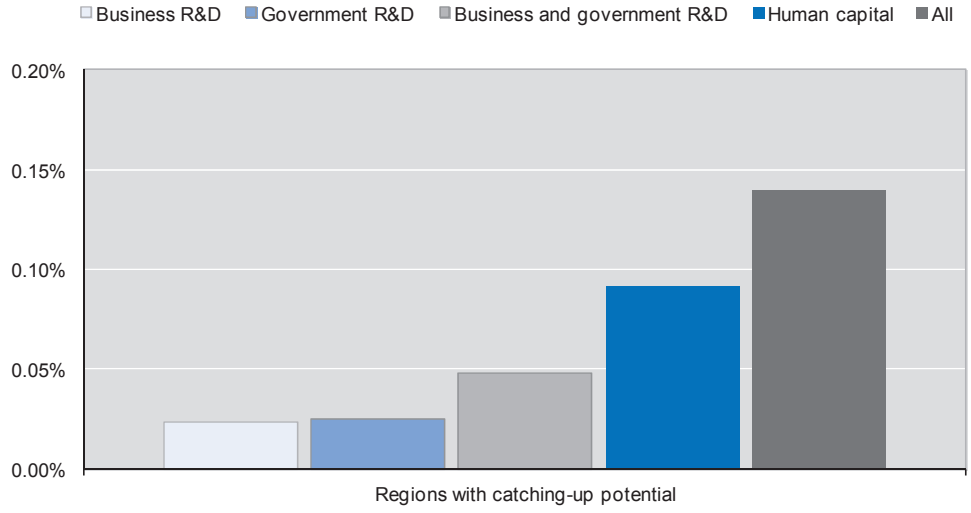
Simulation 2: Increasing business and government R&D by 10% in CUP regions

The second simulation estimates the impact of a 10% increase in business and government R&D expenditures in CUP regions and compares the effects of this simulation to an increase of 10% in human capital on yearly average growth rates. We apply the simulation only to CUP regions since *i*) their large growth potential due to the large number of regions in this category and *ii*) because the estimated coefficients are all statistically significant in CUP regions. This simulation follows the same procedure as the previous simulation and makes use of the regression coefficients estimated by model 6 of the pooled specification which found all four coefficients – business/government R&D

expenditures and primary/tertiary attainments – to be statistically significant (Annex 2.A1).

The results in Figure 2.3 show that increasing business R&D expenditures by 10% would have a similar impact on average growth as increasing government R&D expenditures by 10%. When both elements are increased simultaneously (by 10%), the model suggests that average annual growth rates in CUP regions would increase by 0.05 percentage points. This is about one-third of the impact of improving tertiary and primary attainments by 10% (a 0.17 pp increase). In essence, it seems that the impact of human capital on the growth rate of CUP regions is twice as large as the impact of R&D expenditures. When all three elements are improved by 10% – business and government R&D expenditures *and* primary/tertiary attainment rates – the model suggests that annual average growth in CUP regions could increase by 0.14 percentage points.

Figure 2.3. **Impact on aggregate growth of a 10% improvement in R&D expenditures and in human capital in CUP regions**



Source: OECD Regional Database.

To sum up, the work presented in this chapter tells us that:

- Growth dynamics vary significantly with a region's level of development. The impact of infrastructure on regional growth is very different in underdeveloped regions than in advanced regions; likewise the impact of innovation activities in science and technology also varies considerable between advanced regions and underdeveloped ones. This suggests that "one size fits" all polices might miss their target.
- Human capital is very important for boosting regional growth in all types of regions, especially reducing the proportion of the workforce with lower skills. Improving the proportion of high skilled workers also contributes positively to growth despite the fact that some highly skilled workers will inevitably leave poorly endowed regions (brain drain) in search of better opportunities elsewhere. The evidence suggests that despite these forces, improving human capital pays off to regions, including the less developed regions.

- An integrated approach, whereby several factors for growth are targeted simultaneously, can pay off. For example, infrastructure improvements can have a positive impact when other factors are also present in a region, such as strong human capital, robust employment rates and good innovation rates. Furthermore this integrated approach also varies with the level of development in regions.

Notes

1. Some factors are common to all regions in a country − for instance, growth will tend to be higher in all regions of a country at the peak of its business cycle than in a country in recession; sound macroeconomic policies will result in faster regional growth across the board; and as observed during the recent global financial crisis, global and international forces have a strong influence on the performance of all regions.
2. Labour force activation is a general term which includes both unemployment rates and workforce participation rates. Policies related to labour force activation focus on improving skills and competences, matching supply and demand better and so on, rather than just focusing on reforming labour markets in terms of wages.

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Annex 2.A1

Regression analysis: Methodology

Step two of the analysis in Chapter 2 uses regression analysis. The first part of the analysis compares a wide range of indicators associated with regional growth to identify common elements present in the more dynamic regions and absent in the less dynamic regions. Regression techniques allow us to deepen the analysis and measure causal effects. In other words whether the factors for growth we identified have a positive effect, a negative one or no statistical effect on regional growth. It allows us to discriminate between correlation effects and causation effects. For our regression analysis we construct a regional model for growth using a similar theoretical framework employed in previous models (see OECD, 2009a). The regression analysis estimates the coefficients of the model. Our model considers elements from the neoclassical literature, the endogenous growth theory and the new economic geography and takes upon the following specification. Regional GDP *per capita* is estimated through the following reduced functional form:

$$\ln\left(\frac{GPDpc_{i,t}}{GDPpci_{t-1}}\right) = \alpha + \beta_1 \ln\left(Initial Y_{i,t-1}\right) + \beta_2 \ln\left(Infrast_{i,t-1}\right) + \beta_3 \ln\left(Prim Ed LF_{i,t-1}\right) + \beta_4 \ln\left(Tert Ed LF_{i,t-1}\right)$$
$$+ \beta_5 (Emp Rate_{i,t-1}) + \beta_6 \ln(Pop Density) + \beta_7 \left(Patent Intensity_{i,t-1}\right) + \beta_8 \ln\left(BERD\_GDP_{i,t-1}\right)$$
$$+ \beta_9 \ln\left(GERD\_GDP_{i,t-1}\right)\beta_{10} \ln\left(Degree_{i,t-1}\right) + \beta_{11} \ln\left(Clustering_{i,t-1}\right) + \beta_{12} \ln\left(Centrality_{i,t-1}\right) + \gamma_j CD_j + \varphi_t TD_t + u_i + e_{i,t}$$

Yearly regional growth of GDP *per capita* is regressed on:

- $Initial\ Y_i$ = initial GDP *per capita*
- $Infrast_i$ = motorway density defined by kilometres of motorway to population
- $Prim\ Edu\ LF_i$ = stock of labour force with only primary educational attainment
- $Tert\ Edu\ LF_i$ = stock of labour force with tertiary educational attainment
- $Empl\ Rate_i$ = employment rates
- $Population\ Density_i$ = population per square kilometre
- $Patent\ Intensity_i$ = patent applications per million inhabitants
- $BERD\_GDP_i$ = business R&D expenditures as a proportion of GDP
- $GERD\_GDP_i$ = government R&D expenditures as a proportion of GDP

- $Degree_i$ = number of interregional links measured by co-patents which connect region *i* to all other regions (see Annex 2.A2 for more information).

The analysis estimates the functional form given by equation 1 using a cross sectional **pooled model** and a **panel model** specification. Panel data analysis concerns regression analysis capable of accounting for both a spatial and temporal dimension. The spatial dimension in our case refers to TL2 regions, also called cross-section, and the temporal dimension to years. The panel specification measures the yearly impact of the independent variables on growth, controlling for group specific effects and time effects. Although most of the time there are either cross-sectional or temporal effects, there are occasions when neither of these is statistically significant. The model is sometimes called the pooled regression if neither of these is statistically significant. The panel model uses either the fixed or random effects according to the results of the Hausman test. These are provided in the tables.

Table 2.A1.1. **Regression results, LCUP regions pooled and panel model, 1995-2007**

Pooled specification

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Initial Y *i* (GDP)	-0.00869	-0.00325	-0.00642	-0.00637	-0.0006	0.00471
	[2.93]**	[0.68]	[1.15]	[1.18]	[0.04]	[0.33]
Infrast *i*	0.0023	0.00379	0.0052	0.00092	0.00659	0.00242
	[0.33]	[0.67]	[0.80]	[0.14]	[0.89]	[0.31]
Prim Edu LF *i*		-0.00545	-0.00604	-0.00545	-0.01237	-0.01126
		[2.70]**	[2.48]*	[2.30]*	[2.54]*	[2.32]*
Tert Edu LF *i*		0.00375	0.0039	0.00734	0.01374	0.0175
		[1.65]	[1.51]	[2.73]**	[1.85]	[2.28]*
Empl Rate *i*			-0.00006	-0.00031	-0.00107	-0.00115
			[0.22]	[1.18]	[2.09]*	[2.27]*
Population Density *i*				-0.0001	-0.00013	-0.00012
				[3.45]**	[2.82]**	[2.58]*
Patent Intensity *i*					-0.00024	0.0001
					[1.05]	[0.34]
BERD_GDP *i*					0.00391	0.00636
					[0.88]	[1.37]
GERD_GDP *i*					-0.00351	-0.00522
					[0.88]	[1.28]
Degree						-0.00065
						[1.67]
Constant	0.12859	0.10002	0.13834	0.11533	0.11409	0.01253
	[4.79]**	[1.84]	[1.97]	[1.68]	[0.71]	[0.07]
Observations	466	211	190	190	95	95
R-squared	0.02	0.04	0.04	0.1	0.19	0.22

Panel specification

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Initial Y *i* (GDP)	-0.07827	-0.00204	-0.0045	-0.0045	0.01068	0.00801
	[4.66]**	[0.36]	[0.67]	[0.70]	[0.23]	[0.17]
Infrast *i*	0.21251	0.00431	0.0041	0.00064	-0.17179	-0.1676
	[3.09]**	[0.58]	[0.47]	[0.08]	[0.92]	[0.89]
Prim Edu LF *i*		-0.00529	-0.00555	-0.00512	0.00875	0.00843
		[1.90]	[1.73]	[1.68]	[0.29]	[0.28]
Tert Edu LF *i*		0.0032	0.00279	0.00562	-0.05066	-0.0515
		[1.02]	[0.79]	[1.59]	[1.85]	[1.86]
Empl Rate *i*			0.00013	-0.00009	0.00168	0.00174
			[0.40]	[0.29]	[0.98]	[1.01]
Population Density *i*				-0.00008	-0.00152	-0.0015
				[2.15]*	[0.64]	[0.62]
Patent Intensity *i*					0.00069	0.00066
					[1.56]	[1.43]
BERD_GDP *i*					0.00206	0.00202
					[0.22]	[0.22]
GERD_GDP *i*					-0.01346	-0.01356
					[1.03]	[1.03]
Degree						0.00021
						[0.32]
Constant	0.73465	0.09265	0.11663	0.0992	0.55267	0.58227
	[4.90]**	[1.39]	[1.37]	[1.21]	[1.00]	[1.03]
Fixed or random effect	fe	re	re	re	fe	fe
Hausman test	0	0.084	0.5964	0.4809	0.0233	0.0413
Observations	466	211	190	190	95	95
Number of regions	51	37	37	37	21	21
R-squared	0.05	0.05	0.02	0.02	0.1	0.11

Note: Absolute value of t statistics in brackets * significant at 5%; ** significant at 1%, LCUP regions are regions with a large catching-up potential.

Source: OECD Regional Database.

Table 2.A1.2. **Regression results, CUP regions pooled and panel model, 1995-2007**

Pooled specification

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Initial Y *i* (GDP)	-0.0099	-0.01275	-0.01235	-0.01355	-0.02114	-0.01809
	[4.64]**	[4.35]**	[3.65]**	[3.89]**	[4.27]**	[3.50]**
Infrast *i*	-0.00031	-0.00491	-0.00194	-0.00099	0.01066	0.00909
	[0.08]	[1.15]	[0.46]	[0.23]	[2.14]*	[1.81]
Prim Edu LF *i*		-0.011	-0.00975	-0.00957	-0.00641	-0.0058
		[7.13]**	[6.14]**	[6.01]**	[3.22]**	[2.88]**
Tert Edu LF *i*		0.00744	0.00685	0.00709	0.0023	0.0032
		[4.63]**	[4.13]**	[4.26]**	[0.91]	[1.25]
Empl Rate *i*			-0.00023	-0.00017	-0.00014	-0.00015
			[1.50]	[1.12]	[0.71]	[0.79]
Population Density *i*				0	0.00002	0.00003
				[1.40]	[2.12]*	[2.31]*
Patent Intensity *i*					-0.00007	-0.00006
					[3.23]**	[2.55]*
BERD_GDP *i*					0.00163	0.00244
					[1.47]	[2.07]*
GERD_GDP *i*					0.00237	0.00262
					[2.46]*	[2.70]**
Degree						-0.00013
						[1.95]
Constant	0.14305	0.21951	0.22097	0.22373	0.29855	0.24935
	[6.84]**	[8.00]**	[7.66]**	[7.74]**	[7.54]**	[5.32]**
Observations	1647	1052	910	910	590	590
R-squared	0.02	0.07	0.07	0.08	0.15	0.16

Panel specification

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Initial Y *i* (GDP)	0.00559	-0.02693	-0.0585	-0.06087	-0.04878	-0.05447
	[0.87]	[2.22]*	[4.23]**	[4.36]**	[2.53]*	[2.76]**
Infrast *i*	0.06376	-0.0663	-0.02651	-0.0192	-0.02261	-0.01789
	[2.10]*	[1.20]	[0.40]	[0.29]	[0.27]	[0.22]
Prim Edu LF *i*		-0.05035	-0.04058	-0.04061	-0.03648	-0.03665
		[8.94]**	[5.86]**	[5.87]**	[4.41]**	[4.44]**
Tert Edu LF *i*		0.0366	0.04034	0.04003	0.03225	0.03223
		[4.80]**	[3.98]**	[3.95]**	[2.27]*	[2.27]*
Empl Rate *i*			-0.001	-0.00104	-0.00223	-0.00217
			[2.41]*	[2.50]*	[3.19]**	[3.10]**
Population Density *i*				0.00017	-0.00045	-0.00054
				[1.18]	[0.84]	[0.99]
Patent Intensity *i*					0.00001	-0.00001
					[0.10]	[0.05]
BERD_GDP *i*					0.00408	0.0039
					[0.78]	[0.74]
GERD_GDP *i*					0.00568	0.0058
					[1.72]	[1.76]
Degree						0.00029
						[1.37]
Constant	-0.02426	0.49793	0.70815	0.70652	0.743	0.79608
	[0.40]	[4.07]**	[4.90]**	[4.89]**	[4.13]**	[4.33]**
Fixed or random effect	fe	fe	fe	fe	fe	fe
Hausman test	0.0001	0	0	0	0	0
Observations	1647	1052	910	910	590	590
Number of regions	162	154	147	147	112	112
R-squared	0.01	0.09	0.07	0.07	0.09	0.1

Note: Value of t statistics in brackets * significant at 5%; ** significant at 1%, CUP are regions with a catching up potential.

Source: OECD Regional Database.

Table 2.A1.3. **Regression results, advanced regions pooled and panel model, 1995-2007**

Pooled specification

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Initial Y *i* (GDP)	-0.00312	-0.00872	-0.00711	-0.00551	-0.00918	-0.00848
	[1.33]	[2.47]*	[1.83]	[1.30]	[1.45]	[1.34]
Infrast *i*	0.0049	0.00886	0.00909	0.00797	0.00732	0.00763
	[1.39]	[2.37]*	[2.51]*	[2.09]*	[1.71]	[1.79]
Prim Edu LF *i*		-0.01341	-0.01421	-0.01454	-0.01182	-0.01006
		[7.68]**	[7.93]**	[7.96]**	[5.08]**	[4.06]**
Tert Edu LF *i*		0.01046	0.01114	0.01134	0.00294	0.00402
		[6.51]**	[6.85]**	[6.91]**	[0.95]	[1.29]
Empl Rate *i*			-0.00042	-0.00048	0.00006	0.0001
			[2.39]*	[2.56]*	[0.23]	[0.42]
Population Density *i*				-1.26E-06	-5.97E-07	-1.16E-07
				[0.93]	[0.33]	[0.06]
Patent Intensity *i*					-0.00005	-0.00002
					[2.15]*	[0.81]
BERD_GDP *i*					0.00139	0.00162
					[0.66]	[0.77]
GERD_GDP *i*					0.00332	0.00366
					[2.15]*	[2.36]*
Degree						-0.00014
						[1.98]*
Constant	0.07448	0.16855	0.18062	0.17057	0.22663	0.18314
	[3.15]**	[4.57]**	[4.81]**	[4.36]**	[3.47]**	[2.81]**
Observations	1034	573	512	512	307	314
R-squared	0	0.1	0.13	0.13	0.16	0.2

Panel specification

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Initial Y *i* (GDP)	-0.02795	0.01138	-0.04292	-0.03882	-0.02689	-0.03055
	[3.15]**	[0.68]	[2.38]*	[2.11]*	[0.98]	[1.07]
Infrast *i*	0.17151	-0.14994	-0.24088	-0.24087	-0.07993	-0.07069
	[4.28]**	[1.67]	[2.56]*	[2.57]*	[0.68]	[0.59]
Prim Edu LF *i*		-0.05336	-0.05815	-0.0574	-0.03878	-0.03815
		[5.08]**	[5.31]**	[5.23]**	[2.75]**	[2.69]**
Tert Edu LF *i*		0.01497	0.0379	0.03817	0.00787	0.00674
		[1.41]	[3.37]**	[3.40]**	[0.53]	[0.45]
Empl Rate *i*			-0.00261	-0.00272	-0.00299	-0.00299
			[3.28]**	[3.38]**	[2.44]*	[2.44]*
Population Density *i*				-8.00E-05	-1.50E-04	-1.50E-04
				[1.05]	[1.43]	[1.40]
Patent Intensity *i*					0.0002	0.00019
					[2.16]*	[1.95]
BERD_GDP *i*					0.01651	0.01651
					[2.21]*	[2.21]*
GERD_GDP *i*					0.00386	0.0039
					[0.80]	[0.81]
Degree						0.00013
						[0.49]
Constant	0.29533	0.43098	0.96068	0.95837	0.86728	0.90042
	[3.34]**	[2.26]*	[4.82]**	[4.81]**	[3.22]**	[3.24]**
Fixed or random effect	fe	fe	fe	fe	fe	fe
Hausman test	0	0.0028	0	0	0.0004	0.0007
Observations	1647	1052	910	910	590	590
Number of regions	162	154	147	147	112	112
R-squared	0.01	0.09	0.07	0.07	0.09	0.1

Note: Value of t statistics in brackets * significant at 5%; ** significant at 1%.

Source: OECD Regional Database.

Annex 2.A2

Network analysis

For our analysis of innovation and connectivity factors, we consider inter-regional innovation networks (Ajmone and Primi, 2012). A network is an abstract representation of a set of interconnected objects. The interconnected objects are called nodes and the established connections among them are called links. In this analysis, each node of the network corresponds to a region (TL2 level) and each link corresponds to a proven co-patent collaboration between regions. For example, region A will be linked to region B if and only if there is at least a co-patent by inventors affiliated to A and B in a particular year. This may help to better understand how regions collaborate when dealing with innovation activities.

This approach allows us to measure connectivity related indicators, based on the social network approach briefly described above:

- The extent to which a region is open to inter-regional technological collaboration. **To measure this we use the degree of a node.** The degree k of a node i in a network is the number of links which connect node i to other nodes (the larger the degree the more "important" is a node, in our case the degree represents the total number of inter-regional connections a region has). The average degree is the average computed for all nodes of the network.
- The extent to which a region is connected to other regions. To measure this we use the **clustering coefficient** of the network. This measures the propensity of the network to create clusters. The clustering coefficient, C, can be formally defined as follows: for any node i one picks the k_i nodes linked to node i. If these nodes are all connected to one another (i.e. they form a fully connected clique), there will be $k_i(k_i -1)/2$ links between them. Denoting with K_i the actual number of links that connect the selected k_i nodes to each other, the clustering coefficient for node i is then defined as $C_i = 2K_i/k_i (k_i -1)$. The clustering coefficient for the whole network is obtained by averaging C_i over all nodes in the system. This tells us to what extent a node is within a highly connected cluster of nodes.
- The centrality of a region in the global inter-regional innovation network. To measure this we use the **between centrality** of a node. This is the proportion of all geodesics (shortest paths) between pairs of other nodes that include this node. It is a measure of how central is a node in the global structure of the network. Regions with a high between centrality measure are more central in the global inter-regional innovation network.

Chapter 3

Growth factors and bottlenecks: Lessons from 23 regional case studies

To increase our understanding of factors for growth and the bottlenecks hindering regional growth, this chapter supplements the theory of Chapters 1 and 2 with information from 23 OECD case studies. The case study regions are divided into two groups: i) *dynamic regions which over the last 12 years have caught up with the national average GDP per capita; and* ii) *less dynamic regions which have not yet caught up with the national average in GDP per capita. Each case study presents a snapshot of the region, an economic assessment, the key elements responsible for growth and the key bottlenecks. At the end of the chapter the main findings drawn from the 23 case studies are summarised. One of the key findings is the importance of an integrated policy approach to avoid the unintended consequences of isolated actions, which can trigger brain drain and other damaging phenomena. The research suggests some policy packages that should be implemented together, depending on the developmental stage of the region in question:* i) *regional growth policies, plus policies for building infrastructure and human capital;* ii) *strengthening infrastructure connectivity while creating a favourable business environment; and* iii) *strengthening institutions (e.g. good governance and leadership capacity) while promoting innovation.*

Introduction

Chapters 1 and 2 revealed there is a high potential for catching-up in non-urban regions with lower initial levels of GDP *per capita*. Realising this potential carries important policy implications at the national level. A policy focusing exclusively on the growth potential of big "hub" regions can miss its target by not accounting for the growth potential of all remaining regions. Broadly speaking aggregate growth follows a one-third/two-thirds rule. One-third of aggregate growth in a national economy is driven by a few big hubs (around 4% of TL2 regions and 2.4% of TL3 regions) and the rest of aggregate growth is contributed by the remaining two-thirds of the regions (OECD, 2011b; and see Figure 1.10).

This catching-up effect, however, is not automatic and is conditional on the endogenous factors in the regions (Chapter 2). In particular, regions with lower levels of development can become more dynamic by improving human capital. As regions move into higher levels of development, infrastructure, human capital, mobilisation of the labour force and innovation-related activities are critical factors for growth. In addition to the endogenous elements there is a large body of literature highlighting the important role institutions and policies play in the growth potential of regions and of countries (Acemoglu and Dell, 2010; Rodrik, 2008; Farole *et. al.*, 2011). The evidence however is not very exhaustive, mainly due to difficulties of measuring institutions and policies. To increase our understanding of these factors, in this chapter we supplement the theory of Chapter 2 with information from 23 case studies of OECD regions. These case studies will provide a better understanding of the key factors responsible for growth and the main bottlenecks.

Structure and selection of case studies

The selection of cases studies is not random. All the regions chosen have either catching-up potential (CUP) or large catching-up potential (LCUP). LCUP regions are defined as those with *per capital* GDP at or below 75% of the national average at the start of the period under study (i.e. in 1995); and CUP regions are those between 75 and 100% of the national average that year. They are divided into two groups: *i*) dynamic regions (those whose above average growth rates between 1995 and 2007 allowed them to catch up with the national average GDP *per capita*); and *ii*) less dynamic regions (whose below average growth rates over the 12 years has meant that they are still below national average GDP *per capita* levels). Our aim was to compare these two groups to find common factors likely to be promoting growth in the dynamic regions and preventing growth (bottlenecks) in the less dynamic ones. Our sample has almost equal numbers of each (12 dynamic regions and 11 less dynamic ones; see Table 3.1). Within these two groups, the specific regions chosen depended both on the willingness of regions to participate and interest by strategic partners[1] to fund the case studies in these regions.

The aim of the case studies is to identify the key drivers and bottlenecks of growth over the same time period (1995-2007) as the analysis in Chapters 1 and 2. The purpose is not to conduct a fully-fledged review of the region, or to derive causal relationships between polices and performance. Instead, using our taxonomy to classify regions as having caught up (dynamic) or not (less dynamic), the research has been able to focus on those policy initiatives and bottlenecks which have either

Table 3.1. **Case study regions**

Region	Category
Dynamic regions	
Aquitaine	CUP and growing above average
Asturias	CUP and growing above average
Brandenburg	LCUP and growing above average
Central Transdanubia	CUP and growing above average
Durango	CUP and growing above average
Jalisco	CUP and growing above average
Marche	CUP and growing above average
Midi-Pyrénées	CUP and growing above average
Sachsen-Anhalt	LCUP and growing above average
San Luis Potosi	LCUP and growing above average
Wielkopolskie	CUP and growing above average
Zuid-Nederland	CUP and growing above average
Less dynamic regions	
Chiapas	LCUP and growing below average
Estado de México	CUP and growing below average
Lubelskie	CUP and growing below average
Nord-Pas de Calais	CUP and growing below average
North East (Tyne and Wear)	CUP and growing below average
North West (Manchester)	CUP and growing below average
Podlaskie	CUP and growing below average
Sicilia	LCUP and growing below average
Východné Slovensko	CUP and growing below average
Yorkshire and Humberside (Leeds)	CUP and growing below average
Zacatecas	LCUP and growing below average

Note: LCUP are regions with large catching-up potential and CUP with catching-up potential.

supported or constrained growth. The goal is to identify and learn from interesting initiatives and best practices present in the group of regions that have caught up, as well as the important bottlenecks present in the group was has not yet caught up.

We followed the same methodology for all 23 case studies:

- A standardised questionnaire was sent to each of the 23 regions participating. The questionnaire was sent to an assigned counterpart from the regional government, who either filled in the questionnaire directly or circulated questions to different actors and experts in the region. The counterpart was responsible for collecting the information and sending back the completed questionnaires to the OECD.
- Field interviews structured around the questionnaire responses were held in each region.[2] During these, consultants and experts, along with OECD analysts, interviewed a sample of representative key stakeholders from the private sector, the academic community, NGOs, and regional and (some) national policy makers.
- After the interviews the OECD secretariat drafted the case studies for each case study region.

- The final step was to ask regional or national ministries to check and approve the draft case study report before final approval by the Territorial Development Policy Committee (TDPC) at the OECD.

The case studies aim to learn from interesting initiatives and best practice in the successful group of regions, as well as from common bottlenecks from the underperforming group. The questionnaires and interviews focus on the key elements driving growth, identified in the quantitative analysis from Chapter 2, as well as the role of polices and governance during the period of examination. The purpose of the case studies is not to carry out a full-scale review of the region or to derive causal relationships between polices and performance. Instead, regions have been classified as either having caught up to national growth (dynamic) or having not yet caught up (less dynamic), using our taxonomy. This allows us to identify successful policy initiatives and best practices from the dynamic group of regions, as well as bottlenecks from the less dynamic group paying special attention to policies and initiatives related to the key elements driving growth.

All case studies are structured into the following main sections:

- A snapshot of the region, examining region-specific characteristics such as geography, settlement patterns and historical context.
- A diagnosis section examining the region's performance, and paying special attention to the key growth factors, patterns of GDP growth, GDP growth, population growth, productivity growth, labour markets, human capital, infrastructure and innovation. The data used for the diagnosis come from the *OECD Regional Database*, as well as additional data provided by each region.
- The third and fourth sections identify a number of key factors responsible for growth and bottlenecks. These are based on our assessment using data and indicators, responses from the questionnaire and interviews as well as inputs from consultants and experts. Whilst the growth factors and bottlenecks do not provide an exhaustive picture of the key drivers of growth and bottlenecks in each region, they represent critical and distinctive factors influencing the performance of the region both positively, and acted as bottlenecks during the period of examination.
- The final section is a statistical summary table for each region, comparing levels and growth rates among a wide range of indicators derived from the *OECD Regional Database* to national and OECD standards. For this reason, GDP is expressed in USD and PPP for ease of comparison.

An advantage of working with our taxonomy (benchmarking the performance of regions with national standards) is it captures relative improvements within the same national factors. This allows us to focus more attention on region-specific factors than on macroeconomic and structural ones. In addition most actors we interviewed were in one way or another involved in regional development. This yields an implicit bias towards identifying factors and bottlenecks specific to the region, which is also the interest of the overall project. This does not mean, however, that national and structural factors are not relevant to regional performance; however, this is a question that this project is neither designed nor equipped to answer.

These 23 case studies are followed by a final synthesis section, which summarises the main findings and conclusions from the case studies. These conclusions along with the main findings from Chapters 1 and 2 draw policy conclusions in the executive summary.

Aquitaine, France

Figure 3.1. **Aquitaine, France**

Regional category: Catching-up potential and growing below the national average

Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Aquitaine encompasses five smaller TL3 regions: Dordogne, Gironde, Landes, Lot-et-Garonne and Pyrénées-Atlantiques. In 2007 its population was 3.1 million, amounting to 5% of the national population. Its population density, at 69 people per km^2, is lower than the French average of 114. The region is located in the southwest of France with Midi-Pyrénées to the east, Limousin to the northwest and Poitou-Charente to the north. The region borders Spain to its south. The largest cities are Bordeaux, with 250 082 inhabitants, followed by Pau (84 978) and Bayonne (45 636),

making the region neither very monocentric nor very polycentric. Around 43% of the population live in rural communities, higher than the French average of 38% and slightly below the OECD average of 45%.

Important changes affecting the performance of the region include the regeneration of Bordeaux city-centre aimed at modernising the metropolitan area, or *Communauté urbaine de Bordeaux* (CUB). Major CUB initiatives include the tramway, the Garonne riverside rehabilitation or the Pau-Bordeaux highway, the *Operation d'interet public* (national spatial planning or OIN) Euratlantique programme and the *Schéma métropolitain de Développement économique* city plan. Public investments are integrated into the OIN Euratlantique programme and the city plan. Regeneration aims to stimulate the attractiveness of the whole region as a place to live and work through the development of trade, services and innovation functions of the city and its hinterland. The CUB population is projected to rise by 250 000, reaching 1 million inhabitants in 2030. This will require the creation of at least 75 000 new jobs in the decade to come. Along with regeneration, there was a change in the regional administration in 2005 bringing a new wave of dynamism missing in previous years and helping to modernise the public administration and its functions. Other important shocks came through two storms; the first in 1999 and the second in 2009 affecting the region's forestry and wood industry. This is one of the largest in France with the largest national forest located in the region. As a result of the storms, the region experienced an oversupply of wood triggering a subsequent crisis in the housing sector.

France is a unitary state with a three-tier system of sub-national government. The first tier consists of 26 regions (*régions*). The second tier includes 100 departments (*départements*) and the third tier 36 683 municipalities (*communes*). In 2006, 20.2% of government spending was devolved while 16.2% of total revenue came from the sub-national level. France significantly decentralised at the beginning of the 1980s, transferring homogenous blocks of responsibilities to the appropriate sub-national levels. Regional councils were subsequently elected by direct universal suffrage. New laws in 2004 and 2005 reinforced the transfer of powers to the regions and the departments and, to a much smaller extent, to the communes. Competencies are now distributed as follows: *i*) economic development and vocational training are essentially assigned to the regions along with territorial planning; *ii*) major infrastructure projects (such as ports and airports) are assigned to the departments or the regions as appropriate; *iii*) roads are assigned to the departments; *iv*) social services, including health and services to the elderly, fall essentially to the departments; *v*) education and culture are shared among the different levels. However compared to recent decentralisation trends in Italy and Spain, the French reforms have not resulted in any institutional primacy for the region.

Economic assessment

The taxonomy classifies Aquitaine as region with a catching-up potential, growing above the national average. In 1995, GDP *per capita* was USD 20 201 in PPP terms, around 12% below the national average and 7% above the OECD value. Over the period 1995-2007, GDP *per capita* grew at a rate of 1.7%, slightly above the national rate of 1.62% and below the rate of growth in OECD TL2 regions of 2.2%. Consequently the gap in GDP *per capita* decreased to 11% below the national level in 2007, although it is now only 1% above the average for OECD regions. The region has experienced higher population growth, at 0.8%, than the rest of the

country (0.51%) and in OECD regions (0.6%); and higher GDP growth overall at 2.5% than the national rate of 2.2%, but below the OECD pace of 2.8%. Convergence with national levels has therefore been driven both by dynamic population growth and GDP growth.

Below we summarise how the region performs compared to national and OECD averages for five key indicators. Figure 3.2 summarises its performance against the national average.

- **Productivity is falling behind**. Productivity – measured by GDP per employee – stood at 54 846 in PPP (expressed in USD) in 1995, around 9% lower than the national average and 23% above the OECD average. From 1995 to 2007, productivity in the region grew at 0.72%, more slowly than the national average of 0.92%, and significantly below the pace of growth of OECD TL2 regions of 1.83%, increasing the productivity gap nationally by two percentage points and surpassing OECD productivity levels in 2007 by only 9%. The main economic activities in the region according to number of employees include education, health and social services, with 355 200 employees, retail trade (155 412), public administration, research and support services (90 533), construction (76 298), transport and storage (60 414) and agriculture and food processing (58 464). There are 4 growth poles or 'super-clusters' in the region including laser technologies (*Route des lasers*), wood and pulp and paper (Xylofutur), ecotechnologies and in particular CO_2 storage and capture and geothermal techniques (AVENIA) and aerospace technologies (AESE) in co-ordination with aerospace valley in Midi-Pyrénées. Around the city of Bordeaux there are five clusters: the Blanquefort ecopark (green jobs), the aeropark cluster (aeronautic), the chemistry/logistic pole, the Bordeaux vineyards and the Euratlantic district focused on the creative class.

- **Labour market outcomes are mixed.** The region's pre-crisis employment rate was 64.3%, slightly above the average in French regions of 63.7% but below the OECD average of 66.7%. Youth unemployment is a particular problem. Although unemployment rates are around the national average at 7.3%, the youth unemployment rate is 20.45%, significantly higher than the national rate of 17.7% and the OECD average of 15.3%. Long-term unemployment rates overall are lower at 2.42% than the average in French regions of 2.7%, and around the OECD average but long-term unemployment is a major issue especially outside Pyrénées Atlantique and Gironde, with increasing numbers of people receiving social benefits. Around 7% of the population aged below 65, receive RSA (*Revenu de Solidarité Active*) a minimum income allocation. These groups are notably concentrated in a large corridor that links the Medoc edge and the Agen region encompassing cities such as Libourne, Bergerac, Villeneuve sur Lot and Marmande and numerous rural areas.

- **Human capital indicators in the region are quite strong** with 23% of the workforce classed as low-skilled in 2008, lower than the share in French regions of 26.3% and in OECD regions of 27.4%. The region also has a higher share of highly skilled workers, 28.3%, compared to an average of 27.8% for the French regions and 26% for the OECD regions. In recent years the region has made significant gains, reducing the proportion of low-skilled workers in its workforce by seven full percentage points and improving the proportion of highly skilled ones by six percentage points. Human capital improvements have been in part driven by the

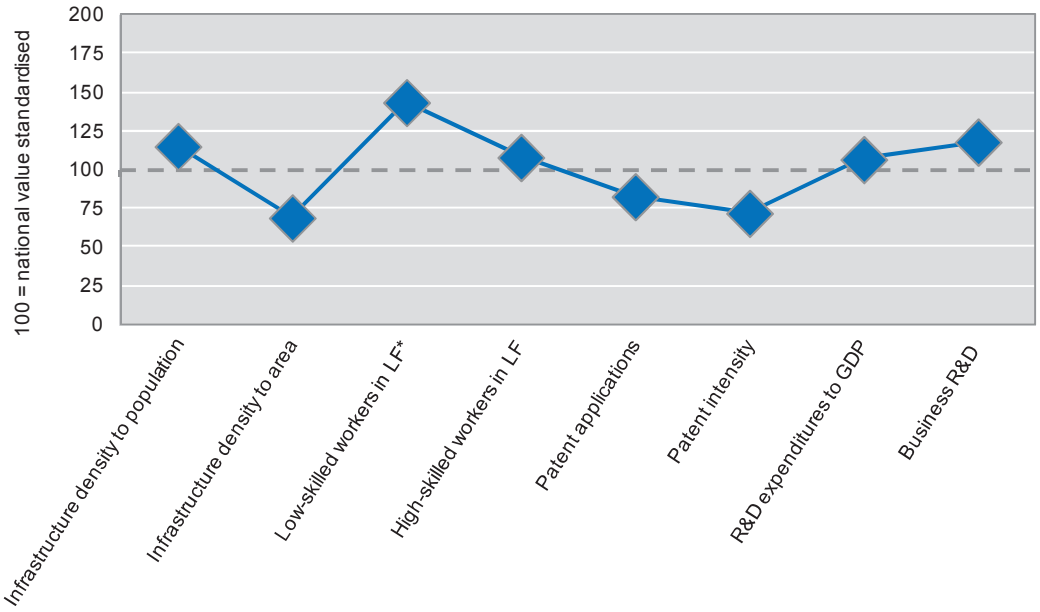
region's well-functioning higher educational institutions including Bordeaux's PRES (*Pôle de Recherche et de l'Enseignement Supérieur*), composed of four universities located in the city, and several *grandes écoles* (IPB, IEP and ENITAB).

- **Infrastructure density in the region is mixed.** In 2008 motorway density – measured by kilometres of motorway to its population – was 0.20, higher than the average in French regions of 0.18 and around the average for all OECD regions. In relation to its land surface area, motorway density is 15.2, below the French average of 20.3 and the OECD average of 21.91. Infrastructure has improved significantly in the recent years. The third tranche of tram investment has been started; new bridges have been built and the bus network has been modernised. New public transport services (Vcub, Car sharing, river shuttle) are now operating. The high speed train link from Bordeaux to Paris is being constructed and financing mechanisms have been agreed among the different stakeholders. The region will be made "less remote" than in the past. The region has been very active in improving broadband infrastructure with Pyrénées Atlantic acting as a pioneer (See OECD, 2006). Within the framework of Aquitaine numérique, the regional government is implementing a digital plan which will not only increase infrastructure deployment but also to combat digital illiteracy, improve training and develop public-private partnerships. The CUB has been quite active in this area providing financial support for a new generation of high-speed internet networks with a concession of EUR 25 million to a subsidiary of Caisse de dépôt.

- **Innovation activity is mixed with strong business involvement**. Innovation output in the region trails national and OECD standards with 186 patent applications compared to an average of 300 for French and 430 for OECD regions. Patent intensity is also lower at 59 patents per million inhabitants compared to 77 for the French regions and 85.6 for the OECD. The private sector invests the bulk of total R&D expenditure in the region. Business R&D expenditure was 1.16% of GDP, higher than the average in all French (1.02%) and OECD (0.93%) regions. In contrast the involvement of the public sector is significantly lower, less than half of what the public sector typically invests in all French and OECD regions. Several technological parks to be finalised soon include Biopark Galien, Bordeaux Aeropark, the Photonic City at Pessac, and the laser parks LASERIS I and II.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.2 examines the integrated structure of several critical growth drivers identified in this section, allowing a more integrated picture to be displayed. Looking at the picture for Aquitaine as a whole, the region enjoys above average levels of infrastructure density in relation to its population; human capital is also well above national standards, particularly its lower share of low-skilled workers. In contrast the region's key challenge lies in improving its innovation output with respect to its higher levels of inputs in R&D expenditures.

Figure 3.2. **How drivers of growth compare to the national average, Aquitaine, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced Aquitaine's performance:

- **Tourism development has been an important factor,** driven by the region's brand name and the attractions of the seaside, Périgord, the Pyrenees and the city of Bordeaux, which was the first urban space to become a UNESCO World Heritage site. Bordeaux captures a significant share of the tourists coming to Aquitaine (around 2.5 million per year). Bordeaux is renowned all over the world for its gastronomy and its wine. There are 120 000 hectares of vineyards in the vicinity of the CUB accounting for 8% of Gironde's GDP. The efforts to improve ICT infrastructure supporting tourism have been put in place. A challenge ahead for the city and the region is leveraging this comparative advantage further to attract more tourism and capitalise on its local know how.
- **The regeneration of Bordeaux city centre** through urban and spatial planning has been an important factor with the completion of several key projects particularly the modernisation of the tram system, the improvement of the roads around Bordeaux and investment in broadband. The aim of these policies has been to transform the city into a high-status European metropolis. Important urban rehabilitation projects and investments in eco-districts include the Bordeaux *lac photovoltaïc* plan, the DARWIN creative and ecotechnological activities pole, the Ginko ecodistrict, the Eco-intelligence Park in Begles and Bordeaux Chartrons eco-creative incubator. These efforts aim to further expand the creative class in Bordeaux, which already ranks fourth among French cities.

- **Strong research capacity,** mainly centred in Gironde. The city of Bordeaux is home to a great diversity of labs involved in advanced and leading edge technologies such as chemistry/Biotech (IECB), life sciences (ESTBB), composites (LCTS), optics, nanotechnologies and computer science (INRIA). The Institute of Lasers and Plasmas (with the LMJ Laser megajoule) has given a new impulse to laser R&D and this has been strengthened by the establishment of the IOGS (Institut d'optique Graduate School). The Bordeaux PRES (*Pôle de Recherche et de l'Enseignement Supérieur*) is composed of four universities located in the city and of several *grandes écoles* (IPB, IEP and ENITAB) and it functions well. Bordeaux universities are well positioned in engineering science and computer technologies. These efforts have in part been responsible for the regions above average share of highly skilled workers to its labour force.

Main bottlenecks for growth and development

- **Declining industries and not enough large enterprises**. Deindustrialisation has caused significant job losses, especially in industrial sectors with a high share of labour such as sectors specialised in intermediary goods, food processing and construction. These sectors have been the main factor behind the decline of GDP in 2009. Companies with more than 250 people are under-represented in Aquitaine and conversely SME are more important in the region than in the country as a whole.
- **Insufficient integration of the region's regional innovation system**. Despite having important niches such as wine, thermal spas, seaside tourism, creative industries and the drone defence systems, and a significant number of well-known technological parks, Aquitaine it has not been able to reach critical mass and integrate these disparate research and development industries into a functioning regional innovation system. The region records lower innovation-related indicators than nationally despite its efforts to stimulate new products and processes and despite devoting 10% of its budget to innovation to support excellence in R&D. Important bottlenecks include weak collaboration between central, regional and departmental levels, particularly in the tertiary education sector. The region also lags in services to firms and limited international co-operation. Seed funds such as iSource, Emertech and BioAm have not invested sufficient funds in innovative activities and regional funds have failed to provide an adequate substitute. Much is therefore expected from the national PIA (*Programme d'Investissements d'Avenir*).
- **Low entrepreneurial culture along with an anti–manufacturing bias**. The region's culture revolves around quality of life (the ocean, wine, *foie gras* and ceps) with anti-manufacturing industry feelings widespread among its citizens despite the firms' efforts to embark in a number of sectors in sustainable development activities. Entrepreneurial spirit is relatively low in the region which also suffers from an insufficient degree of internationalisation.
- **A surge of activities in the residential economy**[3] in recent years has not been conductive to making the region more competitive. This surge has been driven by the region's attractiveness to the elderly and retirees, generating a gradual shift towards residential services related to medical and social care offering low-skilled jobs. The shift towards services has been quite marked in a number of local economies, especially Dordogne, Périgord and on the coast. This has a limiting effect on the region's efforts to industrialise and further internationalise.

Table 3.2. **Statistical summary, Aquitaine**

	Period	Aquitaine	France	OECD	National gap	OECD gap
Levels						
GDP pc	1995	20 201	22 879	18 926	88%	107%
	2007	24 744	27 732	24 597	89%	101%
GDP	2007	78 271	1 323 439			
GDP share	1995	4.57%	n.a.			
Productivity	1995	54 846	60 025	44 513	91%	123%
	2007	59 795	67 010	54 713	89%	109%
Area (in km^2)		41 308	543 965			
Area share of national		7.59%				
Population	2007	3 146 500	61 771 000	3 481 456		
Population share	2007	5.09%	n.a.	n.a.		
Population density	2007	69	114	263		
Elderly dependency ratio	2008	30%	28%	21%		
Youth dependency ratio	2008	26%	27%	28%		
Motorway density (p)	2007	0.20	0.18	0.20		
Motorway density (a)	2008	15.20	20.30	21.91		
Primary attainment % LF	2008	23.0%	26.3%	27.4%		
Tertiary attainment % LF	2008	28.3%	27.8%	26.0%		
Unemployment rate	2008	7.3	7.3	6.3	0.02	1.1
Employment rate	2008	64.3	63.7	66.7	0.60	-2.4
Long-term unemployment	2008	2.42	2.7	2.4	-0.31	0.0
Youth unemployment	2008	20.45	17.7	15.3	2.71	5.1
Patent applications	2007	185.76	299.7	430.0		
Patents per million	2007	58.7	77.2	85.6		
R&D to GDP	2004	1.62%	1.54%	1.55%		
BERD to GDP	2004	1.16%	1.02%	0.93%		
GERD to GDP	2004	0.09%	0.19%	0.25%		
Changes						
GDP pc growth	1995-2007	1.71%	1.62%	2.2%		
GDP growth	1995-2007	2.52%	2.17%	2.8%		
Productivity growth	1995-2007	0.72%	0.92%	1.83%		
Population growth	1995-2007	0.80%	0.51%	0.6%		
WA population growth	1995-2008	0.79%	0.54%	0.8%		
Elderly dependency (pp change)	1995-2008	1.73	0.03	2.50		
Youth dependency (pp change)	1995-2008	-1.19	-0.02	-6.28		
Primary education (pp change)	1999-2008	-6.92	-8.77	-6.09		
Tertiary education (pp change)	1999-2008	5.18	7.12	5.84		
Employment rate (pp change)	1999-2008	2.70	6.25	1.87		
Unemployment rate (pp change)	1999-2008	-4.52	-5.16	-1.82		
Patents per million (pp change)	1995-2007	38.25	52.19	53.29		
R&D to GDP (pp change)	1995-2004	0.35	0.30	0.13		

Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Principado de Asturias, Spain

Figure 3.3. **Principado de Asturias, Spain**

Regional category: Catching-up potential and growing above the national average

Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

The Principado de Asturias was home to 1.05 million people in 2007; 2.3% of the Spanish population. The region has a higher than average population density of 102 inhabitants per square kilometre (the Spanish average is 78). The region is in northern Spain, neighbouring Galicia to the west, Cantabria to the east and Castilla y Leon to the south. The largest cities are Gijon, Oviedo and Aviles, hosting 275 699, 224 005 and 83 517 inhabitants respectively in 2009. These three main cities are no more than 34 kilometres apart, and enjoy strong linkages and close ties. Together, they

comprise a polycentric metropolitan area of nearly 900 000 inhabitants (85% of the region's population). The geographical barriers of sea and mountains concentrate both population and economic activity into the region's three main cities, allowing for potential scale effects. Twenty-eight per cent of the population lives in rural communities, which is lower than both the Spanish (31%) and OECD average (45%).

Asturias has had two important economic restructuring shocks in recent years:

- Economic restructuring − which continues today, but which was most intense during the 1980s and the early 1990s − caused the demise of the mining sector and heavy industry, with a profound effect on the region's identity and culture. It resulted in substantial employment losses to the region's mining community through the gradual phasing out of subsidies.
- Spain's integration into the EU during the late 1980s, which phased out previous protectionist policies and brought with it a process of structural transformation to improve the region's productivity to the point where it could compete in the international market. For example, it modernised its traditional sectors in coal and steel industries to give them a more diversified structure.

Spain is a unitary state with a three-tier system of sub-national government comprised of 17 autonomous communities (*comunidades autónomas*) at the regional level, 50 provinces (*provincias*) and 8 111 municipalities (*municipios*) at the local level. In 2006 the share of sub-central spending to total spending was 49% while that of sub-central revenues to total revenues stood at 35%. According to the Spanish constitution, all regions share the same level of competencies, with the exception of co-ordinating and managing official languages and security forces. Asturias' exclusive legislative role includes territorial planning, agriculture and livestock, fishing, domestic trade, culture, tourism and research, according to its statute of autonomy (Law 7/1981 30th December 1981). It has additional roles in legislative development and execution for areas such as health, hospital co-ordination, pharmaceutical regulation, education and environmental protection. The devolution of authority to Asturias has occurred gradually, but between the 1990s and 2010, the 23 new mandates were devolved to the region in matters ranging from non-university education to active employment policies, healthcare and justice. These latest transfers involve managing a budget of over EUR 1 400 million and have led to the hiring of around 27 500 new employees, swelling the region's public employment ranks from 6 000 to 35 000.

Economic assessment

The taxonomy classifies Asturias as a region with catching-up potential and above average growth rates. In 1995 its GDP *per capita* was USD 15 721 in PPP, around 14% below the Spanish average and 17% below the OECD average for large (TL2) regions. Between 1995 and 2007, growth in GDP *per capita* amounted to 3%, outperforming the national pace of growth (2.4%) and the average for OECD regions (2.2%). Consequently the gap in GDP *per capita* closed over this period to just 8% below the national average and 10% below the OECD average. Asturias' GDP growth rate for the period was slightly below the national pace of growth (3.5%) and the average growth rate in OECD TL2 regions (2.8%). Over this period the region's population declined by 0.16 percentage points, while the average population increase for Spanish regions increased by 1.08 pp.

Below we summarise how Asturias performs compared to national and OECD averages for five key indicators. Figure 3.4 summarises this performance against the national average.

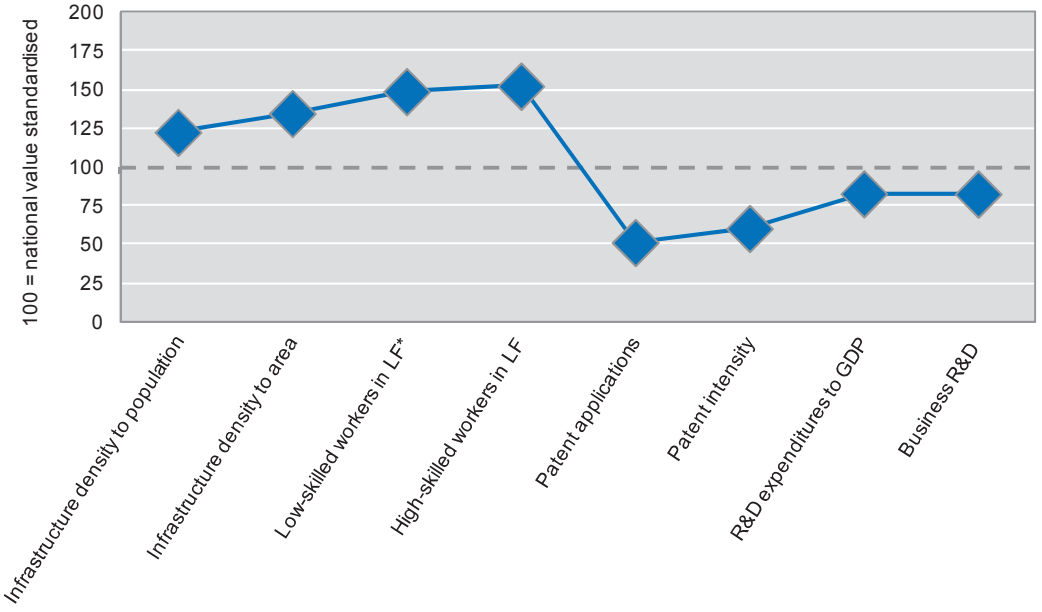
- **Productivity** in Asturias – measured as GDP per employee – stood at USD 50 801 in PPP in 1995, 4% below the national average. Over the 12-year period, productivity growth in the region (0.6%) exceeded the Spanish average pace of growth (0.08%), and consequently the region's productivity level in 2007 surpassed national standards by 2%. This suggests the region's catching-up effect is driven by productivity gains following the profound structural changes described above. The gradual phasing out of coal and mining activities and the integration of the steel industry into large multinationals (such as Arcelor Mittal) has reduced the weight of the industrial sector and improved its competitiveness in international markets. The service sector experienced notable gains − from 61.5% of the region's gross value added (GVA) in 2000 to 66% in 2010 − with particular improvements in business services. The agricultural sector also gained productivity by reducing its employment share while maintaining its GVA share. Finally the construction sector grew, but at more slowly than the national average due to a regional law protecting the coastline.
- **The labour market surpasses national standards** with lower rates of pre-crisis unemployment (8.5% *versus* the national rate of 11.3%), lower rates of long-term unemployed (2.32% as opposed to 2.5%) and lower rates of youth unemployment (21.5% as opposed to 24.8%). Employment rates in the region were slightly below the national rate (62.6% *versus* 63.8%) in 2008. They increased by 15.7 percentage points between 1995 and 2008; a significantly higher increase than the Spanish regional average of 10.4 pp. An analysis of growth accounting provided by the regional authorities in the questionnaire, which breaks down GDP *per capita* into productivity, employment rates and demographic factors, reveals that almost 80% of the region's catching-up growth can be explained by improvements in the labour market between 2000 and 2010.
- **Human capital has been strengthened**. Between 1999 and 2008, Asturias reduced the proportion of low-skilled workers in its labour force by 14 percentage points, and increased the proportion of highly-skilled workers by 7.7 pp. These gains exceeded national standards (12.3 pp and 6.6 pp respectively). Compared to the national average, in 2008 the region had a smaller share of low-skilled workers in its labour force (39.1%) and a greater share of highly skilled workers (37.5%). Improvements in achievement by obligatory secondary school students (ESO) over the past decade were significantly higher than in Spain on average (around 7 pp), and were the third highest results in 2008/09 for all Spanish regions. In 2006, 15-year-olds from Asturias scored higher than the national average in PISA for both reading (477 *versus* the national average of 461) and mathematics (497 *versus* the national average of 480).
- **Transport infrastructure has improved** in the region for road, rail, air and sea. This previously inward-looking region now has fast connections to Spanish, European and international markets. Internal transport is also being improved, but more remains to be done. In 2008, Asturias' motorway density ratio – measured by kilometres of motorway to its population – was 0.37, higher than the national average in Spain (0.30) and also above the OECD average (0.20). Aviles and Gijon are the region's most important ports; both are now connected. Gijon has seen an important extension in recent years following investment totalling 11% of the region's GDP. This port is becoming an import hub for the region and is home to the first seaport sea-highway connecting Gijon to Nantes in France. The main road improvements include the completion of the Cantabrico highway

− connecting the region to the eastern and western corridors; the Huerna highway connecting the region to Madrid through the Guadarrama tunnel; and the Mineria highway, improving internal connectivity. The region's airport is centrally located for the region's three main cities and its accessibility has improved in recent years. Despite these gains, some road sections need to be completed to link Asturias to the national network; the high-speed rail network also needs to be extended to the centre of Asturias.

- **Innovation is below national standards**. The region has fewer overall patent applications (11.2) than Spanish regions on average (98.4) and many fewer then the OECD average (430) (Table 3.3). In relation to its population, patent intensity is also significantly low (10.6 patents per million inhabitants), around 25% of the national average (45) and much lower than the OECD average (85.6). Total expenditures on R&D as a percentage of GDP are slightly lower (0.71%) than nationally (0.81%) and around half the average for OECD regions. The share of business R&D expenditure to GDP (0.34%) is lower than the Spanish regional average (0.42%) and around one-third of the OECD regional average (0.93%). Expenditure by the public sector on R&D as a percentage of GDP in Asturias is 0.12%, which is around the average for Spanish regions but less than half of the share typically invested by the public sector in OECD regions.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for regional growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009b). Examining the integrated picture for Asturias (Figure 3.4) reveals the region has adequate levels of infrastructure and human capital; however, the region's key challenge lies in improving its innovation output by increasing R&D expenditures.

Figure 3.4. **How drivers of growth compare to the national average, Asturias, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

The main factors behind this region's growth are as follows:

- **Infrastructure improvements** have connected a relatively closed region to external markets. Infrastructure investments in Asturias made by the EU, the state, the regional and the municipal authorities are amongst the highest *per capita* and per square kilometre in Spanish and EU terms. They have improved infrastructure for all modes of transport: road, rail, sea and air and have accelerated the region's structural shift from heavy industry and mining to a more diversified and competitive industrial base. These lower transportation costs have doubled imports and exports in Asturias in the last ten years, and have also facilitated and enhanced inflows of people to the region from outside.

- **Improvements in human capital** have gone hand in hand with the region's structural transformation. The region's mining heritage did not require training for a large share of the workforce. The implementation of programmes such as *empresa va a la escuela* (the firm goes to school), targeting new young kids; *orientacion educativa* (educational orientation), targeting technical students; and efforts by the *centros integrados de formación professional* (integrated centres for professional training) to improve communication between the private sector and education centres have all paid off, allowing human capital to gradually respond more to the demands of the market. The region has been successful in reducing the share of low-skilled workers in its workforce, which now has an above average proportion of high-skilled workers. Finally the region boasts superior PISA scores and a lower share of school dropouts.

- **A move out of traditional productive sectors supported by negotiation and conflict resolution allowed mobilising key actors**. Mining was traditionally a very powerful sector in the region and had strong union representation. The phasing out of this industry over the past decades has brought tension and conflict among unions, business representatives and regional authorities. The Mayor of Gijon at that time reached out to these different actors, bringing them to the negotiating table to sign a key agreement (the tri-partite accords) in July 1999. This agreement brought peace and stability, created confidence and involved the key regional actors in the process of decision making and development.

- **A shift from reliance on external subsidies to reliance on internal growth potential.** In the decades leading up to Spain's entry into the EU, Asturias' economy was primarily based on coal mining and heavy steel mainly to feed an internal closed national economy protected by heavy tariffs. In exchange, the region was heavily subsidised. Entry into the EU forced the region to open

towards international markets and phase out subsidies, and to diversify and modernise the region's traditional industries, as discussed above. Additional initiatives, such as coastal protection laws, not present in other Spanish regions, helped the region avoid the excessive reliance on the surging construction sector seen elsewhere in Spain. Thus its economy was more robust when the construction bubble burst and it weathered the crisis better than other regions. It also achieved environmental goals.

Main bottlenecks for growth and development

- **Demographic effect and an excessive elderly population**. The region's population declined by 0.16% between 1995 and 2007, even though population was increasing nationally by 1.08%. The decline was even larger in the working age population (0.17% *versus* a national increase of 1.18%) thus reducing the size of the region's potential labour force. In addition to overall population decline, Asturias' population is ageing more rapidly than across Spain as a whole. Elderly dependency ratios in the region increased by four percentage points between 1995 and 2008, while in Spain they were quite stable and in the OECD they were increasing at a slower pace (2.5 pp). The region's elderly dependency rate in 2008 was 32%, 7 percentage points higher than the Spanish regional average (25%) and 11 percentage points higher than in the OECD (21%). This raises the costs of service delivery, such as health care, assistance, homecare and transport.

- **Insufficient involvement of the private sector in R&D**. Asturias is producing less innovation output than nationally and in the OECD – measured as total patent application and patent intensity – in relation to its R&D expenditures. The involvement of the private sector is particularly low in the region, while public R&D expenditure is roughly the same as the national average. Greater investment by the private sector would help link innovation activities to the region's productive base as well as help to commercialise them.

- **Weak entrepreneurial spirit** is one historical legacy of strong public intervention in the region's core industrial activities. The mentality of secure public sector employment was more deeply entrenched in Asturias than in other Spanish regions. Although the structural shifts of recent decades have slowly changed this mentality, improving the entrepreneurial culture is a priority for the region.

Table 3.3. **Statistical summary, Asturias**

	Period	Asturias	Spain	OECD	National gap	OECD gap
Levels						
GDP pc	1995	15 721	18 195	18 926	86%	83%
	2007	22 338	24 200	24 597	92%	91%
GDP	2007	23 647	716 666			
GDP share	1995	2.18%	n/a			
Productivity	1995	50 801	52 850	44 513	96%	114%
	2007	54 574	53 353	54 713	102%	100%
Area (in km^2)		10 604	505 987			
Area share of national		2.10%				
Population	2008	1 059 136	45 283 259	3 481 456		
Population share	2008	2.34%	n/a	n/a		
Population density	2008	102	89	263		
Elderly dependency ratio	2008	32%	25%	21%		
Youth dependency ratio	2008	15%	22%	28%		
Motorway density (p)	2008	0.37	0.30	0.20		
Motorway density (a)	2008	36.68	26.71	21.91		
Primary attainment % LF	2008	39.1%	44.0%	27.4%		
Tertiary attainment % LF	2008	37.5%	32.8%	26.0%		
Unemployment rate	2008	8.5	11.3	6.3	-2.84	2.2
Employment rate	2008	62.6	63.8	66.7	-1.24	-4.1
Long-term unemployment	2008	2.32	2.5	2.4	-0.18	-0.1
Youth unemployment	2008	21.53	24.8	15.3	-3.28	6.2
Patent applications	2007	11.18	98.4	430.0		
Patents per million	2007	10.6	45.0	85.6		
R&D to GDP	2005	0.71%	0.81%	1.55%		
BERD to GDP	2005	0.34%	0.42%	0.93%		
GERD to GDP	2005	0.12%	0.12%	0.25%		
Changes						
GDP pc growth	1995-2007	2.97%	2.40%	2.2%		
GDP growth	1995-2007	2.61%	3.52%	2.8%		
Productivity growth	1995-2007	0.60%	0.08%	1.83%		
Population growth	1995-2008	-0.16%	1.08%	0.6%		
WA population growth	1995-2008	-0.17%	1.18%	0.8%		
Elderly dependency (pp change)	1995-2008	4.28	0.02	2.50		
Youth dependency (pp change)	1995-2008	-4.52	-12.34	-6.28		
Primary education (pp change)	1999-2008	-13.97	6.56	-6.09		
Tertiary education (pp change)	1999-2008	7.70	0.07	5.84		
Employment rate (pp change)	1999-2008	15.75	10.42	1.87		
Unemployment rate (pp change)	1999-2008	-9.46	-4.13	-1.82		
Patents per million (pp change)	1995-2007	7.56	38.03	53.29		
R&D to GDP (pp change)	1995-2005	0.19	0.29	0.13		

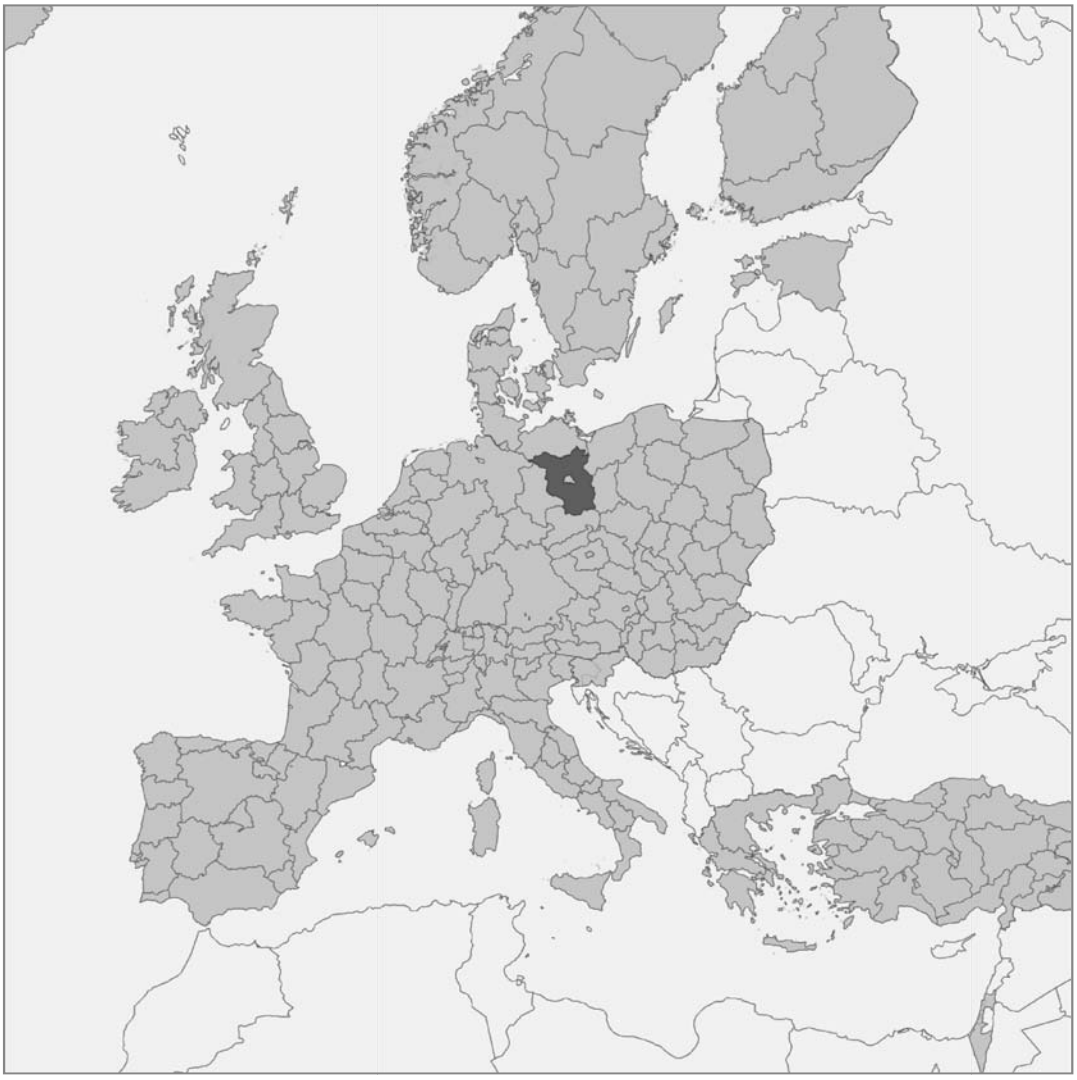
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Brandenburg, Germany

Figure 3.5. **Brandenburg, Germany**

Regional category: Very large catching-up potential and growing above the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot[4]

Brandenburg encompasses five smaller TL3 regions, Prignitz-Oberhavel, Uckermark-Barnim, Oderland-Spree, Lausitz-Spreewald and Havelland-Fläming. Its population in 2008 was 2.5 million, or 3% of the German population. Its population density, at 86 people per km^2 is lower than the German average of 230. The region is located in the east of Germany with Poland to its east. Its neighbouring regions are Sachsen to the south, Sachsen-Anhalt to the west, and Mecklenburg-Vorpommern to the north; it also shares a smaller border area with Niedersachsen to the north-west. The Berlin region is located in the middle of Brandenburg.

The largest cities are Potsdam, with 156 906 inhabitants, Cottbus (102 091), Brandenburg and der Havel (71 778) and Frankfurt Oder (60 330), fairly spread out around the region. Berlin, which is located in the middle and belongs to a different administrative authority, is home to 3.4 million inhabitants. In this sense Brandenburg appears quite polycentric, but when Berlin is taken into account it becomes quite monocentric, given Berlin's dominance. Just under half, or 46% of the population live in rural communities, almost double the figure for Germany and close to the OECD average of 45%.

The region has experienced a tremendous structural change during the past decades with the transition from a closed communist economy to a fully open market economy on 1 July 1990 with the unification of East and West Germany. The open economy was viewed as a cure to the region's economic ills and lower level of development with respect to its western neighbours. Instead, the transition brought a country-wide revaluation shock caused by the currency conversion, the loss of exchange-rate sovereignty, the associated crumbling of the eastern sales market, and the closing down of large state-owned enterprises which caused the region's production structure to collapse. All these factors led to a direct loss of competitiveness in the region. Within a month, industrial production fell to 56% of the December 1989 figure. Rapid equalisation of wages in the east to western levels subsequently caused it to decrease further. Almost 1 million jobs in industry were lost between 1991 and 1995. A further 0.3 million jobs disappeared from agriculture and mining. From 1991 to 1993, the total number of employed people in East Germany decreased by 13%, and around 80% of the region's workforce is estimated to have changed employment activities over this period. As a result the region has suffered severe population decline and only modest capital investments − not one German firm has relocated its headquarters to the region. Transfers and subsidies from the Federal Republic and the European Commission became an important means for the region's survival. Over time subsidies are gradually being phased out and the region has managed to close the gap with respect to national standards over 1995-97. Nowadays the region enjoys a modern and efficient production base with a promising future.

Germany is a federal state with three tiers of sub-national government. The top tier consists of 16 federated states (*Länder*) the second tier 323 rural districts (*Landkreise*) and the third tier, 12 196 municipalities (*Gemeinden*) and 116 district-free cities (*Kreisfreie Städte*). In 2006, 37.1% of all spending was devolved while states and below accounted for 35.9% of total revenue.

According to the German constitution, the federal states' legislative competences are limited and include essentially education, culture, local and police matters. However, the state governments are also responsible for the implementation of most federal laws and notably regional economic policy.

Economic assessment

The taxonomy classifies Brandenburg as a region with very large catching-up potential, growing above the national average. In 1995 GDP *per capita* was USD 15 706 in PPP dollars, 64% of the national average. Over the period 1995-2007, its GDP *per capita* grew by 2.1%, outperforming the national growth rate of 1.13% but slightly below the rate in OECD TL2 regions of 2.2%. Consequently the gap in GDP *per capita* closed over this period to reach 71% of the national average. The region has experienced population declines of 0.01%, at a time when the German population increased on average by 0.05% and in the OECD even by more (0.6%). GDP overall grew at a faster rate (1.7%) than nationally (1.19%) so the catching up of the region is not entirely driven by population decline.

Below we summarise how Brandenburg performs compared to national and OECD averages for five key indicators. Figure 3.6 summarises its performance against the national average.

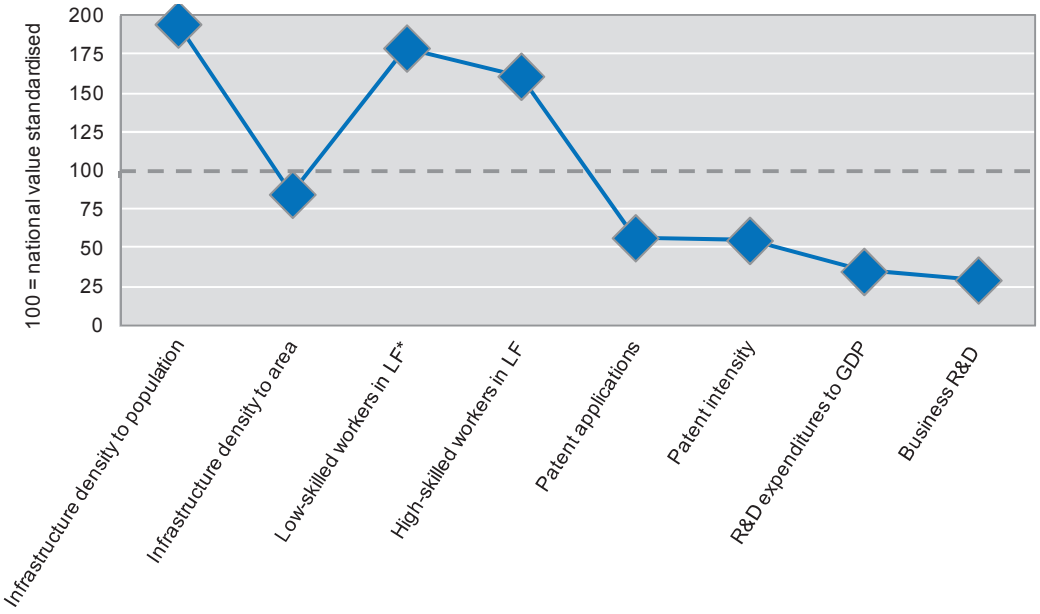
- **Productivity, although below national standards, has been increasing**. Productivity – measured by GDP per employee – stood at USD 38 719 in PPP in 1995, 34% lower than the national average and 13% lower than the OECD average. From 1995, productivity in the region grew at a rate of 0.78%, significantly higher than the national rate of 0.35%, and consequently the region closed the gap by six full percentage points, reaching 30% below the national average by 2007. Improvements in infrastructure and connectivity and adequate levels of human capital have driven this rise. The region's key sectors are, in order of importance, logistics (29 511 employees subject to mandatory social insurance contributions), media/ICT/geo-information (25 382), metals (23 904) and the food industry (17 262). The surge in logistics has been driven by the region's proximity to eastern markets, a well-developed infrastructure, adequately skilled workers and close involvement by universities and research centres. The region is one of the largest media centres of Europe due to an efficient service structure, the support by networks and institutions, a virtually complete value-added chain, and a geo-information R&D structure. The positive development enjoyed by the food industry is due its proximity and connections to the Berlin market, growing awareness of products from the region and its organic produce, and state-of-the-art production facilities. On the downside, the region's low proportion of major companies and high proportion of small and very small businesses could be a bottleneck to further productivity gains.
    - The region's main clusters include the transport mobility logistics cluster, the energy technology cluster, the health care cluster, the optics cluster and the ICT media creative industry cluster. The ten most important companies – according to the number of employees – with headquarters in Brandenburg are: Rolls-Royce Deutschland Ltd. & Co. KG (1 900 employees operating in the automobile sector), Eon Edis AG (1 868/energy), Möbel Höffner (1 800/trade), KMG Kliniken AG (1 513/health care), First Solar Manufacturing GmbH (1 260/energy), PCK Raffinerie GmbH (1 140/energy), GSE Protect Gesellschaft für Sicherheit und Eigentumsschutz mbH (905/service industry), Brandenburg-Klinik GmbH & Co.KG (900/health care), Dahlewitzer Landbäckerei GmbH (845/food), Bäckerei Peter und Cornelia Dreißig KG (838/food).
- **Labour market outcomes are mixed**. On the one hand employment rates in the pre-crisis years were higher at 71.4% than the national rate of 70.2% and the OECD rate of 66.7%. On the other hand, unemployment rates were also higher at 11.5% against the national rate of 9%, as were long-term unemployment rates at 6.85% against the national rate of 5%, and youth unemployment rates at 14.46% against the national rate of 12.2%. The gradual integration of women into the workforce has been an important development in the region, following a nationwide trend. Female participation rates during 1998-2009 increased from 64% to 80%. Female employment rates also increased from 59% to 71% over this period, around two full percentage points more than nationally.

- **Human capital is a key strength.** Brandenburg has just 5.3% of low-skilled workers, i.e. with only primary qualifications, in its labour force compared to 11.1% in Germany as a whole and 27.4% in OECD TL2 regions. It also has a higher share of highly skilled workers at 31.7% than the German average of 28.1% and the OECD average of 26%. Brandenburg has maintained these levels of human capital despite significant population declines during the transition period, when highly skilled workers would typically go in search of employment opportunities elsewhere. The region has continued to supply highly skilled workers through the establishment of a number of universities and Universities of Applied Sciences, such as the Technical University of Cottbus or Brandenburg University of Applied Sciences, providing Brandenburg, in conjunction with Berlin, with a density of scientific institutions which is quite unique in Europe.
- **Infrastructure is above national and OECD standards**. In 2008 motorway density – measured by the ratio of kilometres of motorway to population – was 0.31, twice as large as the German average of 0.15 and significantly higher than the OECD average of 0.20. Since reunification, improving transport infrastructure has been one of the most important public investment projects in the region with the "German Unity Transport Projects" (VDE)5 playing a critical role. The VDE is a nationally based project supplemented regionally by specific infrastructure schemes. Among other things, it has brought to the region the BBI International Airport, large-scale development of the road network and the development of freight distribution centres in Großbeeren and Wustermark, and the creation of a regionally harmonised infrastructure for freight transport and logistics focusing on distribution centres and on the interlinking of transportation providers. The region has also put significant effort into rebuilding its landscape, turning large open-cast brown-coal mines into lakes.
- **Innovation activity is mixed** with low private sector involvement**.** The region had 250 patent applications in 2007 (Table 3.4), less than the German average of 1 139 and the OECD average of 430. Patent intensity in relation to its population is also lower, at 98.3 per million, than the national rate of 164.3 but above the OECD average of 85.6. Expenditure on R&D was 1.18% of GDP, around half the national average of 2.08% and lower than the OECD average of 1.55%. R&D expenditures are mainly driven by the public sector, which spends more than double the private sector. The public sector share 0.62% of GDP in the region is almost twice the rate nationally of 0.43% and well above the OECD rate of 0.25%. By contrast, private sector involvement is significantly lower, less than one-fourth of what the private sector typically spends in German regions in R&D activities, and one-third of the private expenditures in OECD regions.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.6 examines the integrated structure of several critical growth drivers identified in this section, allowing a more integrated picture to be displayed.

Looking at the picture for Brandenburg as a whole, the region has good infrastructure (relative to its population), and above average human capital. The region's key challenge lays in improving its innovation and in particular increasing the role of the private sector.

Figure 3.6. **How drivers of growth compare to the national average, Brandenburg, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements for growth and development

A number of distinct factors have influenced the performance of the region:

- **Adequate infrastructure investments** in the region have improved its accessibility and connectivity to European and international markets. Measures of potential market accessibility place the region at 75% above the average of European regions. Infrastructure improvements have modernised all modes of transportation, including air, road, and rail, making the region's transport and logistics industry very competitive. Small-scale network expansion within the region itself has been of equal importance. All these initiatives have turned the region's favourable geographic location into an asset.
- **Human capital has been critical.** The region already has a higher proportion of highly skilled workers and a lower proportion of low-skilled ones and recent efforts have targeted matching supply to demand in the region. The region has adopted an approach based on risk management. This approach strengthens on the one hand the supply of human capital in the region targeting the high-skilled workers through higher educational institutions and groups on the labour market facing particular risk situations (such as the low skilled and older workers). On the other hand the approach focuses on the demand side covering companies in areas such as the promotion of continuing vocational training and business start-ups. For example in the logistics sector, the region's most important sector, Wildau Technical University of Applied Sciences has been an important institute of higher education conducting and teaching logistics-related research**.**
- **A policy shift from subsidies to growth**. The region has experienced a shift in its development approach from a mentality dominated by subsides and transfers towards one more focused on growth potential. Since unification the regional and local authorities have

put tremendous efforts into mobilising local actors and firms to take part in the development process with the gradual phasing out of subsidies[6] in 1995 as part of the Solidarity Pact. With these goals in mind the region established a new policy identifying 15 Core Regional Growth Areas with high growth potential in 2004. These "growth poles" receive preferential financing and are required to display endogenous growth potential. The growth poles are also required to design integrated development strategies which are harnessed to the overall region's development strategy. Additionally, growth poles are required to spread some of their benefits to other territories. This policy has been an important element shifting the mentality in the region, resulting in a new spirit of competiveness. The policy deliberately targeted enough growth poles to create a diverse development pattern and induce other areas in the region to focus on their own growth potential and potentially also become growth poles. The 15 growth poles are home to 35% of the population and have so far generated positive initiatives of co-operation between towns. The growth poles have been a key element to the region becoming less dependent on subsidies and transfers and more focused on growth for development.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.4):

- **Population decline is a long-term reality**. Over the past two decades the region's population decreased by 118 659 inhabitants, representing 4% of the region's 1990 population. The decline has been triggered by outmigration, particularly young people leaving for West Germany and Europe, and a gradual decline in birth rates. The birth rate deficit is the main cause of the population decline. Estimates for 2030 suggest the population will continue to decline by approximately 295 000 to 2.2 million. The areas surrounding Berlin will see a moderate rise in population, and the more remote parts of the state will face a significant fall. The region also has a higher elderly dependency rate (25%) than nationally with a significant rise (by 0.91 percentage points) recent years at a time when it decreased nationally. This brings challenges, especially high costs of service delivery, such as health care, assistance and homecare.

- **Low business R&D investment.** The innovation profile of the region is characterised by an innovation system with a comparatively low level of overall R&D intensity, especially on the part of the private sector. Whereas nationally and in the OECD regions, public institutions account for only one-third of the R&D volume, this proportion is practically reversed in Brandenburg. Despite this, the region is making rapid advances in this area. An example of this is the initiation of the GO incubator in 2007, the region's largest science park, employing around 10 000 people and aimed at supporting start-ups and encouraging entrepreneurial activities in the region.

- **Small numbers of large companies.** The region's small share of major companies and high proportion of small and medium-sized businesses could be a bottleneck to further productivity gains, and to improving the low involvement of the private sector in R&D activities. Despite these limitations however, the region has weathered the effects of the crisis quite well experiencing a smaller decline in GDP as other Germany regions, partly due to its the small proportion of large companies with exposure and vulnerability to global shocks.

Table 3.4. **Statistical summary, Brandenburg**

	Period	Brandenburg	Germany	OECD	Nat gap	OECD gap
Levels						
GDP pc	1995	15 706	24 680	18 926	64%	83%
	2007	20 053	28 232	24 597	71%	82%
GDP	2007	50 971	2 015 780			
GDP share	1995	2.19%	n/a			
Productivity	1995	38 719	58 291	44 513	66%	87%
	2007	42 511	60 786	54 713	70%	78%
Area (in km^2)		29 480	357 109			
Area share of national		8.26%				
Population	2008	2 535 737	82 217 837	3 481 456		
Population share	2008	3.08%	n.a.	n.a.		
Population density	2008	86	230	263		
Elderly dependency ratio	2008	31%	31%	21%		
Youth dependency ratio	2008	16%	19%	28%		
Motorway density (p)	2008	0.31	0.15	0.20		
Motorway density (a)	2008	26.97	35.40	21.91		
Primary attainment % LF	2008	5.3%	11.1%	27.4%		
tertiary attainment % LF	2008	31.7%	28.1%	26.0%		
Unemployment rate	2008	11.5	9.0	6.3	2.42	5.2
Employment rate	2008	71.4	70.2	66.7	1.14	4.7
Long-term unemployment	2008	6.85	5.0	2.4	1.85	4.5
Youth unemployment	2008	14.46	12.2	15.3	2.27	-0.9
Patent applications	2007	249.62	1139.1	430.0		
Patents per million	2007	98.2	164.3	85.6		
R&D to GDP	2005	1.18%	2.08%	1.55%		
BERD to GDP	2005	0.29%	1.21%	0.93%		
GERD to GDP	2005	0.62%	0.43%	0.25%		
Changes						
GDP pc growth	1995-2007	2.06%	1.13%	2.2%		
GDP growth	1995-2007	1.70%	1.19%	2.8%		
Productivity growth	1995-2007	0.78%	0.35%	1.83%		
Population growth	1995-2008	-0.01%	0.05%	0.6%		
WA population growth	1995-2008	-0.16%	-0.18%	0.8%		
Elderly dependency (pp change)	1995-2008	12.64	0.09	2.50		
Youth dependency (pp change)	1995-2008	-9.59	-0.04	-6.28		
Primary education (pp change)	1999-2008	-2.01	-3.12	-6.09		
Tertiary education (pp change)	1999-2008	-1.45	0.82	5.84		
Employment rate (pp change)	1999-2008	9.13	7.06	1.87		
Unemployment rate (pp change)	1995-2008	-1.64	-2.75	-1.82		
Patents per million (pp change)	1995-2007	83.20	111.83	53.29		
R&D to GDP (pp change)	1995-2005	-0.20	0.11	0.13		

Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Central Transdanubia (Közép-Dunántúl), Hungary

Figure 3.7. **Central Transdanubia (Közép-Dunántúl), Hungary**

Regional category: Catching-up potential and growing above the national average

Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

The Central Transdanubia region had a population in 2007 of 1.1 million, or around 11% of the Hungarian population. Total production totalled USD 16.3 million in PPP dollars in 2007, contributing to around 10.2% of the national GDP. The region encompasses three counties, Fejér, Komárom-Esztergom and Veszprém classified respectively as predominantly rural, intermediate and intermediate. Overall, 46% of the population live in rural communities with a population density of less than 150 people

per km^2. The largest cities in the region are Székesfehérvár, with 101 973 inhabitants, Tatabánya (70 333), Veszprém (63 405) and Dunaújváros (48 562).

Two historical events have played an important role in the economic performance of Central Transdanubia. The first, in common with most Eastern European economies, has been a period of market liberalisation in the early 1990s as part of the transition from a socialist to a market-based economy, bringing a process of restructuring in core economic sectors. The region experienced a significant influx of foreign capital and has been able to modernise its economic activities and more recently has placed increasing emphasis on innovation-driven economic activities.

The second important change in the region was EU accession in 2004, which opened borders to the west and closed those to the east. Since accession the region has enjoyed a location close to Western markets. EU accession also brought changes to regional policies such as the gradual regionalisation of policy through regional government offices and the building of local capacity through developing locally-defined regional economic strategies linked to EU-funded programmes.

Economic assessment

Central Transdanubia is classified as a region with catching-up potential, growing above the national average. In 1995 GDP *per capita* was USD 9 042 in PPP terms, 9% below the national average of 9 883 and 52% below the OECD average. In the period to 2007 it experience annual average growth of 4.2%, faster than the national average of 4.04% and the OECD growth rate of 2.2%. As a result, the region closed its gap in GDP *per capita* with respect to the national and the OECD average standing 5% below the national average (14 766) and 40% below the OECD average. GDP overall grew at a faster rate (4.04%) than nationally (3.81%) and almost twice the growth in OECD regions (2.2%). Although population declined by 0.13%, in Hungary it declined by 0.21% so the catching up of the region is not entirely driven by population decline.

Below we summarise how Central Transdanubia performs compared to national and OECD averages for a number of key indicators. Figure 3.8 summarises its performance against the national average.

- **Productivity is lagging but has been catching up to national standards.** Productivity – measured by GDP per employee – stood at USD 25 348 in PPP in 1995, trailing the national average by 10%. By 2007, the gap increased to 14% below the national average with productivity standing at 34 997. The region recorded the second highest productivity growth (2.72%) among Hungarian regions. Despite this, its productivity gap has been increasing with respect to national standards due to the dynamic growth of the capital region, Közép-Magyarország, which saw productivity grow by 4.54% pulling the national weighted value upwards. The region's economy is heavily dominated by the industrial sector, with a 43.8% employment share, the highest of all the Hungarian TL2 regions; industrial production *per capita* is more than twice the national average. The contribution of the service sector to GDP is below the national average and the contribution of agriculture is minimal. The region’s leading sectors are mechatronics, the automotive industry, plastics, environmental industry, IT and the food industry.

- **Labour market performance is strong.** The region's pre-crisis unemployment rate was 5.8% in 2008, lower than the national rate of 8.5% and the OECD average of 6.3%. Youth unemployment was 15.5%, around the OECD average of 15.3% and five percentage points below the national average of 20.5%. Long-term unemployment was 2.16%, slightly below the OECD average and half the national average. The employment rate, at 59.6%, is higher than the national average of 55.2% but lower than the OECD average of 66.7% in 2008. Over the period 1995-2008 the employment rate increased by 1.59 percentage points, higher than the national rise of 1.28 percentage points. The region's unemployment rate fell by 0.25 percentage points during a period when the country overall experienced an increase of 1.2 points.

- **Human capital has room for improvement,** both in reducing the numbers of low-skilled workers and increasing the numbers of highly skilled ones. In 2008 the share of low-skilled workers – those with only primary qualifications – was 15.8% of its workforce, higher than the Hungarian average of 14.7%, while its share of highly skilled workers was 18.5%, lower than the Hungarian average of 20.1% and significantly lower than the OECD average of 26%. Over the period 1995-2008, the region reduced the proportion of low skilled workers by 0.93 percentage points and increased high skilled workers by 2.16 pp. These improvements were lower than observed nationally (2.32 and 3.78 respectively).

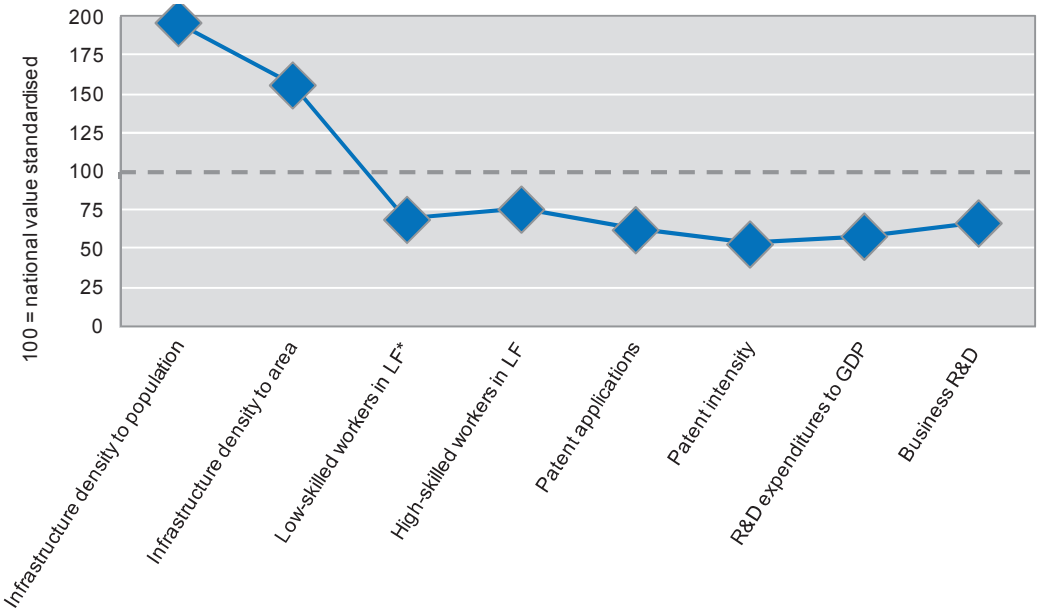
- **Infrastructure is above the national and OECD standards.** In 2008 motorway density – measured by the ratio of kilometres of motorway to population – was 0.23, almost twice as large as the Hungarian average (0.13) and above the OECD average of 0.20. In relation to its surface area, motorway density 22.87 also surpassed the national average value (13.69) and stood around the OECD average. The key infrastructure projects in recent years have been the reconstruction of the M7 motorway Budapest (including the completion of the 3rd lane), completing the bridge in Dunaújváros and the Western bypass road in Székesfehérvár connecting the M7 and M8 motorways. In the coming years the region plans to develop the M8 motorway in its full length, build a bridge in Komáromand and reconstruct the Budapest Kelenföld – Székesfehérvár international railway line. All these initiatives will help with the development of the logistics service centre in Székesfehérvár

- **Innovation activity is mixed**. The region recorded 8.27 patent applications in 2007, significantly lower than the national average of patent applications (33.3) and the OECD average (430). In relation to its population, patent applications per million people (7.5) in 2007 was less than one-fifth of the national average of 17.3 and less than one-tenth the OECD average (85.6). Business R&D expenditure was 0.14% of GDP, almost half of the national average of 0.24% and significantly lower than the OECD average of 0.93%. Government R&D also trailed (0.12%) behind national (0.15%) and OECD standards (0.25%).

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.8 examines the integrated structure of several critical growth drivers identified in this section, allowing a more integrated picture to be displayed. Looking at the picture for Central Transdanubia as a whole, the region has adequate infrastructure. Low-skilled workers make up too large a proportion of its workforce

although the share of highly skilled ones is closer to the national average but also below. The region invests a lower proportion of public and private R&D than nationally and records lower innovation outputs than nationally.

Figure 3.8. **How drivers of growth compare to the national average, Central Transdanubia, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements in regions contributing to growth and development

A number of distinct factors have influenced the performance of the region.

- **Strong influx of FDI and foreign investors**. During the period 1999-2007, Hungary was among the earlier leaders in attracting FDI, with a cumulative inflow amounting to USD 39 727 million, the third largest of the Central and Eastern European countries and the second largest in *per capita* terms. Currently 45% of the net sales revenues of all companies goes to foreign-owned corporations. Foreign companies produce 43% of the country's total GVA, contribute 40% of overall investments and employ around 25% of the workforce. Along with West Transdanubia, Central Transdanubia is second only to Central Hungary in its share of foreign capital resources. The region's readiness to adapt to changing conditions has also been a key element to boosting its performance. On the other hand, the presence of large amounts of foreign capital might make the region more vulnerable to external shocks.
- **A strong business sector** combined with a good work culture during the restructuring phase has been another critical element. The influx of FDI into the region was largely driven by the private sector. In 2006 Central Transdanubia, West Transdanubia and Central Hungary saw the greatest contributions by the private sector, with commercial organisations generating approximately two-thirds of their overall GDP.

- **A favourable geographic location**, despite being fairly distant from Europe's core economic areas. Hungary's accession to the EU placed the region within two important development zones. On the one hand it is located on the Venice-Trieste-Ljubljana line, continuing its way towards Budapest giving access to the Mediterranean, on the other, the region is also close to the South Bavarian innovation zone extending the Vienna-Bratislava-Győr zone into Central Trans-danubia. Prague is also close and the accession of the Slovak Republic to the EU has enhanced the intensity of cross-border economic and institutional relations between Central Transdanubia and its Slovakian neighbours.

- **Fairly advanced infrastructure network.** The region has a higher motorway density than the country and OECD averages, both in relation to its population (0.23 compared to the national average of 0.13 and the OECD average of 0.20; Table 3.5) and in relation to its land area (23 compared to the national average of 14 and the OECD average of 22). The road network includes the M7 and M6 motorways providing quick access to the central and southern parts of the region, and the M1 motorway giving access to the northern parts. In addition the fairly advanced infrastructure and road network have also strengthened connections to Budapest. Finally, the region also has good main line railway connections.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (Table 3.5).

- **Innovation intensity in the region is relatively low.** The transition period attracted a few large foreign-owned firms to the region, while also creating a large share of Hungarian-owned SMEs. Currently there are few connections between the large innovative firms and the less innovative SMEs, forming an obstacle to innovative activities and knowledge transfer. There are also weak links between the higher education institutions, research institutes and enterprises and little business financing for start-ups. As a result the region lags the main science and technology indicators with lower patent intensity and R&D expenditure than either the national or the OECD average.

- **A high proportion of low-skilled workers.** The presence of low-skilled workers was an important element attracting foreign direct investment to the region, but currently many firms are forced to recruit their labour force elsewhere, in particular from the Slovak Republic. The links between the educational and the business sector are relatively weak creating problems of mismatch between the supply of labour and what the region's economy demands.

- **Red tape and regulatory burdens** were and remain a concern to many businesses in the region, with high administrative costs to businesses and slow administrative procedures. Furthermore the higher wage taxes and wage-related contributions in Hungary compared to in neighbouring countries were strong deterrents and an incentive to push businesses towards the grey economy.

Table 3.5. **Statistical summary, Central Transdanubia**

	Period	Central Transdanubia	Hungary	OECD	National gap	OECD gap
Levels						
GDP pc	1995	9 042	9 883	18 926	91%	48%
	2007	14 766	15 892	24 597	93%	60%
GDP	2007	16 333	102 076			
GDP share	1995	10.22%	n.a.			
Productivity	1995	25 348	28 208	44 513	90%	57%
	2007	34 997	40 701	54 713	86%	64%
Area (in km^2)		11 116	93 028			
Area share of national		11.95%				
Population	2008	1 104 841	10 045 401	3 481 456		
Population share	2008	11.00%	n.a.	n.a.		
Population density	2008	101	108	263		
Elderly dependency ratio	2008	22%	23%	21%		
Youth dependency ratio	2008	21%	22%	28%		
Motorway density (p)	2008	0.23	0.13	0.20		
Motorway density (a)	2008	22.87	13.69	21.91		
Primary attainment % LF	2008	15.8%	14.7%	27.4%		
Tertiary attainment % LF	2008	18.5%	20.1%	26.0%		
Unemployment rate	2008	5.8	8.5	6.3	-2.71	-0.5
Employment rate	2008	59.6	55.2	66.7	4.44	-7.1
Long-term unemployment	2008	2.16	4.0	2.4	-1.84	-0.2
Youth unemployment	2008	15.51	20.5	15.3	-4.98	0.2
Patent applications	2007	8.27	33.3	430.0		
Patents per million	2007	7.5	17.3	85.6		
R&D to GDP	2005	0.42%	0.63%	1.55%		
BERD to GDP	2005	0.14%	0.24%	0.93%		
GERD to GDP	2005	0.12%	0.15%	0.25%		
Changes						
GDP pc growth	1995-2007	4.17%	4.04%	2.2%		
GDP growth	1995-2007	4.04%	3.81%	2.8%		
Productivity growth	1995-2007	2.72%	3.10%	1.83%		
Population growth	1995-2008	-0.13%	-0.21%	0.6%		
WA population growth	1995-2008	0.00%	-0.08%	0.8%		
Elderly dependency (pp change)	1995-2008	4.47	0.03	2.50		
Youth dependency (pp change)	1995-2008	-6.78	-0.06	-6.28		
Primary education (pp change)	1999-2008	-0.93	-2.32	-6.09		
Tertiary education (pp change)	1999-2008	2.16	3.78	5.84		
Employment rate (pp change)	1999-2008	1.59	1.28	1.87		
Unemployment rate (pp change)	1999-2008	-0.25	1.18	-1.82		
Patents per million (pp change)	1995-2007	5.92	11.95	53.29		
R&D to GDP (pp change)	1999-2005	0.14	0.19	0.13		

Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age.

Source: OECD Regional Database (2011).

Chiapas, Mexico

Figure 3.9. **Chiapas, Mexico**

Regional category: Very large catching-up potential and growing below the national average

Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Chiapas encompasses nine smaller TL3 regions consisting of 118 municipalities. In 2008 its population was 4.46 million, around 4.18% of Mexico's total population. Its population density at 61 people per km^2 is slightly higher than the national figure of 54 and less than one-fifth of the average density of 263 in OECD TL2 regions. The region's location is quite peripheral to core markets in Mexico and North America, being located in the southwest of Mexico bordering with Guatemala and the Pacific Ocean to the south. Its neighbouring regions are Tabasco to the north, Oaxaca to the west and Veracruz to the

northwest. All three neighbouring regions have levels of GDP *per capita* of no more than 66% of the national average. The largest cities in the region are, in order of importance, its capital city Tuxtla Gutierrez (with 553 374 inhabitants), Tapachula (320 456), Ocosingo (198 637), San Cristobal de las Casas (185 833), Comitan (128 941), Chilon (109 402), Palenque (107 160) and Las Margaritas (103 403). Settlement patterns are quite polycentric around several medium-sized cities, home to 38.3% of the overall population. The majority of the region's population, 73%, live in rural communities, significantly higher than the average for Mexican TL2 regions of 54% and OECD TL2 regions of 45%. The complex natural geography of the region represents a challenge for internal accessibly between cities and to external markets.

Chiapas enjoys a rich historical heritage and is home to one of the largest indigenous populations in the country, with eleven[7] federally recognised ethnicities which have played an important role in the region's identity and development. The region's history has revolved around a number of conflicts, with occasional rebellions. The 1994 Zapatista rebellion in particular has had a significant effect on the region's performance in the recent years.

Mexico is a federal state with a two-tier system of sub-national government comprising of 31 states and 1 federal district (Mexico City) at the regional level and 2 412 municipalities at the local level. Chiapas contains 118 municipalities. Although Mexico is a federal country, its policy making remains quite centralised. There has been gradual devolution to the states and municipalities since the 1990s, but sectoral policies are largely designed at the federal level, presenting significant challenges in terms of co-ordination with lower levels of government. Public action thus tends to be fragmented and it is hard for regional and local governments to develop policies and programs tailored to their own needs and connected to national priorities.

Economic assessment

The taxonomy classifies Chiapas as a region with very large catching-up potential, growing below the national average. In 1995, GDP *per capita* was USD 3 051 in PPP, around 56% below the Mexican average and 84% below the OECD average in TL2 regions. Over the period 1995-2007, GDP *per capita* grew at a rate of 0.97%, more than one percentage point below the national rate of 2.08% and the average pace of growth in OECD TL2 regions of 2.2%. Consequently, the gap in GDP *per capita* has widened to 61% below the national average and 86% below the OECD value in 2007. The population in the region has increased at a rate of 1.48%, higher than the national rate of 1.17%, and more than twice as fast as in OECD TL2 regions. GDP growth overall, at 2.5%, was below the national pace of growth of 3.3% and the average pace of growth in OECD TL2 regions of 2.8%. This lagging behind is thus driven by a combination of faster population increases and slower GDP growth rates.

Below we summarise how the region performed compared to national and OECD averages for five key indicators. Figure 3.10 summarises its performance against the national average.

- **Productivity is low and shows no signs of catching up**. Productivity – measured by GDP per employee – stood at USD 8 476 in PPP in 1995, 55% below the national average and 81% below the average in OECD TL2 regions. During an eleven year-period, productivity grew at a rate of 1.30%, slightly below the national rate of 1.38% and below the rate of OECD TL2 regions of 1.83%. Consequently the

region's productivity levels remained 55% below national ones and its gap with respect to the OECD figures widened further, to 82% below. The region's low productivity and its failure to close the gap is partly driven by its heritage and desire to preserve traditional working methods which are primarily based on low levels of industrial activity and low-value added activities.[8]

- The region's economy has a relatively low level of primary activities, with agriculture, hunting and fishing activities contributing 8.4% of the region's value-added and mining contributing 1.1% in 2004. The contribution of industry was also relatively low, at 3.4%, while services generate 61% of the region's GDP, driven primarily by communal, personal and social services. These represent 31% of total value-added, highlighting the significance of public services by regional and municipal authorities to the region's overall economic activities. The public sector employs 37% of the total workforce and includes activities such as security, civil protection, social protection, and cultural and governmental services. This domination of the service sector and limited industrial activity is an important limitation to overall productivity and productivity gains.

- The region has a few consolidated clusters, such as the coffee clusters in parts of the region, however this sector is still in its infancy and focuses mainly in primary production of coffee seeds, dried processed beans and wet raw beans rather than consumer goods such as the production of instant coffee or processed filter coffee. Other clusters include banana and mango production. The extraction of hydrocarbons has potential in Chiapas, but remains underdeveloped. The region's production structure is closely related to income levels and consequently approximately 57% of the economically active population receives no more than the equivalent of twice the minimum wage. The informal economy has been growing swiftly in recent years, at a rate of around 13.5% over the period 1996-2003.

- **Labour market outcomes in the regions are mixed**. On the one hand the region's pre-crisis unemployment rate was 2.2% as opposed to the national rate of 3.0%. On the other hand, its employment rate of 58.0% was lower than the national average of 63.1% in 2007 and, more worryingly, has declined considerably, by 8.33 percentage points over the period 1996-2007, significantly more than the average in Mexican regions of 1.81 percentage points. Employment rates are now nine percentage points below the OECD average rates of 66.7%. Female participation in the active workforce was very low in 1995, at 26.5%, and concentrated mainly in primary sector activities (39.5%). The participation of women in the workforce has not advanced much and still stood below 30% in 2008. The decline of employment rates may partly reflect a rise in informal employment which has almost doubled in size from 281 280 to 530 171, over the period 2003 to 2008.

- **Human capital has made some gains but remains lagging.** Highly skilled workers – those with tertiary educational attainments – make up 12.3% of the workforce, lower than the average in Mexican regions and around half of the typical share of high-skilled workers in OECD TL2 regions. Chiapas also has a significantly higher share of low-skilled workers, which make up 76.5% of its labour force compared to a national average of 66.9% and 27.4% in OECD TL2

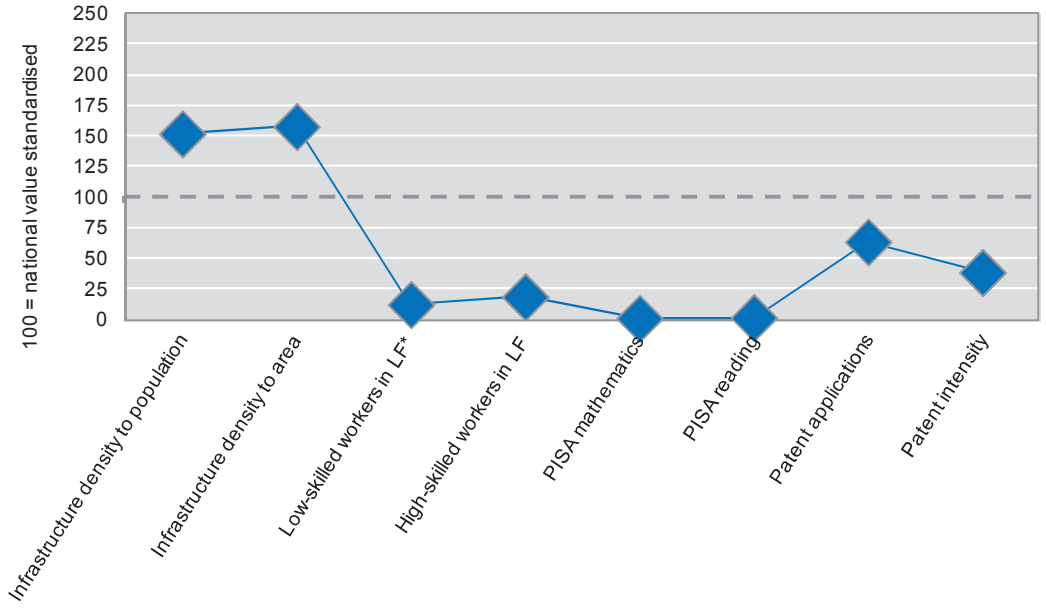
regions. In recent years these measures have improved. Between 1995 and 2008 Chiapas reduced the proportion of low-skilled workers in its labour force by 4.10 percentage points, and increased the proportion of highly skilled ones by 4.62 percentage points. Although these gains exceeded national rates of 0.05 pp and 0.04 pp respectively, the region remains considerably behind in this area. Furthermore the region's quality of human capital, captured by PISA scores, is still significantly below national and OECD standard and has improved at a slower rate than nationally (see Table 3.6).

- **Infrastructure stands above national standards with important gains in recent years.** In 2007, motorway density – measured by kilometres of motorway to its population – in Chiapas was 5.04, higher than the average value for Mexican regions of 3.22. In relation to its land area, motorway density, at 301.6, also surpasses national levels of 175.12. In recent years the region has modernised its port, railways and airport. The port, located in the south portion of the Pacific coast, has been upgraded with investments aimed at operating important commercial routes to Asia, the west coast of the US, Canada and South America. These investments have also brought an industrial park to the port of more than 2 million square meters. The region has two international airports, Tapachula and Angel Albino Corzo, connecting the region with various national and international destinations. Angel Albino Corzo airport is located 40 minutes from the centre of Tuxtla Gutierrez and has the most modern technology in the country, providing a wide range of services for the promotion of tourism and facilitating commerce. The region's airport has been a driver for activities in the entire region of Chiapas, especially tourism.

- **Innovation activity remains quite low in science and technology.** The region has fewer overall patent applications than the average for Mexican or OECD regions – 0.14 compared to 6.3 and 430.0 respectively. In relation to its population, patent intensity is effectively zero compared to the national average of 1.6 and the average in OECD TL2 regions of 85.6. Despite its low levels of formal science and technology indicators Chiapas has been quite innovative in creating economic value from its biodiversity through the operation of management units for the use and the sustainable conservation (UMAS). These units include extensive breeding centres for the propagation of fauna and flora-generated products. In 2002 Chiapas registered 22 UMAS. The biotechnological research centres responsible for research in this area are nationally known and have attracted many international researchers to these centres, giving rise to a significant number of high-tech commercial forestry plantations. In addition there have been efforts in the production of bio-energies such as bio-ethanol and bio-diesel.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.10 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region has above-average infrastructure density but important bottlenecks in all other key drivers for growth, in particular its human capital, with both low educational attainments and low overall quality.

Figure 3.10. **How drivers of growth compare to the national average, Chiapas, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); values have been standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of Chiapas.

- **The region's brand name has brought positive gains.** During the 1994 Zapatista movement, the region received considerable media coverage from the national and international media. Despite the negative perceptions often brought by conflicts, the brand name of the region actually increased as the coverage displayed its rich cultural and historical patrimony of customs, rituals, celebrations, traditions, ethnic diversity, archaeological monuments and buildings. All these elements have been important in attracting national and international visitors to the region. In 2003 the region was the third most visited region in Mexico injecting an estimated USD 201 million into the region's economy. Consequently the region considers tourism to be a key priority for the future.

- **The application of technology to the region's natural amenities**. Chiapas's 43 natural parks do not limit its growth potential; on the contrary they represent an opportunity for the region to capitalise on biodiversity through the operation of its 22 UMAS centres. Its biotechnological research has a national reputation, attracting researchers to these centres. The region has also created commercial forestry plantations using automated processes such as robotic sprinkler systems, creating the country's largest reforestation scheme. There have also been efforts to protect the environment by seeking substitutes for the cultivation of corn in areas which are environmentally unsuited to it. Reforestation has generated employment opportunities in planting, cultivation and packaging of plants. Fruit cultivation has increased productivity through the application of advanced production technologies. The region has also taken steps towards energy production with the development of bio-fuels like bio-ethanol and bio-diesel and capitalising on its natural conditions for the generation of solar, hydro-electrical

and tide and wave energy. These will require the modernisation of its communication infrastructure.

- **Natural tourism has been an important driver** of the region's value-added. The region possesses 30% of the country's surface water and has a rich natural heritage. Chiapas has the natural amenities to become a key player in this sector. With a land area 43.5% larger than Costa Rica, which leads the natural tourism sector in Latin American, Chiapas also has a large number of protected areas and a rich pre-Hispanic and colonial culture. Chiapas is well placed to attract not just eco-tourism but adventure tourism, cultural tourism, geo-tourism, rural tourism and sports tourism. Tourism-related activities have brought development and improved conditions to rural inhabitants, especially in indigenous and marginalised communities, through both direct and indirect spending on related services and products. Its consolidation and future growth largely depends on infrastructure improvements in the region's communication networks to increase capacity and assistance. Any impact on local development and communities will depend on the ability of groups of inhabitants organise and participate in natural tourism projects. In 2003, Chiapas designed seven tourist routes which integrated those communities and municipalities with high levels of natural attractiveness, cultural and historical monuments.

- **Infrastructure gains have benefited the region over the past decades.** Chiapas has made important steps towards improving it infrastructure network in recent years especially in modernising its port, its railways and its airport infrastructure. The port, located in the south of the Pacific coast, has been modernised capable of operating commercial routes to Asia, the west coast of the US, Canada and South-America. The port has brought a large industrial park to the region comprising of more than 2 million square meters. The region enjoys international airports including Tapachula and Angle Albino Corzo, providing communications with different destinations and routes regionally, nationally and internationally. This latter airport is located 40 minutes from the centre of the city Tuxtla Gutierrez and is one of the most modern in the country in terms of technology employed for its operation. The airports have helped promote the region's surging tourism sector.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (Table 3.6).

- **Economic activities are highly fragmented** with low links impeding scale effects**.** The region's economy is highly disconnected. On the one hand an important part of the economy depends on rurally based activities, reliant on subsidies and producing low value-added goods for the local and regional market. The exception is the coffee sector, with some exports, and banana and mango production, which mainly takes place in the smaller TL3 region of Soconusco. Tourism has also brought economic activity into rural areas. On the other hand there are important national investments targeting the generation of hydro-electric energy and the exploitation of hydrocarbons. These initiatives and projects are largely disconnected from the region's bottom-up initiatives and industrial structure, generating little local employment, establishing few links with educational facilities and having hardly any spillover effect into other sectors in the region.

- **Balancing traditional culture, social policies with development efforts.** After the Zapatista conflict, the region has put a great deal of effort into integrating the indigenous culture and population, many of which do not speak Spanish, are poor and marginalised, live in rural areas and have not adapted to modern production methods. Around 4.3 million inhabitants, 52% of the total population, live in rural regions. Approximately one-fourth of the region's population is indigenous, speaking 11 different languages, making it hard to integrate them into modern methods of production. Around 85% of the indigenous population is concentrated in the mountainous areas and forests. Chiapas has become the poorest region in Mexico since 2000, and the *per capita* income of the indigenous inhabitants is around 32% of the non-indigenous average. While social policies are needed for fighting poverty, development policies in Chiapas have been too concerned with social policies alone. These must be integrated with policies for growth to uplift critical areas such as human capital development and infrastructure.[9] Without further improvement to these critical areas, opportunities for the region's citizens in these areas will remain limited. Moreover, social policies can foster dependency among the citizens and regions receiving the transfers, with the risk that they perform below their potential.

- **There is a significant lack of human capital and loss of human potential** as children miss school to participate in farming activities, although there have been improvements in this area in recent years.[10] Chiapas records very low levels of human capital indicators with the lowest level of schooling among Mexican regions in 1997 and the highest level of illiteracy. Almost 40% of the population over 40 years of age cannot read and write.[11] Even getting to school is quite difficult in mountainous areas and in the in the jungle, while the dominant culture values young workers' agricultural labour over education. Currently the average number level of schooling in the region is only 6.6 years, and Chiapas records one the lowest levels of completion in the country with only 55.3% of the students in secondary school continuing to tertiary studies.

- **The region's terrain hampers development efforts**. The majority (79%) of the region is mountainous, a challenge to attempts to modernise its agriculture through capital-intensive production methods. The mountainous terrain also makes it harder to build internal connections such as roads and connect the region with the rest of the country. A large share of its territory is protected and cannot be used for productive activities according to environmental laws. In 1995 there were 14 natural protected areas totalling 1.9 million hectares and representing 17.4% of the country's protected areas. By 2007 the number had increased to 43. Between 70%-73% of Chiapas' territory is composed of forests, a total area of 5 million hectares. Furthermore it is vulnerable to adverse atmospheric phenomena, such as hurricanes, affecting its urban centres and its infrastructure network.

- **Inadequate infrastructure still represents an important bottleneck for development** despite recent gains. The region's road network is extensive but a large number of its routes are inadequate for heavy cargo increasing transport costs. The railway line extends only 510 kilometres along the Pacific coast without entering into the region's interior. The cargo port was ill-designed and not deep enough, requiring continuous maintenance which raises costs. The cargo volume in the port is quite limited due to insufficient connections and communications. The telephone network is also inadequate with 35 lines for each 10 000 inhabitants, against 152 in northern Mexican regions and 83 nationally in 2000. The airport infrastructure, during the period of analysis, did not yet include an air-cargo terminal and did not have enough capacity to meet the growing demand from tourism.

Table 3.6. **Statistical summary, Chiapas**

	Period	Chiapas	Mexico	OECD	National gap	OECD gap
Levels						
GDP pc	1995	3 051	6 879	18 926	44%	16%
	2007	3 425	8 808	24 597	39%	14%
GDP	2007	15 111	630 945			
GDP share	1995	1.62%	n.a.			
Productivity	1996	8 476	18 837	44 513	45%	19%
	2007	9 766	21 891	54 713	45%	18%
Area (in km^2)		73 681	1 959 244			
Area share of national		3.76%				
Population	2008	4 460 013	106 682 518	3 481 456		
Population share	2008	4.18%	n.a.	n.a.		
Population density	2008	61	54	263		
Elderly dependency ratio	2008	7%	9%	21%		
Youth dependency ratio	2008	56%	46%	28%		
Motorway* density (p)	2007	5.04	3.22	n.a.		
Motorway* density (a)	2007	301.65	175.14	n.a.		
Primary attainment % LF	2005	76.5%	66.9%	27.4%		
Tertiary attainment % LF	2005	12.3%	16.4%	26.0%		
PISA mathematics	2009	368	419	500		
PISA reading	2009	364	425	500		
Unemployment rate	2007	2.2	3.0	6.3	-0.84	-4.1
Employment rate	2007	58.0	63.1	66.7	-5.11	-8.7
Patent applications	2006	0.14	6.2	430.0		
Patents per million	2006	0.0	1.6	85.6		
Changes						
GDP pc growth	1995-2007	0.97%	2.08%	2.2%		
GDP growth	1995-2007	2.5%	3.3%	2.8%		
Productivity growth	1996-2007	1.30%	1.38%	1.83%		
Population growth	1995-2008	1.48%	1.17%	0.6%		
WA population growth	1995-2005	2.35%	1.89%	0.8%		
Elderly dependency (pp change)	1995-2008	1.27	0.01	2.50		
Youth dependency (pp change)	1995-2008	-20.31	-0.17	-6.28		
Primary education (pp change)	1995-2005	-4.10	-5.27	-6.09		
Tertiary education (pp change)	1995-2005	4.62	3.59	5.84		
PISA Mathematics (pp change)	2003-2009	12.00	33.52			
PISA Reading (pp change)	2003-2009	7.00	25.19			
Employment rate (pp change)	1996-2007	-8.33	1.81	1.87		
Unemployment rate (pp change)	1998-2007	0.78	1.06	-1.82		
Patents per million (pp change)	2003-2006	-0.28	0.83	53.29		

Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area. * Motorway data for Mexico includes motorways and secondary roads.

Source: OECD Regional Database (2011).

Durango, Mexico

Figure 3.11. **Durango, Mexico**

Regional category: Catching-up potential and growing above the national average

Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Durango encompasses nine smaller TL3 regions consisting of 39 municipalities. Its population in 2008 was 1.54 million, representing 1.45% of the Mexican population. Its population density is 13 people per km^2, lower than the national average of 54. The region is located in the northwest part of Mexico, neighbouring Chihuahua to the north, Coahuila to the northeast, Zacatecas to the southeast, Nayarit to the southwest and Sinaloa to the west. The largest cities are Durango, the state capital, with 582 267 inhabitants in 2010, Gomez Palacio (328 159) and Ciudad Lerdo (143 206). Around one-third of the region's

population live in the capital city Durango while the Laguna area, which includes the municipalities of Gomez Palacio and Lerdo, hosts another third. Settlement patterns are thus quite polycentric around these two poles, and the region's economy reflects this. The two poles together concentrate 69% of the region's overall population, while the remaining 31% are spread out around the remaining territory which is mainly rural. The region has a dry and semi-dry climate, and its territory consists of three mountainous areas and a single central plateau, providing Durango with rich natural resources, mainly natural forests and minerals.

Durango has experienced two significant shocks to its economy in recent decades. Mexico's economy-wide import substitution model of industrialisation was drastically dismantled in the 1980s and then the NAFTA treaty was signed in 1994. This new economic context generated a number of *maquiladora*[12] activities that benefitted not only the northern frontier but also a number of regions and cities located in the central and northern parts of the country. At first, after the NAFTA treaty was first implemented, the bulk of *maquiladoras* located in Mexico's northern regions. Later on, due to fierce wage and labour competition, Durango and other interior regions were able to provide lower costs and therefore attracted a second wave of activity to their borders. The NAFTA treaty has also opened an important export market to Durango.

Mexico is a federal state with a two-tier system of sub-national government comprising 31 states and one federal district (Mexico City) at the regional level and 2 412 municipalities at the local level. Although Mexico is a federal country, its policy making remains quite centralised. Since the 1990s there has been a gradual devolution to the states and municipalities but sectoral policies are largely designed at the federal government level, making co-ordination with lower levels of government a challenge. In the absence of effective co-ordination mechanisms, both between different levels of government and across sectors, policy making at the regional and local scale in Mexico is highly fragmented, making it hard to design strategies and policies tailored to local needs.

Economic assessment

The taxonomy classifies Durango as a region with catching-up potential, growing above the national average. In 1995, GDP *per capita* was 5 783 USD in PPP, around 16% below the Mexican average and 69% below the OECD average in TL2 regions. Over the period 1995-2008, GDP *per capita* grew at a rate of 2.59%, outperforming the national rate of growth of 2.08% and the average growth in OECD TL2 regions of 2.2%. Consequently, the gap in GDP *per capita* with the rest of the country closed over this period by five percentage points to 11% below the national average, and 68% below the OECD average. Population in the region increased by 0.65%, a similar pace to the OECD average of 0.6%, at a time when population among Mexican regions on average increased by 1.17%. GDP growth overall was 3.3%, identical to the national rate and above the rate in OECD TL2 regions of 2.8%. Therefore the region has been catching up partly due to its GDP growth and not just through relative population decline.

Below we summarise how the region performed compared to national and OECD averages for five key indicators. Figure 3.12 summarises its performance against the national average.

- **Productivity is catching up.** Productivity – measured by GDP per employee – stood at USD 18 174 expressed in PPP in 1996, 4% below the national average of 18 837, and significantly below the average productivity in OECD TL2 regions of 44 513. From 1996-2007, productivity grew in the region at a rate of 1.55%, higher than the average pace of growth of all Mexican regions of 1.38% but slightly below the average productivity growth among OECD TL2 regions. Consequently the region had closed the productivity gap with respect to national levels to just 2% below the national average by 2007, although with respect to OECD regions the gap increased further to 61% below the average.

  - The region's economy is dominated by the manufacturing industry, which contributes 23% of GDP, followed by mining (21%), trade (14%) and agriculture and forestry (12%). The remaining 30% consists of various services. The presence of the *maquiladora* industry in Durango has been influenced by the region's relative proximity to the northern border. The region's *maquiladoras* mainly specialise in textile, clothing and some metalworking with an ongoing structural change towards automotive manufacturing activities in recent years. Most of the industrial activity is concentrated in the cities of Durango and Gomez Palacio. Durango specialises in timber processing and mining, while Gomez Palacio focuses on traditional activities including food, textiles, wood, publishing and printing, chemicals, non-metallic minerals, and a car assembly plant. The municipality of Lerdo specialises in farming and agribusiness and is home to one of the most important dairy clusters in the north of the country. Recently Lerdo has also seen an increase in *maquiladora* activities.

- **Labour market outcomes are below national standards.** The pre-crisis unemployment rate in 2007 was 3.6% compared to the average for Mexican regions of 3.0%. The employment rate was 59.6%, below the Mexican average of 63.1%. More worryingly, the unemployment rate increased 1.93 percentage points over the period 1998-2007, against an increase of 1.06 pp on average for the Mexican regions while the employment rate has been decreasing by 0.5 pp at a time when it increased on average in Mexican regions by 1.8 pp.

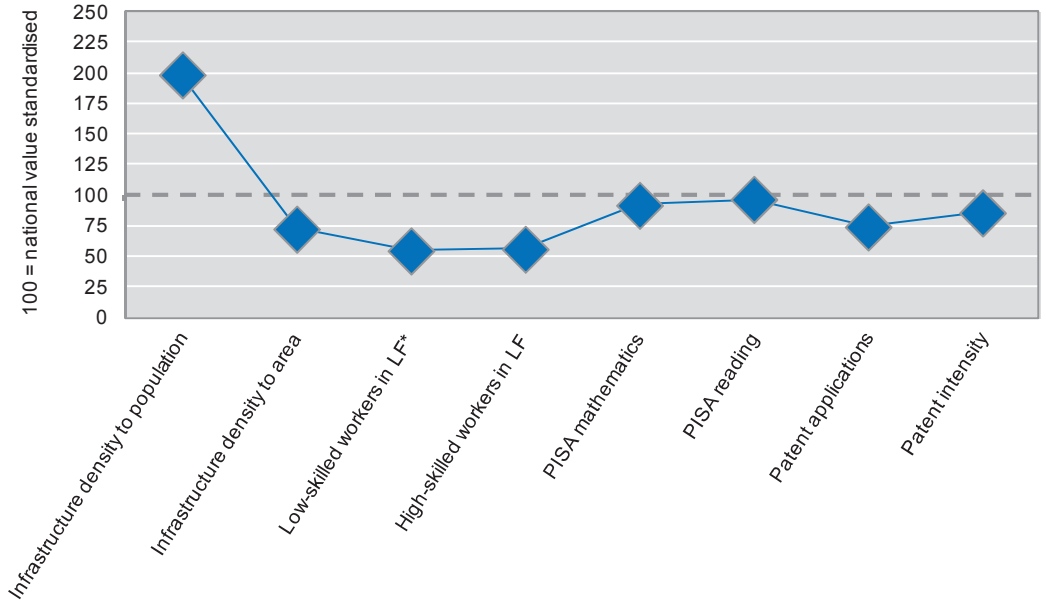
- **Human capital improvements have been significant but still lag behind national standards**. Over the period 1995-2005, Durango reduced the proportion of low-skilled workers – those with only primary education attainments – in its labour force by 5.62 percentage points, and increased the proportion of highly skilled ones – those with tertiary educational attainments – by 2.56 pp. These gains exceeded national changes for low skilled workers (-5.27) and were slightly below the national change for high skilled workers (3.6). Despite this, by 2005 70.7% of the workforce in the region was still classed as low skilled, while only 14.6% was classed as highly skilled, poorer figures than nationally. In terms of PISA scores, the region has also made significant improvements over the period 2003-09, increasing its mathematics scores by 48 and its reading scores by 40, exceeding the average gains in Mexican regions of 33.5 and 25 respectively. As a result, the region's PISA scores in these areas are now around the national average (417 and 425 as opposed to the national average of 419 and 425). In terms of years of schooling, the average in Durango is 8.6 years, around the national average, but below the level in Estado de México, with 9.1 years and Jalisco, with 8.8. On average 18% of the population complete upper secondary education and 14% complete higher education.

- **Infrastructure surpasses national standards.** In 2005, motorway density – measured by kilometres of motorway to its population – in the region was 9.62, well above the average value for Mexican regions of 3.22. In relation to its land area, the region's motorway density was 120, below the average value in Mexican regions of 175; typically motorway density tends to be higher in smaller and more densely populated regions. The region's road network consists of 14 768 kilometres of road, more than the average in Mexican regions of 11 252. The region has adequate rail connections with the northern region of Chihuahua providing an important transportation route for the mining and timber sector towards the northern markets of the US and Canada. The capital has an international airport with frequent flights to Chicago and to Los Angeles.

- **Innovation activity remains below national standards.** The region had 2 overall patent applications, compared to the average in Mexican regions of 6.3 and in OECD TL2 regions of 430.1. In relation to its population, patent intensity is 1.3 per million inhabitants, only slightly below the average value for Mexican regions of 1.6 but substantially lower than the average in OECD TL2 regions of 85.6.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.12 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region has adequate levels of infrastructure in relation to its population. Human capital indicators are slightly below national average values and innovation activity is also slightly lower than the national average.

Figure 3.12. **How drivers of growth compare to the national average, Durango, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influence Durango's performance:

- **The combination of natural resources, improvements in infrastructure connections and close links with northern markets** has been an important source of growth for Durango. The region has the largest timber reserves in the country and the main forest reserve, giving rise to industrial activities around sawmills and furniture. The regional also enjoys the presence of a great variety of metallic mineral resources (gold, silver, cadmium, copper, iron, lead, zinc) and non-metallic resources (bentonite, calcite, dolomite, fluorite, clay, plaster) providing economic activities and employment opportunities in semi-desert areas. The presence of these natural resources, supported by adequate rail infrastructure to the US and close links with northern partners have driven exports in the region.

- **The largest dairy cluster in the north of Mexico**. An important dairy industry cluster has been established around the area of La Laguna, providing one of the most important and modern milk supply sources in the country. This activity is integrated into a cluster which includes various activities further up the value chain.

- **Cross-regional linkages with its neighbouring region of Coahuila,** especially in the industrial and agricultural sectors. The Laguna area (Gómez Palacio and Lerdo) is closely linked with the municipalities in Coahuila, one of the most dynamic regions in the entire country. These links have been an important driver for the agricultural industry, the textile, metallurgical and chemical industries, and trade and services for Durango.

- **Gains in human capital capacity building and in vocational training**. The federal government made significant transfers to the region during the period 1996-2005, using funds for basic and normal education, health, social infrastructure, strengthening of the municipalities, and adult education in technology and public safety. These funds have been important for improving human capital and capacity in the region. During this period human capital indicators for the region have improved faster than nationally. In 1995 there were already 23 training centres for work-oriented activities such as electronics, machinery and tools, auto maintenance, secretarial, carpentry and so on, linked with the main industries in the region.

- **The combination of road and rail infrastructure and geographic location** has enhanced commercial flows toward external markets. The existing communication infrastructure and the region's strategic location close to its northern markets have allowed the region to keep up the traditional flow of goods to the North American market and to the main consumption centres in the north.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.7).

- **Lack of economic diversity and reliance on agricultural activities and natural resource**. Agricultural activities in this part of the country are vulnerable to climatic conditions with recurrent periods of droughts and frost bringing high levels of mortality to livestock. Periods of cold weather in the winter time can cause significant losses in the agricultural sector. Insufficient livestock disease controls and nontariff barriers limit the export of cattle to the US and bring uncertainty to the agricultural community. The mining sector is also vulnerable to fluctuations and uncertainty in international markets. Mining activities in Durango were particularly affected by the international crisis which hit global markets for both metallic and non-metallic minerals.

- **Enhanced competition by Asian importers**. Between 75% and 80% of the national consumer market for wood is imported from the Asian market, particularly China. The enhanced competition and resulting lower prices represents an important challenge for the region.

- **Demographic trends represent a loss of human capital potential**. The proximity of the region to more developed municipalities from Coahuila, Chihuahua and Nuevo Leon, where there are more opportunities and higher wages are available, induce outmigration flows, particularly of skilled labour and professionals. Approximately 69% of the skilled workforce graduating from vocational centres with medium to medium-high qualifications migrated to cities outside of the Durango region. Furthermore, national transfers are driven by population size and in the case of Durango they have been decreasing in recent years (see Table 3.7). This decline puts Durango's capacity to engage in public investment activities at risk.

- **Insufficient integration of the mining and timber value chains** represent important obstacles to producing higher value added goods. There are still no consolidated clusters in the mining and wood production sectors and the region's focus is mainly on primary activities. This is preventing the region from moving up the value chain into higher value-added goods and improving its innovation activities. Better links between the private, public and educational institutions would help to achieve this.

- **Inadequate logistics infrastructure**. During the period 1995-2005 the region still did not have a logistical and industrial centre, a new railroad station, an internal border control, a multimodal centre or the strategic road connecting Durango with the port of Mazatlan in the Pacific coast. Its air-cargo infrastructure also lacks sufficient capacity.

Table 3.7. **Statistical summary, Durango**

	Period	Durango	Mexico	OECD	National gap	OECD gap
Levels						
GDP pc	1995	5 783	6 879	18 926	84%	31%
	2007	7 856	8 808	24 597	89%	32%
GDP	2007	12 085	630 945			
GDP share	1995	1.30%	n.a.			
Productivity	1996	18 174	18 837	44 513	96%	41%
	2007	21 530	21 891	54 713	98%	39%
Area (in km^2)		123 367	1 959 244			
Area share of national		6.30%				
Population	2008	1 544 614	106 682 518	3 481 456		
Population share	2008	1.45%	n.a.	n.a.		
Population density	2008	13	54	263		
Elderly dependency ratio	2008	9%	9%	21%		
Youth dependency ratio	2008	50%	46%	28%		
Motorway* density (p)	2007	9.62	3.22	n.a.		
Motorway* density (a)	2007	119.96	175.14	n.a.		
Primary attainment % LF	2005	70.7%	66.9%	27.4%		
Tertiary attainment % LF	2005	14.6%	16.4%	26.0%		
PISA mathematics	2009	417	419	500		
PISA reading	2009	424	425	500		
Unemployment rate	2007	3.6	3.0	6.3	0.56	-2.7
Employment rate	2007	59.6	63.1	66.7	-3.50	-7.1
Patent applications	2006	2.00	6.2	430.0		
Patents per million	2006	1.3	1.6	85.6		
Changes						
GDP pc growth	1995-2007	2.59%	2.08%	2.2%		
GDP growth	1995-2007	3.3%	3.3%	2.8%		
Productivity growth	1996-2007	1.55%	1.38%	1.83%		
Population growth	1995-2008	0.65%	1.17%	0.6%		
WA population growth	1995-2005	1.41%	1.89%	0.8%		
Elderly dependency (pp change)	1995-2008	1.47	0.01	2.50		
Youth dependency (pp change)	1995-2008	-17.98	-0.17	-6.28		
Primary education (pp change)	1995-2005	-5.62	-5.27	-6.09		
Tertiary education (pp change)	1995-2005	2.56	3.59	5.84		
PISA Mathematics (pp change)	2003-2009	48.00	33.52			
PISA Reading (pp change)	2003-2009	40.00	25.19			
Employment rate (pp change)	1996-2007	-0.56	1.81	1.87		
Unemployment rate (pp change)	1998-2007	1.93	1.06	-1.82		
Patents per million (pp change)	1995-2006	1.07	0.83	53.29		

Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age, p = population; a = area. * Motorway data for Mexico includes motorways and secondary roads.

Source: Calculations based on *OECD Regional Database* (2011).

Estado de México, Mexico

Figure 3.13. **Estado de México, Mexico**

Regional category: Catching-up potential and growing below the national average

Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

This region[13] encompasses five TL3 regions: the conurbation adjacent to the commuter Distrito Federal belonging to a single catchment area (71.5% of the region's GDP and 7.5% of its inhabitants); the urban corridor Toluca-Lerma (25.6% of GDP and 13.5% of inhabitants); and the three others centred on Atlacomulco, Ixtapan de la Sal/Tejupilco and Valle de Bravo (6% of GDP and 12% of inhabitants).

In 2008 the region's population was 14.6 million, around 13.7% of the national population. The region's total surface area (22 357 square kilometres) represents a smaller share of the national surface land area (1.14%); therefore population density in the region is significantly higher (655) than nationally (54) and on average in OECD TL2 regions (263). The region is located in the centre of Mexico. Its neighbouring regions are Hidalgo to the northeast, Queretaro to the north, Michoacan to the west, Guerrero to the south, Tlaxcala to the east, and Morelos and Puebla to the southeast. The region Distrito Federal is located in the middle of region sharing most of its borders with Estado de México, and the catchment area of Distrito Federal extends beyond its administrative borders covering a significant proportion of the territory in Estado de México. There are two main metropolitan areas, the metropolitan area of Mexico City (maMC), also known as the metropolitan zone of the Cuautitlan/Texcoco valley, and the metropolitan area in the valley of Toluca (*region centro* Toluca). The rest of the region comprises rural areas and small urban centres. The maMC itself is home to 18.6 million inhabitants and extends over two administrative authorities; 47%, or 8.8 million people, live in the Distrito Federal while 53%, or 10.5 million people, live in the Estado de México. This metropolitan area is the second largest in the OECD after Tokyo, with a population of 33 million. The second metropolitan area around the valley of Toluca had a population of 1.9 million in 2005. The region's structure is thus monocentric, given the dominance of the maMC. Only 8% of the region's population live in rural communities; significantly lower than the average for Mexican regions (54%) and OECD TL2 regions (45%).

The region has experienced two important shocks to its economy in recent decades. First the ending of the import substitution model during the late 1980s and early 1990s brought with it the phasing out of protectionist policies and a process of structural transformation aimed at gradually transitioning from a closed economy to a fully open market economy, with more emphasis on exports and the attraction of foreign direct investment (FDI). The region's heavy reliance on the internal market means it suffers from a high commercial deficit driven by imports. The opening of markets over a relatively short period of time was a significant shock to firms in the region. These firms were mainly focused on the internal market, and had to very quickly become competitive in international markets at a time when subsides were being phased out (from the 1980s to 1994). Many local firms were unable to adapt to these changing conditions, killing off a significant part of the region's productive structure. The second important shock came with the NAFTA treaty in 1994, which had a favourable effect on the northern Mexican regions due to their proximity to the United States (US) markets. They enjoyed an important comparative advantage due to their lower costs, making this period a dynamic time for these regions, especially for manufacturing based activities.

Mexico is a federal state with a two-tier system of sub-national government. It comprises 31 states and one federal district (Mexico City) at the regional level and 2 412 municipalities at the local level. Estado de México contains 125 municipalities. Although Mexico is a federal country, its policy making remains quite centralised. There has been gradual devolution to the states and municipalities since the 1990s, but sectoral policies are largely designed at the federal government level, making co-ordination with lower levels of government difficult. In the absence of any effective co-ordination mechanisms, both between different levels of government and across sectors, policy making at the regional and local scale in Mexico is highly fragmented, making it hard to design strategies and policies tailored to local needs.

Economic assessment

The taxonomy classifies Estado de México as a region with catching-up potential, growing below the national average. In 1995, GDP *per capita* was USD 5 462 in PPP, around 21% below the national average and 71% below the average value in OECD TL2 regions. Over the period 1995-2007, GDP *per capita* grew at a rate of 1.14%, almost one percentage point below the national average of 2.08%, and the average in OECD TL2 regions of 2.2%. Consequently the gap in GDP *per capita* increased further, falling to 29% below the national average and 75% below the OECD average in 2007. Population in the region increased from 11.6 million in 1995 to 14.6 million in 2008, a rate of 1.81%, more rapidly than the Mexican average of 1.17% and the OECD average of 0.6%. GDP growth at 3.0% was below the national pace of growth of 3.3% but surpassed the average pace in OECD TL2 regions of 2.8%. Although in absolute terms, growth in the region has been more dynamic than the OECD average, this has been undermined by high population inflows. The region remains an important driver of national growth due to its large size and dynamism. Over the period 1995-2007, the region was Mexico's third largest contributor to aggregate GDP growth adding 8.98% of national output, second only to the Distrito Federal (18.8% of aggregate growth) and Nuevo Leon (9.3%). Its contribution to aggregate growth is smaller than its GDP share of 9.7%, suggesting the region's size is stronger than its dynamism.

Below we summarise how the region performed compared to national and OECD averages for five key indicators. Figure 3.14 summarises its performance against the national average.

- **There is room for improving productivity.** Productivity[14] – measured by GDP per employee – stood at USD 15 921 in PPP in 1996, 15% below the national level of 18 837 and 64% below the OECD average. From 1995 to 2007, productivity in the region contracted by 0.01% at a time when it increased nationally by 1.38% and in the OECD by 1.83%. Consequently the productivity gap has increased, falling to 27% below national levels and 71% below OECD ones. Productivity, as measured by GDP, partly depends on the structure of the regional economy, which in Estado de México is highly dependent on manufacturing. This makes up 30.7% of the region's value-added, followed by commerce, hotels and restaurants (21.6%); financial services, insurance and renting (15.7%); and social and personal services (14.7%). The manufacturing sector in the region experienced a crisis during 2001-03 as a result of an overall drop in global demand combined with the region's slower modernisation and technological innovation to meet the demands of the international markets in particular with technological innovation. The regional authorities reacted slowly and only made competiveness a core pillar of the region's economic development strategy in 2006. Due to the importance of manufacturing in the region's economy these factors had a particularly adverse effect on overall productivity. Indeed over the period 2000-06, manufacturing was the sector with the smallest contribution to overall growth, adding only 0.44% of the 3.15% increase. The largest contributions were provided by commerce, hotels and restaurants (adding 0.95 percentage points), transport, storage and communications (0.93 pp) and financial services, insurance and renting (0.66 pp). The region's main clusters are, in order of importance, the automobile cluster including car-parts, the textile and clothing cluster and the food-processing and drinks cluster.
- **Labour market outcomes trail the national average.** The region’s unemployment rate in 2007 was 4.1%, compared to the national average of 3.0%, while the employment rate was 59.2% as opposed to 63.1% nationally. Over the period 1996-2007 the employment

rate[15] in Estado de México declined by 0.24 percentage points at a time when it increased nationally by 1.81 pp. The decline partly results from an ongoing restructuring process brought by the demise of many firms unable to compete in international markets and consequently reducing the number of formal jobs available in the region as well as real incomes which have been declining since the 1970s. An important element affecting the region's labour market performance has been the gradual loss of manufacturing productivity and with it employment in manufacturing. This has had a multiplier effect in the region, given that 70% of the workforce is employed in the service sector, which is very interlinked with, and therefore vulnerable to, losses in manufacturing. These figures, based on administrative measures do not account for travel to work relationships of workers living in Estado de México and working in Mexico D.F. A measure of labour market based on functional areas will likely reflect better labour market performance.

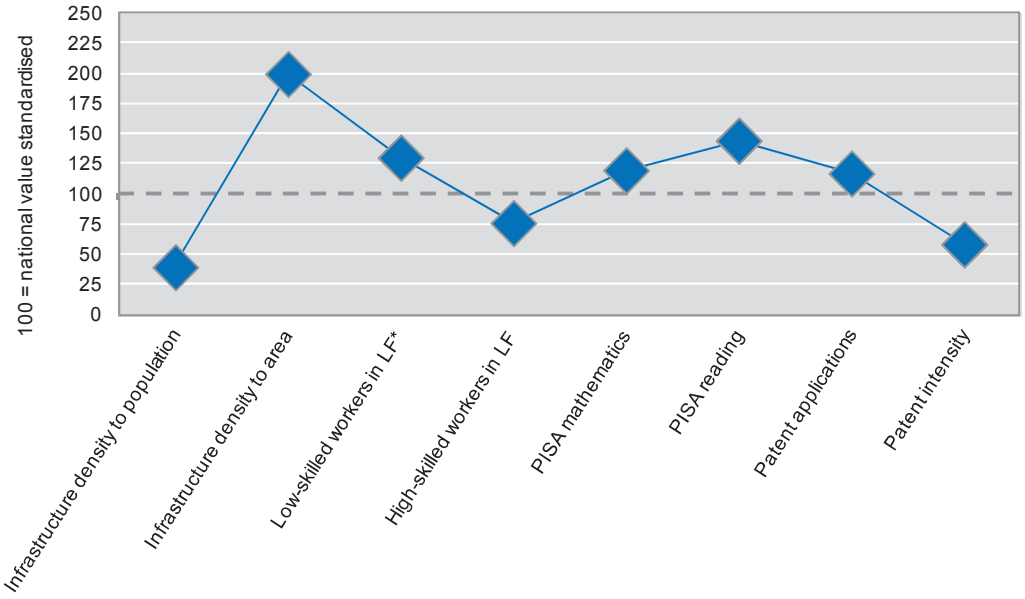
- **The region has made important gains in human capital** although challenges remain in adding more highly skilled workers. On the one hand the proportion of low-skilled workers – those with only primary education attainments – in the workforce is 64.5%, lower than the national average of 66.9% but more than double the OECD average. On the other hand the region has a smaller proportion of highly skilled workers in its labour force: 15.5% compared to the national share of 16.4% and the OECD average of 26%. Despite this, the quality of its human capital exceeds national values, recording higher PISA scores in mathematics (424) and in reading (440) in 2009. During 2003-09 the region's PISA scores increased by 39 points in mathematics and 37 points in reading, outperforming national improvements of 33.5 and 25 points respectively.

- **Big efforts of infrastructure investment but still not enough to face the challenge of population growth.** Infrastructure density in 2007 measured by kilometres of motorway to surface area in the region (660) surpassed the national average (175) by more than three times, however in relation to its population, motorway density (1.02) was below the average value in Mexican regions (3.22) in 2007 due the strong population influx experienced by the region.

- **Innovation activity is mixed.** Overall there were 8.92 patent applications in the region, higher than the Mexican average of 6.2 but in relation to its size this figure is relatively low. The region's contributed 5.4% of Mexico's total patents,[16] lower than its relative economic size, at 9.7% of total GDP, would predict. Other regions with smaller economies such as Nuevo Leon (7.5% of GDP) and Jalisco (6.2% of GDP) recorded more overall patents (19 and 49 respectively in 2007). Patent intensity in the region – patent applications per million – is 0.6, below the national average (1.6) and significant below the average for OECD TL2 regions (85.6). Innovation-related activates in the region still do not play the sort of central role in overall growth performance that they could, especially accelerating the restructuring process and modernising the region's productive structure.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.14 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region has important bottlenecks in infrastructure relative to its population size but not to its land area. It is also relatively weak in its levels of highly-skilled workers and innovation intensity. Its strength lies in its quality of human capital, and the lower proportion of low-skilled workers to its labour force than nationally.

Figure 3.14. **How drivers of growth compare to the national average, Estado de México, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of Estado de México:

- **The region's attractiveness** has been an important driver both in terms of attracting population and FDI investments. The presence of a strong industrial cluster provides a diverse range of job opportunities and its proximity to Mexico City has made Estado de México and important destination for internal migrants during the last decades.
- **Significant FDI investments.** The region has the third largest stock of FDI among Mexican regions over the period 1995-2005, despite being relatively far from the northern border and the US market and despite having a strong focus on the internal market. The government has played an important role in attracting investments to the region by engaging in commercial missions in Guatemala and Cost Rica earlier and more recently in Europe and in the United States. An important sector for FDI for the region has been the food and drink industry.
- **Proximity to the main consumer hub in Mexico.** The region is privileged by its proximity to Mexico's main internal market around the metropolitan area of Mexico City, home to 15% of the national population and providing a critical mass of consumers. The region also shares with the Distrito Federal a privileged position in terms of logistics and traditional distribution centres which give access to a large proportion of the national territory. Proximity to the Distrito Federal has also brought important spillover effects to the region attracting a large number of firms due to Estado de México's lower costs in providing services, lower rental and land-use costs and good connections to the Distrito Federal.
- **The presence of a significant number of larger firms drives the region's manufacturing cluster**, one of Mexico's most important. The region has attracted a significant number of large firms (employing more than 100 workers) around the Toluca-Lerma industrial corridor,

attracting an even larger number of SMEs and increasing the role of manufacturing in the region's overall output. At a time when manufacturing declined in both the Distrito Federal and nationally, it has maintained its relative significance in the region. In 1993 the value-added by manufacturing in the Distrito Federal was 18.58% higher than in Estado de México but by 1999 it was only 13.25% higher. The region's contribution to national manufacturing value-added, at 16%, is quite significant and much higher than the size of its economy. Within manufacturing the key sub-sectors are metallic products, machinery and equipment which together generate around one third of the manufacturing value in the region.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.8).

- **The demographic effect of high population growth**. Mexico's early industrialisation was concentrated on large numbers of nationally owned SMEs in the Distrito Federal which subsequently attracted national and international larger firms to Estado de México during the 1960s and 1970s. Ever since, both regions have been destinations of migrants in search of jobs and opportunities, increasing the population size of the metropolitan area of Mexico City by a factor of five since the 1950s. Estado de México not only attracts migrants in search of employment opportunities in its own right but also attracts significant numbers of workers employed in the Distrito Federal, due to its cheaper housing and good public transport links. There are many commuters working in Distrito Federal; unsurprisingly the most populated areas in the region – Ecatepec, Nezahualcóyotl, Naucalpan and Tlalnepantla – are adjacent to the Distrito Federal. This inward migration brings important urban and spatial planning challenges. In sum the region has not been able to fully absorb incoming migrants into productive activities. Around 200 000 new residents are estimated to arrive each year, many of whom have no formal employment and relatively low educational standards. All these factors have been responsible for dragging productivity gradually downward in the region.
- **Slow reaction to external shocks and partial implementation of much needed structural transformation.** The end of the import substitution model meant the phasing out of protectionist policies and more emphasis on exports and attracting FDI. Many firms were ill-prepared to face this transformation and compete internationally due to their heavy reliance on subsides and focus on internal markets. Northern regions responded much better to this change and the regional authorities reacted relatively slowly, only placing competitiveness as a key pillar in the region's economic development strategy in 2006, significantly later than the period of structural transformation in the mid-1990s.
- **Shortages of highly skilled labour during the period of analysis**. The region in 2005 had a smaller proportion of high-skilled workers to its labour force (15.5%) than on average in other Mexican TL2 regions (16.4%) and in OECD TL2 regions (26%). Improving the stock of highly skilled workers in the region's workforce is critical for productivity gains and it must go hand in hand with improving links between higher educational institutions and the business community in order to ensure research advancements are relevant to the demands of the region. This area is critical to uplifting the region's innovation intensity and accelerating the process of modernising the region's productive structure. The region has made important progress in this area in recent years.

Table 3.8. **Statistical summary, Estado de México**

	Period	Estado de México	Mexico	OECD	National gap	OECD gap
Levels						
GDP pc	1995	5 462	6 879	18 926	79%	29%
	2007	6 256	8 808	24 597	71%	25%
GDP	2007	90 309	630 945			
GDP share	1995	9.69%	n.a.			
Productivity	1996	15 921	18 837	44 513	85%	36%
	2007	15 905	21 891	54 713	73%	29%
Area (in km^2)		22 357	1 959 244			
Area share of national		1.14%				
Population	2008	14 638 436	106 682 518	3 481 456		
Population share	2008	13.72%	n.a	n.a		
Population density	2008	655	54	263		
Elderly dependency ratio	2008	7%	9%	21%		
Youth dependency ratio	2008	43%	46%	28%		
Motorway* density (p)	2007	1.02	3.22	n.a		
Motorway* density (a)	2007	659.93	175.14	n.a		
Primary attainment % LF	2005	64.5%	66.9%	27.4%		
Tertiary attainment % LF	2005	15.5%	16.4%	26.0%		
PISA mathematics	2009	424	419	500		
PISA reading	2009	440	425	500		
Unemployment rate	2007	4.1	3.0	6.3	1.12	-2.2
Employment rate	2007	59.2	63.1	66.7	-3.96	-7.5
Patent applications	2006	8.92	6.2	430.0		
Patents per million	2006	0.6	1.6	85.6		
Changes						
GDP pc growth	1995-2007	1.14%	2.08%	2.2%		
GDP growth	1995-2007	3.0%	3.3%	2.8%		
Productivity growth	1996-2007	-0.01%	1.38%	1.83%		
Population growth	1995-2008	1.81%	1.17%	0.6%		
WA population growth	1995-2005	2.55%	1.89%	0.8%		
Elderly dependency (pp change)	1995-2008	1.47	0.01	2.50		
Youth dependency (pp change)	1995-2008	-16.16	-0.17	-6.28		
Primary education (pp change)	1995-2005	-4.92	-5.27	-6.09		
Tertiary education (pp change)	1995-2005	2.97	3.59	5.84		
PISA Mathematics (pp change)	2003-2009	39.00	33.52			
PISA Reading (pp change)	2003-2009	37.00	25.19			
Employment rate (pp change)	1996-2007	-0.24	1.81	1.87		
Unemployment rate (pp change)	1998-2007	0.52	1.06	-1.82		
Patents per million (pp change)	1995-2006	0.41	0.83	53.29		

Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area. * Motorway data for Mexico includes motorways and secondary roads.

Source: OECD Regional Database (2011).

Jalisco, Mexico

Figure 3.15. **Jalisco, Mexico**

Regional category: Catching-up potential and growing above the national average

Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map**.**

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Jalisco encompasses ten smaller TL3 regions, consisting of 125 municipal units. Its population in 2008 was 6.96 million, representing 6.52% of the Mexican population. Its population density is 89 people per km^2, higher than the average for Mexican regions of 54. The region is located in the central western part of Mexico, neighbouring Nayarit, Zacatecas and Aguascalientes to the north, San Luis Potosi and Guanajuato the east, and Michoacan and Colima to the south. To the west is 342 km of Pacific coastline. The largest city is Guadalajara, which is also the capital of the

state and has 4.27 million inhabitants, over half of Jalisco's population. Guadalajara and its metropolitan area extend over 2423 km^2. The region is quite monocentric and concentrated around Guadalajara.

Jalisco has experienced two significant shocks to its economy in recent decades. Mexico's economy-wide import substitution model of industrialisation was drastically dismantled in the 1980s and then the NAFTA treaty was signed in 1994. This new economic context generated a number of *maquila* activities that benefitted not only the northern frontier but also a number of regions and cities located in the central and northern parts of the country. This was the case for Jalisco's electronics industry, which came to generate over 60% of the region's exports in just a few years.

Mexico is a federal state with a two-tier system of sub-national government comprising 31 states and one federal district (Mexico City) at the regional level and 2 412 municipalities at the local level. Jalisco contains 126 municipalities. Although Mexico is a federal country, its policy making remains quite centralised. Since the 1990s there has been a gradual devolution to the states and municipalities but sectoral policies are largely designed at the federal level, making co-ordination with lower levels of government a challenge. In the absence of effective co-ordination mechanisms, both between different levels of government and across sectors, policy making at the regional and local scale in Mexico is highly fragmented, making it hard to design strategies and policies tailored to local needs.

Economic assessment

The taxonomy classifies Jalisco as a region with catching-up potential, growing above the national average over the original period of 1995-2005. Looking at it over an extended period (1995-2007), the region recorded a slightly lower growth rate in GDP *per capita* during 2006 and 2007 than nationally. For the purpose of this case study, the region retains the original classification, despite the declining trend in recent years, as its growth rate was the same as the weighted national average over the period 1995-2007 and higher over the period 1995-2005. In 1995, GDP *per capita* was USD 6 604 expressed in PPP, around 4% below the national average and 65% below the OECD average. Over the period 1995-2007, GDP *per capita* grew at a rate of 2.01%, the same as the average pace of growth for Mexican regions, but below the national rate of growth of 2.08% and the average for OECD TL2 regions of 2.2%. Thus, over the first decade, Jalisco's rate of growth surpassed the weighted and unweighted national averages but slowed down in the two years following, so that the gap with respect to national and OECD levels remains barely changed at 5% and 66% below respectively. Population in the region increased by 1.18%, around the national rate of population growth and significantly above the rate of population growth in OECD TL2 regions of 0.6%. GDP overall grew at a rate of 3.2%, around the national rate and surpassing the OECD growth rate of 2.8%. Consequently Jalisco's lower growth in GDP *per capita* is mainly driven by higher population growth rates in the region; in absolute terms its economy has been quite dynamic.

Below we summarise how the region performed compared to national and OECD averages for five key indicators. Figure 3.16 summarises its performance against the national average.

- **Productivity remains an area of concern.** Productivity – measured by GDP per employee – stood at USD 18 503 in PPP dollars in 1996, 2% below the national average. From 1996-2007, productivity grew in the region at a rate of 0.62%, below

the average rate of growth of all Mexican regions of 1.38%, so by 2007 the region's productivity gap had widened to 10% below the rest of the country. This negative performance can be attributed mainly to activities with low productivity rates increasing faster than those with medium or high productivity rates.

- Growth in the region has mainly been driven by the commerce and service sector, which typically has a lower productivity rate than manufacturing. In 1993 the manufacturing sector contributed 21.5% of total value-added in the region but by 2005 this had fallen to 19.6%. Agriculture, forestry and fishing also fell from 7.9% to 5%. The structure of employment experienced even deeper changes. The total number of workers, i.e. those affiliated to the social security system (IMSS), increased by 20% between 1998 and 2008. At the same time the number employed in manufacturing increased by 4.3% while it rose by 46% in the service sector and almost 50% in the commercial sector. As a result the proportion of workers employed in services increased from 34% to 38% and in commerce from 16% to 19% while the proportion working in manufacturing fell from 32% to 26%. Within manufacturing, the performance was uneven. Traditionally strong sectors stagnated or decreased such as textiles and clothing, which between 1998 and 2008 fell by 4.7%; shoes and leather, which fell by 4.7%; and paper, printing and publishing, which fell by 6.8%, whereas others grew, such as the wood and furniture sector, by 5.44%, electronics and IT (3.9 %) and food processing, beverages and tobacco (2.5%).
- Jalisco's most dynamic sectors have seen significant productivity gains between 1998 and 2008 with productivity rises of 228% in the automobile and car-part sector,188% in tequila manufacturing, 118% in other food processing industries, 89% in furniture, and 85% in logistic services. The exception was the electronic, software and multimedia sector, which is experiencing an ongoing structural change, where productivity fell by 26%. The electronic industry in Jalisco started in the 1960s with the establishment of branches of some multinational enterprises for the domestic market. In the 1990s these had generated several spin-offs. After NAFTA, the sector experienced a new boom based mainly on investments by contract manufacturing enterprises (CM) in PC assembly operations. The industry had reorganised on a global scale, separating high value-added activities such as R&D, marketing and basic components manufacturing from low value-added activities such as assembly operations. The great majority of these assembly operations moved to China several years later giving rise to a new phase, restructuring the PC sector towards distribution and logistics activities and the assembly of PCs for the North American market in small batches or to order. Software and multimedia programming are increasing in parallel. This restructuring phase has pulled productivity in the electronic sector down but the new patterns of specialisation are more likely to remain viable in the face of global competition. Other successful clusters include food processing and furniture; the former almost tripling in value-added over 1998 and 2008 and exporting a number of its products, and the latter doubling in value-added and in number of enterprises.

- **Labour market outcomes in the region are adequate** and surpass national standards with lower rates of pre-crisis unemployment rates in 2007 (2.5% as opposed to the national rate of 3%) and higher rates of employment (66.1% as opposed to the national rate of 63.1%), about the same as the average employment rates in OECD TL2 regions. The participation of women in the labour market has gradually increased over the last decade but remains lower than for men. Most women are employed in the service sector (69.1%), followed by secondary activities (27.9%). Only 3.1% are employed in primary activities. Average wages among females remain 10% lower than for men. The Mexican institute for statistics and geography (INEGI) estimates that non-remunerated labour activities account for around 22% of national GDP. According to the 2000 census, there were 133 278 non-remunerated workers in the region, among whom 37% were women.
- **Human capital has improved**. Over the period 1995-2005 Jalisco reduced the proportion of low-skilled workers in its workforce by 5.3 percentage points, and increased the proportion of highly skilled ones by 3.72 pp. These gains resembled national changes (5.3 pp and 3.6 pp respectively). As a result, the region now has 17.5% of highly skilled workers in its labour force, higher than nationally and around the same share of low-skilled workers as other Mexican regions. In addition Jalisco also displays a higher quality of education than nationally with PISA scores both in mathematics and in reading above national standards (see Table 3.9) and significant gains in reading scores in recent years. These improvements can in part be attributed to the 29 higher education institutions, 56 technical education schools and 637 technical training centres in the region. The region has quite strong training provision and it is provided or financed by other state government agencies, mainly SEPROE (economic promotion) and FOJAL (SME financing). New programmes closely connected to specific sectors have been generated, such as two advanced programmes on ITC and semiconductor design, aiming to reaching 500 graduates annually each. Additional advances include the creation of a new private university specialising in multimedia, and a new multimedia capacity-building and training programme targeting young people.
- **Infrastructure surpasses national standards.** In 2005, motorway density – in relation to its population – was 3.61 in Jalisco, greater than the average value for Mexican regions of 3.22. In relation to the region's land area, motorway density was even higher, 317.1 as opposed to 175.14. In comparison to OECD standards, however, both indicators are significantly below the average. Guadalajara is a major node in Mexico's transport and logistics system, closely tied to its role as a commercial and service centre. The region is a hub for the wider area comprising the western, north-western and central-northern states of Michoacan, Colima, Nayarit, Sinaloa, Guanajuato and Aguascalientes. It forms a central node between the economies of the northwest and the central parts of the country and therefore has put efforts in improving the various modes of transport (air, sea, rail and road) to exploit this competitive advantage.
  - Guadalajara´s airport is the second largest air freight terminal after Mexico City, significantly surpassing Monterrey's. In 1994, over 70% of the country's air cargo went through Mexico City and 8% through Guadalajara, but by 2008 Guadalajara's share was more than 20%. Nowadays more focus is been placed on air freight services with the US, Asia and European countries. The airport has played a prominent role in the expansion of third-generation electronic operations in the region

since 2003 and, more recently in food industry exports. The airport administration seeks to position it as an air cargo hub for a large agriculture and livestock area around Michoacan, Colima, Nayarit, Sinaloa, Durango, Aguascalientes and Guanajuato.

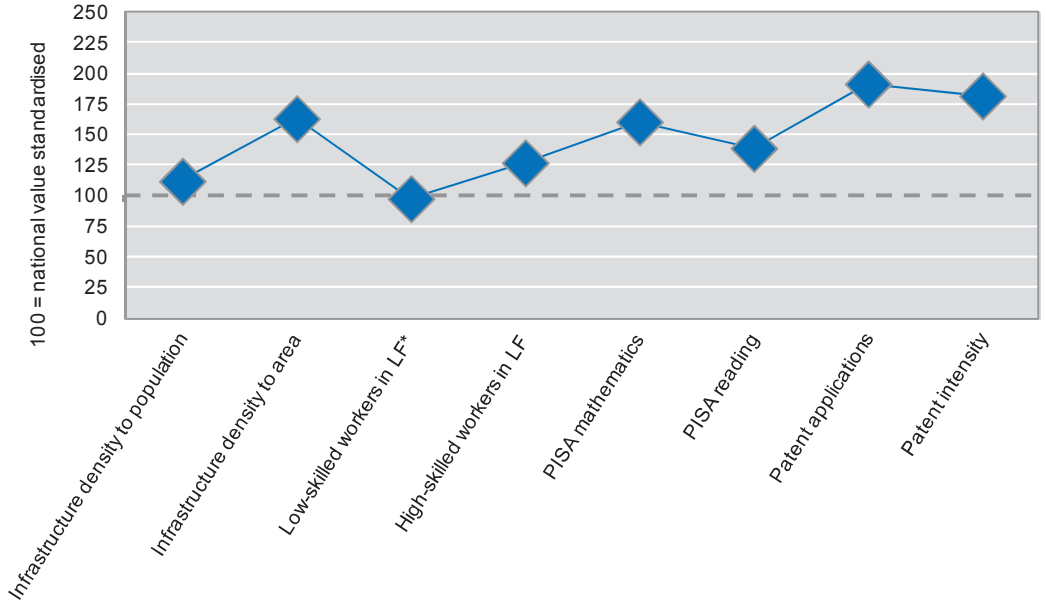
- Guadalajara also enjoys important sea freight connections. In the last decade, new and rapidly growing direct maritime services have been established connecting the Mexican ports of Manzanillo and Lazaro Cardenas with Asia, as an alternative to using the port of Long Beach for intermodal services between Asia and the eastern part of the US. The federal government has also carried out major investments in four-lane highways in its main national transport corridors since the 1990s. Guadalajara has benefited from these investments due to its central location in the national network. Meanwhile, the state government has focused mainly on improving internal connectivity, investing in intra-regional modes of transportation. The region also forms a node in two railway corridors connecting Mexico City with the port of Manzanillo and the north-western regions of the country and the US. Guadalajara is the major railway freight generator in the western and in the north-central part of the country, mainly driven by a number of large companies operating in food industries and construction. On the other hand it is a less important node in interregional and foreign trade movements behind San Luis Potosi and Queretaro.

- **Innovation activity is substantially higher than national standards.** The region has more overall patent applications, at 28.15, than the average for Mexican regions of 6.3, but is still below the OECD average of 430. In relation to its population, patent intensity is also significantly higher at 4.1, almost four times the national average of 1.6 but lower than the OECD average in TL2 regions of 85.6. Between 2001 and 2010, R&D expenditure increased by 822% and is by far the highest in the country. Most of it is financed by the private sector. A number of national higher education and research institutions have R&D branches in Guadalajara in fields related to the main regional clusters: including *i*) *Centro de Investigación y Estudios Avanzados del Instituto Politécnico Nacional* (CINVESTAV), specialised in electric engineering and with quite a few projects related to industry; *ii*) *Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco* (CIATEJ), a public research centre, affiliated to the CONACyT R&D network, oriented to the agricultural, food, health and environmental sectors, which has established recently a level 3 biosecurity lab, working currently in the isolation and diagnosis of the AH1N1 virus; *iii*) *Centro de Investigación Biomédica de Occidente* (CIBO), a branch of IMSS, the national social security agency; *iv*) *Centro de Investigaciones Pecuarias del Estado de Jalisco* (CIPEJ), a joint initiative taken by the federal and state governments and the Regional Livestock Association. Some companies also have their own R&D centres, mainly in the electronic sector, the most import being recently established by INTEL with 400 engineers active in developing new products, manufacturing technologies and new product architecture development. A further 127 R&D centres are active in the region.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a).

Figure 3.16 presents an integrated picture of several critical growth drivers identified in this section. This shows that Jalisco has an adequate level of infrastructure, good levels of human capital, especially highly skilled workers, and a superior level of innovation intensity. The region's main challenge is to further reduce its share of low-skilled workers.

Figure 3.16. **How drivers of growth compare to the national average, Jalisco, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced Jalisco's performance.

- **Adequate transport infrastructure capitalising on the region's privileged location**. The region's favourable location makes it an important logistics and transportation hub between the economies of the northwest and the central parts of the country. The region has undertaken important infrastructure improvements for air, sea, rail and road transport in recent years capitalising on the competitive offered by its location. Challenges still remain, however; for example, a second airport runway and two inland railway corridors are needed. Despite these gaps, infrastructure improvements have brought transport costs down, helping local firms become more competitive in internal and external markets and facilitating the movement of goods, services and people.

- **Enhanced dialogue and interactions among key stakeholders promoting endogenous growth.** The regional authorities have pursued initiatives promoting clusters in the region, especially those enhancing interactions between companies, government and educational centres including higher educational institutions and research institutes. These approaches were first put to work in a systematic and consistent way by the state government in co-ordination with local sector associations (CANIETI and CADELEC) for the electronic industry after its 2001-2003 crises.[17] Regional authorities have also put in place similar initiatives in other sectors including *i*) a fashion cluster establishing a fashion council and an innovation and design centre, seeking to set up an international fashion event in the region, *ii*) a furniture cluster related to interior design and decoration, grouping five industrial associations representing more than a thousand predominantly small enterprises in Guadalajara and the Cienaga region (Ocotlan), *iii*) a health-tourism cluster, oriented to the North American market, mainly war veterans, which groups the services of 12 certified hospitals and takes advantage of the attractive urban environment of Guadalajara and surrounding areas and *iv*) a bio-cluster, set up as a legal entity by the state government, universities and investigation centres, in concert with companies in the fields of human and veterinary pharmacy and food technology, whose mission is to act as an interface between entrepreneurial and academic / technological languages and to assist investors in search of initiatives or enterprises with a development potential in this area.

- **Urban development in the metropolitan area of Guadalajara** has been an important driver, partly due to co-operation between public officials from the eight municipalities that make up the larger metropolitan area. These efforts have enhanced the development of the larger area, building upon five decades' worth of cumulative experience in urban planning and management resulting in several reasonably successful formulas for designing social participation and financing. The metropolitan area has doubled in size in just three decades, from 1980 to 2010, and now hosts more than half of the region's overall population. The metropolitan area is also the main industrial hub for the wider region, hosting 41 of the region's 50 industrial parks.

- **Transforming its economy to higher value –added goods through human capital gains.** The region understood the importance of human capital from the outset, aiming to promote a technological centre in each of its ten smaller TL3 regions and establishing a number of higher education and research institutions with close links to the main clusters in the region including the *Centro de Investigación y Estudios Avanzados del* Instituto *Politécnico Nacional* (CINVESTAV), *Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco* (CIATEJ), *Centro de Investigación Biomédica de Occidente*, and *Centro de Investigaciones Pecuarias del Estado de Jalisco* (CIPEJ) among others. These centres have been critical in increasing the chain of value-added goods in the electronics and furniture sector and played a critical role in improving human capital indicators.

- **The brand name of Guadalajara and its high quality of life** has been a distinctive feature in the region enhancing tourism especially around its coastline surrounding the Puerto Vallarta area, and also attracting a high number of national residents to the region due to its high quality of life. The region has experienced a higher population growth than nationally, especially in the working age population. The improved brand name has helped efforts to promote exports such as the world

famous tequila, which has grown by 30% in recent years. Guadalajara is the main exporter of this product in Mexico.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.9).

- **A lack of entrepreneurial culture** especially in traditional sectors and among smaller firms. Successful cluster initiatives such as the electronic sector have been more difficult to replicate in other sectors in the region. Improving the entrepreneurial culture could enhance the generation, acquisition and transmission of knowledge in a region with relatively high innovation intensity.

- **Increased commuting and congestion costs.** The population in the metropolitan area has doubled in size at a time when its physical size more than trebled. This pattern of growth is already a serious obstacle for commuting trips in the area, which may require 45 minutes to an hour and a half within the metropolitan area and an hour to an hour and 50 minutes between peripheral municipalities. Due to these negative externalities, for the first time over recent years (2005-10) the metropolitan area has been growing at a slower rate than other areas within the wider region. Given that the large region is quite dependent on the performance of the Guadalajara metropolitan area, this slowdown can in part explain the slower overall growth rates in Jalisco in recent years. In order to tackle these problems, urban management institutions must be able to take effective control of certain elements which are currently out of reach, mainly land use, federal housing programmes and infrastructure and commercial projects in the metropolitan periphery.

- **Bridging gaps between human capital supply and demands**. Guadalajara's robust and diverse academic institutions have contributed to important gains in human capital in recent years. Nevertheless, as a result of restructuring, particularly in the electronic sector, their output in some cases has lagged behind the labour market requirements.

- **Lack of effective territorial co-ordination** driven by a high degree of fragmentation of national policies and lack of leadership. The region suffers from structural rigidities in the planning and management of public policies and programmes at the national level, which are divided along sectoral lines, and lack of effective territorial co-ordination. As a result, investment planning and project formulation are not clearly articulated, a problem which is magnified by the growing role of private investment agents, in the absence of any clear leadership from public agencies.

Table 3.9. **Statistical summary, Jalisco**

	Period	Jalisco	Mexico	OECD	National gap	OECD gap
Levels						
GDP pc	1995	6 604	6 879	18 926	96%	35%
	2007	8 383	8 808	24 597	95%	34%
GDP	2007	57 867	630 945			
GDP share	1995	6.21%	n.a.			
Productivity	1996	18 503	18 837	44 513	98%	42%
	2007	19 803	21 891	54 713	90%	36%
Area (in km^2)		78 630	1 959 244			
Area share of national		4.01%				
Population	2008	6 960 799	106 682 518	3 481 456		
Population share	2008	6.52%	n.a.	n.a.		
Population density	2008	89	54	263		
Elderly dependency ratio	2008	9%	9%	21%		
Youth dependency ratio	2008	45%	46%	28%		
Motorway* density (p)	2007	3.61	3.22	n.a.		
Motorway* density (a)	2007	317.11	175.14	n.a.		
Primary attainment % LF	2005	67.1%	66.9%	27.4%		
Tertiary attainment % LF	2005	17.5%	16.4%	26.0%		
PISA mathematics	2009	436	419	500		
PISA reading	2009	438	425	500		
Unemployment rate	2007	2.5	3.0	6.3	-0.47	-3.8
Employment rate	2007	66.1	63.1	66.7	2.95	-0.6
Patent applications	2006	28.15	6.2	430.0		
Patents per million	2006	4.1	1.6	85.6		
Changes						
GDP pc growth	1995-2007	2.01%	2.08%	2.2%		
GDP growth	1995-2007	3.2%	3.3%	2.8%		
Productivity growth	1996-2007	0.62%	1.38%	1.83%		
Population growth	1995-2008	1.18%	1.17%	0.6%		
WA population growth	1995-2005	1.96%	1.89%	0.8%		
Elderly dependency (pp change)	1995-2008	0.59	0.01	2.50		
Youth dependency (pp change)	1995-2008	-16.89	-0.17	-6.28		
Primary education (pp change)	1995-2005	-5.30	-5.27	-6.09		
Tertiary education (pp change)	1995-2005	3.72	3.59	5.84		
PISA Mathematics (pp change)	2003-2009	16.00	33.52			
PISA Reading (pp change)	2003-2009	4.00	25.19			
Employment rate (pp change)	1996-2007	0.91	1.81	1.87		
Unemployment rate (pp change)	1998-2007	0.38	1.06	-1.82		
Patents per million (pp change)	1995-2006	3.81	0.83	53.29		

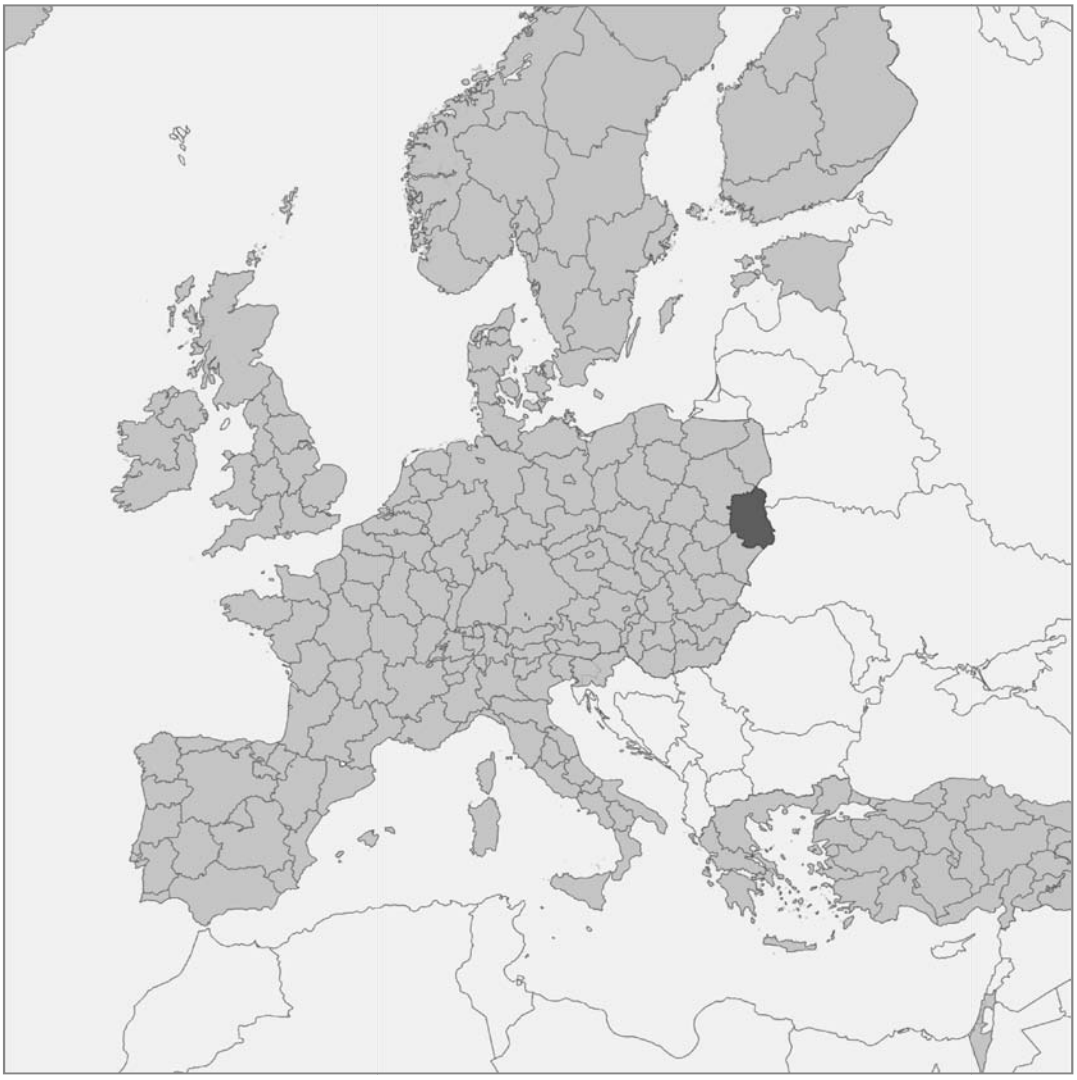
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age, p = population; a = area. * Motorway data for Mexico includes motorways and secondary roads.

Source: OECD Regional Database (2011).

Lubelskie, Poland

Figure 3.17. **Lubelskie, Poland**

Regional category: Catching-up potential and growing below the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Lubelskie encompass four smaller TL3 sub-regions: Bialski, Chelmsko-Zamojski, Lubelski and Pulawski.

The region was home to 2.2 million people in 2008, or 5.7% of the Polish population. Its population density, at 89 people per km^2 is lower than the Polish

average of 122. Around 12.9% of the region's area is protected under NATURA 2000. The largest city is Lublin, with 354 272 inhabitants, followed by Chelm (67 989) and Zamosc (66 989). Although the region appears to be dominated by Lublin, the city only hosts 16% of the region's population. Geographically, the region is quite peripheral to its core European and Polish markets. Lubelskie is located in the east of Poland with Ukraine to its east and to a lesser extent Belarus to its northeast. Within Poland its neighbours are Podkarpackie to the south, Swietokrzyskie to the southwest, Mazowieckie to the west and northwest and Podlaskie to the north. All of these neighbouring regions except Mazowieckie have lower levels of GDP *per capita* than the national average. More than half of the population, 57%, live in rural communities, well above the Polish average of 45%.

The Lubelskie voivodship experienced two major shocks to its economy in the past two decades. First, the transition from a closed communist economy to a fully open market economy combined with the closing of the eastern border in 1999 caused a collapse in the region's production structure due to the closing down of large state-owned enterprises. Then, Poland's accession to the EU in 2004 left the region on the periphery of core European markets while further shutting down the region's commercial ties to eastern non-EU member neighbours. Membership of the EU also brought important institutional reforms with it.

Poland is a unitary state with three tiers of sub-national government. The top tier consists of 16 regions (*województwa*), the second 379 counties (*powiaty*) and the third 2 478 municipalities (*gminy*). In 2006, 30.7% of all spending was devolved, while the regions and below accounted for 18.9% of total revenue. Poland has gradually decentralised since 1990. A series of administrative reforms since 1999 have resulted in the assignment of a number of specific responsibilities to regional authorities.

Central government is represented in the region by *wojewoda,* while the regional government is headed by a *marszalek*, who is responsible for planning and managing the region’s development together with the regional assembly, or *sejmik wojewodzki.* The regional government’s key tasks and responsibilities consist of: *i*) formulating a strategic vision of regional development and developing plans based upon it, and *ii*) creating active policies of regional development. The regional government often has to co-operate with other government bodies as well as with other institutions and organisations. It should undertake initiatives to stimulate economic development, improve the competitiveness and innovativeness of the regional economy, maintain its cultural and natural assets, maintain spatial order and harmony, maintain and plan expansion of social and technical infrastructure at the regional level, and provide regional public services. To these ends it formulates policies covering social development (human and social capital), development of social and technical infrastructure, financial measures needed to carry out specific tasks, use of natural resources in accordance with the principles of sustainable development, facilitation of collaboration between research institutions and businesses to promote technological progress and innovation, development of culture and the protection and rational use of cultural heritage.

The regional government is responsible for science and education (some post-secondary and secondary education, teachers, training centres, regional libraries); regional roads and public transport (road network development planning, acting as an investor and maintaining roads and traffic engineering devices); health care (specialised facilities, some health spas); social assistance (development and implementation of social assistance programs, vocational training of social assistance institutions staff); culture and national heritage protection (supporting cultural institute), environmental protection and water management (including flood protection; setting fees for waste disposal) and recreational and physical education. It is also responsible for land-use planning through regional planning offices responsible for formulating and implementing the region's spatial policy. Spatial development policy goals include rational zoning, improving those areas where development problems are concentrated, and modernising rural areas.

Economic assessment

The taxonomy classifies Lubelskie as a region with catching-up potential and growing below the national average. In 1995 GDP *per capita* was USD 6 297 (adjusted for PPP), approximately 22% below the Polish average and around 67% below the OECD average for TL2 regions. Over the period 1995-2007, its GDP *per capita* grew by 3.47%, significantly below the national rate of growth of 4.72% and significantly above the OECD TL2 regions growth rate of 2.2%. Consequently the GDP gap nationally increased to 32% below the national average in 2008 while the gap with respect to the OECD closed to just 61% below the average. Population in the region declined by 0.27%, from 2.24 million in 1995 to 2.17 million in 2008, more rapidly than the decline in Poland as a whole (0.10%), at a time when the OECD population increased by 0.5 percentage points. GDP growth overall was 3.2%, below the national growth rate of 4.6% but well over the average pace of growth in OECD TL2 regions at 2.8%. This means that part of the convergence with OECD GDP *per capita* is driven by population decline.

Below we summarise how Lubelskie performs compared to national and OECD averages for five key indicators. Figure 3.18 summarises this performance against the national average.

- **Productivity is falling further behind national levels** but catching up with the OECD. Productivity – measured by GDP per employee – stood at USD 16 439 in PPP in 1995, 16% below the national average, and significantly below the average productivity in OECD regions of 44 513 per employee. During an eight year period, productivity in the region grew by 2.85%, almost four percentage points below the average productivity growth in Poland (6.63%) but above the OECD TL2 regions average of 1.83%. Consequently its productivity gap with respect to the rest of the country widened significantly to 40% but it closed its productivity gap with the OECD to 61% from 63%. As in other Polish regions, productivity gains in Lubelskie have been partly driven by a contraction of the workforce. The region experienced 1 100 net job losses during 1999-2007. This suggests the region is still undergoing a profound structural change.

- Lubelskie is still highly dependent on agriculture, which employs 25% of the workforce but only provides 7% of GDP. The region has a large number of small farms with few economies of scale and low technological intensity. Of its 300 000 farms, 90 000 are 1-20 hectares, 5 000 are 20-50 hectares and only 600-700 of them are larger than 50 hectares. The average size of a farm in the region has increased slightly to 7.4 hectares in 2010, up from 6.7 ha. The productivity of small farms is very low and their input into market of agricultural products is minimal, with a large share of them having no economic activity at all, basically subsistence agriculture. Most of the region's farmers have no agricultural education (150 000 compared to 117 000). The manufacturing sector employs 17.8% of the workforce, compared to the national rate of 29.6%.Services employ 39% of the workforce, against an average of 50.5%.The region is also relatively specialised in low-tech manufacturing in plastics and woods, construction and the public sector is a significant employer in the region.

- The most important sectors for GVA are trade services, industry including food processing and machinery production, real estate, and business services, and science and agriculture. The greatest growth was associated with industry, real estate services, and business services and science. The increase in competitiveness in industry was driven by the increased importance of the knowledge-dependent medium- and high-tech sector, and the modernisation of the food processing sector. Real estate services, business services and science also made competitive gains, in contrast to trade and agriculture. Trade competitiveness was influenced by a substantial fall in trading activity with the closure of the eastern border. Within agriculture, the problem was the slow pace of restructuring of smaller farms, preventing technological progress, and low levels of self-organisation among food producer groups. Important cluster initiatives and start-ups in the Lublin Voivodeship include the knowledge cluster, the Lublin region culture cluster, the ecological food valley, cauliflower and broccoli festival, the cluster of restaurant owners, food cluster, the tourism/agrotourism cluster, the Lublin lumber association, the IT cluster PKI, the Podkarpacko-Lubelski innovative information technology cluster, the polish medicine cluster, the machinery cluster and the aviation industry component producers cluster.

- **Labour market outcomes are mixed** with pre-crisis rates of unemployment at 8.8%, higher than the Polish average of 7.3% and the OECD TL2 average of 6.3%. Youth unemployment was at 24.6% well above the Polish average of 17.7% and the OECD average of 15.3%. In contrast, employment rates of 65.3% and participation rates of 71.6% are higher in Lubelskie than the Polish average (56.6% and 62.2% respectively) and in line with the average in OECD TL2 regions (66.7% and 70.5%). The unemployment rate in the region decreased 2.1 percentage points, less than the Polish average of 5.7% but employment rates have risen more – 1.7 percentage points against one percentage point nationally.

- **Human capital in the region improved significantly**. The share of high-skilled workers in the region's workforce – measured by the proportion with tertiary qualifications – increased by 9.8 percentage points over the period 1999-2008, at a time when it remained stable nationally, and only increased by 5.8 pp in the OECD regions. The share of low-skilled workers fell by 10.5pp, when again it remained stable nationally and fell only by 6.3pp in the OECD. Due to these gains, the region's workforce is now approaching national levels with a 23% of workers classed as highly skilled, similar to the Polish average, and only three percentage points lower than the OECD one. The share of low-skilled workers, 11.4% remains a bit higher than the national share of 9.3% although this proportion is lower than the OECD TL2 region average of 27.4%. These recent gains have been partly due to a number of higher education institutions located mainly in the capital city Lublin, including five public universities (University of Maria Curie - Sklodowska University, Catholic University of Lublin John Paul II, Technical University of Lublin, Medical University and the University of Life Sciences), the European College of Polish and the Ukrainian Universities, and many private schools. The region suffers from brain-drain effects as a large share of graduating students leave the region in search of employment opportunities elsewhere.

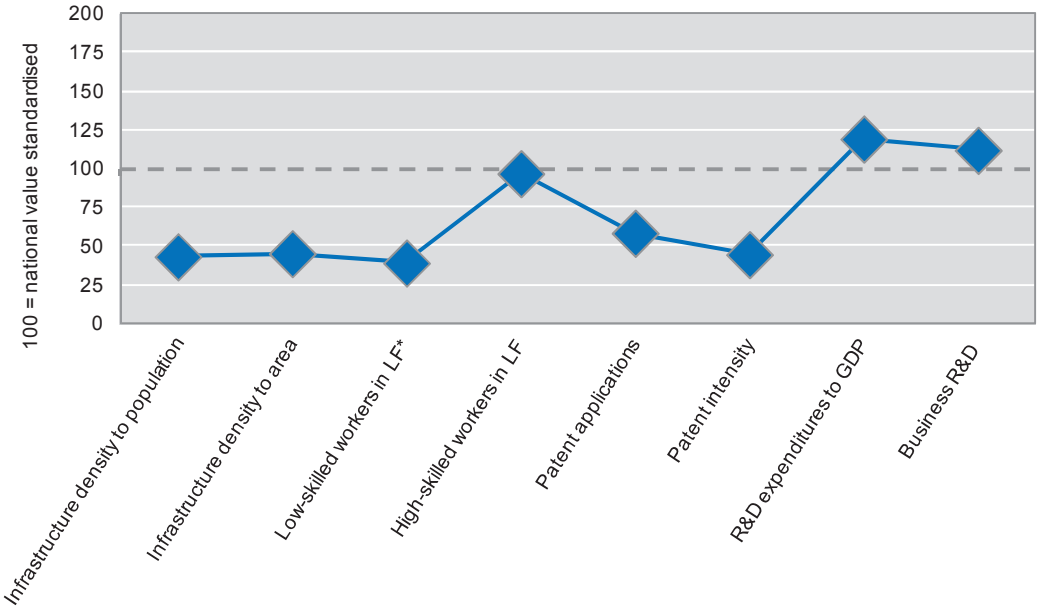
- **Infrastructure is inadequate** and significantly below national and OECD standards. In 2008, the region had no motorways, defined as two-lane highways. The region's total transport network is comprised of six roads and four railways. It will be complemented with two domestic airports in Świdnik and Biala Podlaska but these won't be completed until after 2012. There are no ring roads; and the existing railways and local roads are relatively inefficient. These infrastructure gaps discourage capital inflows to the region, make it hard to access external markets and reduce internal mobility within the region. Some areas lack basic sewage and water pipelines and the area's ICT infrastructure is also poorly developed although these shortages are being currently addressed through the Regional Operational Programme and centrally managed programmes co-financed by the EU.

- **Innovation activity is quite low.** Only 2 patent applications were recorded in 2007, compared to an average of 6.7 for Poland as a whole 430 for all OECD regions. Patent intensity is also lower at 0.9 than on the national average of 2.3 and significantly below the OECD average of 85.6. Expenditures on R&D were 0.48% of GDP, higher than the national average of 0.40%, and around one-third of OECD TL2 levels (1.55%). Business R&D expenditures, at 0.15% of GDP, is slightly higher than on the Polish average of 0.13%, and one-sixth of typical levels in OECD TL2 regions (0.93%) whereas public R&D expenditures was around the Polish average at 0.15% of GDP, lower than in OECD regions (0.25%). Among the reasons for the low patent intensity despite higher research spending are the region's cultural attitude toward innovation and risk aversion, an inadequate network to support entrepreneurship and difficulties in financing early start-ups. There is one important technological park is Swidnik, home to 43 companies employing 800 people in the areas of automotive and aviation.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.18 presents an integrated picture of several critical growth drivers identified

in this section. This shows that the region is especially lacking in infrastructure and innovative activities despite higher R&D spending levels. Its human capital indicators are in line with the national standards, although the region has a higher share of low-skilled workers.

Figure 3.18. **How drivers of growth compare to the national average, Lubelskie, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors which have influenced the performance of the region:

- **Internal demand for goods and services.** Lubelskie is traditionally an agricultural region with Lublin, its capital city, offering specialised services, including education, to the region's population and businesses. Internal demand is generated from, among others, an increasing number of small firms in the construction market. Dynamic growth in the amount of value-added in the construction and real estate services sector suggests that the main driver of GDP growth has been investment, and to a smaller extent consumption.
- **Proximity to the eastern border.** The closure of the eastern border after EU accession in 2004 had an adverse effect on the region's economic performance. However, various links and relationships remain and have been strengthened. Activating border trade and improving co-operation with the neighbouring countries of Belarus and Lithuania could boost commercial activity in the region.
- **Adequate levels of human capital in higher education.** The number of well-educated inhabitants exceeds the capacity of the labour market, not just because of its size but because of its characteristics. Thus, in this context the term *adequate* might be

misleading: it is much more than the market can absorb. The city of Lublin is home to many well-known universities attracting students from the region, the country, and from abroad. A significant number of students depart the region in search of employment opportunities elsewhere. Retaining them by enhancing co-operation between the business community and higher education institutions could turn them into an asset for the region, although the universities and the private sector in Lubelski have had difficulties in co-operating in the past. The teaching institutions would have to be more flexible about adjusting the courses they offer to meet regional demand. Institutional arrangements based on the triple-helix type[18] of co-operative arrangements could help.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire and the results of our own analysis (summarised in Table 3.10).

- **Inadequate spatial and functional integration.** Lubelskie has suffered for decades from its peripheral location. A period of intensive industrialisation in Poland under communist regime brought to the region a number of industrial activities such as automobile manufacture and coal mining but these investments did not change the overall economic profile of the region. The collapse of the old regime resulted in the decline of the industrial sector in the region as most of the big factories were state owned. The region is not just geographically peripheral but also in terms of its position within economic networks. Relative backwardness has become a stigma, which has negative impact on the image of the region.
- **Inadequate infrastructure, especially for transportation**. Poor transportation links contribute to the fragmentation of the region. Lubelskie is hardly accessible from the outside; internal accessibility is little better. This has a strong impact on decisions over where to locate functions and activities, reinforcing the polarisation of development within the region and hence social and economic disparities. The region experiences different drivers, paths, and outcomes for urban and rural development. There is very little evidence that urban and rural assets are being used according to a long-term economic development plan. This lack of integration has many reasons. It seems that development policies from the last 20 years have served to fossilise the existing social, economic, and spatial structures.
- **Unfavourable geographic location**. As with Podlaskie, the region's location is a bottleneck to growth in many ways, particularly its peripheral location. The region is surrounded by other lagging regions (or lagging parts of other regions, in the case of the Mazowieckie region). This creates additional barriers to development and makes it harder to establish functional relationships that could change the development path of the region.
- **Failure to restructure its agricultural sector** has been an important deterrent to progress in the region. The agricultural sector needs to move towards activities with greater value-added. The region’s small farms and low levels of education among farmers lead to relatively low levels of efficiency. The sector needs to modernise, gain economies of scale and promote competition. Current EU subsidies to farming do not provide any incentive to undergo this restructuring. Farmers need to improve and differentiate their products and organise into groups to improve the quality of their products and their marketing.

Table 3.10. **Statistical summary, Lubelskie**

	Period	Lubelskie	Poland	OECD	National gap	OECD gap
Levels						
GDP pc	1995	6 297	8 048	18 926	78%	33%
	2007	9 485	14 004	24 597	68%	39%
GDP	2007	20 578	310 628			
GDP share	1995	3.85%	n.a.			
Productivity	1998	16 439	19 660	44 513	84%	37%
	2007	21 178	35 027	54 713	60%	39%
Area (in km^2)		25 121	312 685			
Area share of national		8.03%				
Population	2008	2 166 213	38 115 641	3 481 456		
Population share	2008	5.68%	n.a.	n.a.		
Population density	2008	89	122	263		
Elderly dependency ratio	2008	21%	19%	21%		
Youth dependency ratio	2008	23%	22%	28%		
Motorway density (p)	2008	0.00	0.02	0.20		
Motorway density (a)	2008	0.00	2.45	21.91		
Primary attainment % LF	2008	11.4%	9.3%	27.4%		
Tertiary attainment % LF	2008	22.8%	22.9%	26.0%		
Unemployment rate	2008	8.8	7.3	6.3	1.50	2.5
Employment rate	2008	65.3	57.7	66.7	7.60	-1.4
Long-term unemployment	2008	2.79	2.5	2.4	0.30	0.4
Youth unemployment	2008	24.59	17.7	15.3	6.92	9.2
Patent applications	2007	2.00	6.7	430.0		
Patents per million	2007	0.9	2.3	85.6		
R&D to GDP	2005	0.48%	0.40%	1.55%		
BERD to GDP	2005	0.15%	0.13%	0.93%		
GERD to GDP	2005	0.15%	0.15%	0.25%		
Changes						
GDP pc growth	1995-2007	3.47%	4.72%	2.2%		
GDP growth	1995-2007	3.18%	4.62%	2.8%		
Productivity growth	1998-2007	2.85%	6.63%	1.83%		
Population growth	1995-2008	-0.27%	-0.10%	0.6%		
WA population growth	1995-2008	0.44%	0.48%	0.8%		
Elderly dependency (pp change)	1995-2008	0.81	0.02	2.50		
Youth dependency (pp change)	1995-2008	-14.75	-0.14	-6.28		
Primary education (pp change)	1999-2008	-10.51	-7.51	-6.09		
Tertiary education (pp change)	1999-2008	9.85	10.15	5.84		
Employment rate (pp change)	1999-2008	1.72	1.04	1.87		
Unemployment rate (pp change)	1999-2008	-2.15	-5.71	-1.82		
Patents per million (pp change)	1996-2007	0.70	1.61	53.29		
R&D to GDP (pp change)	2000-2005	-0.02	-0.05	0.13		

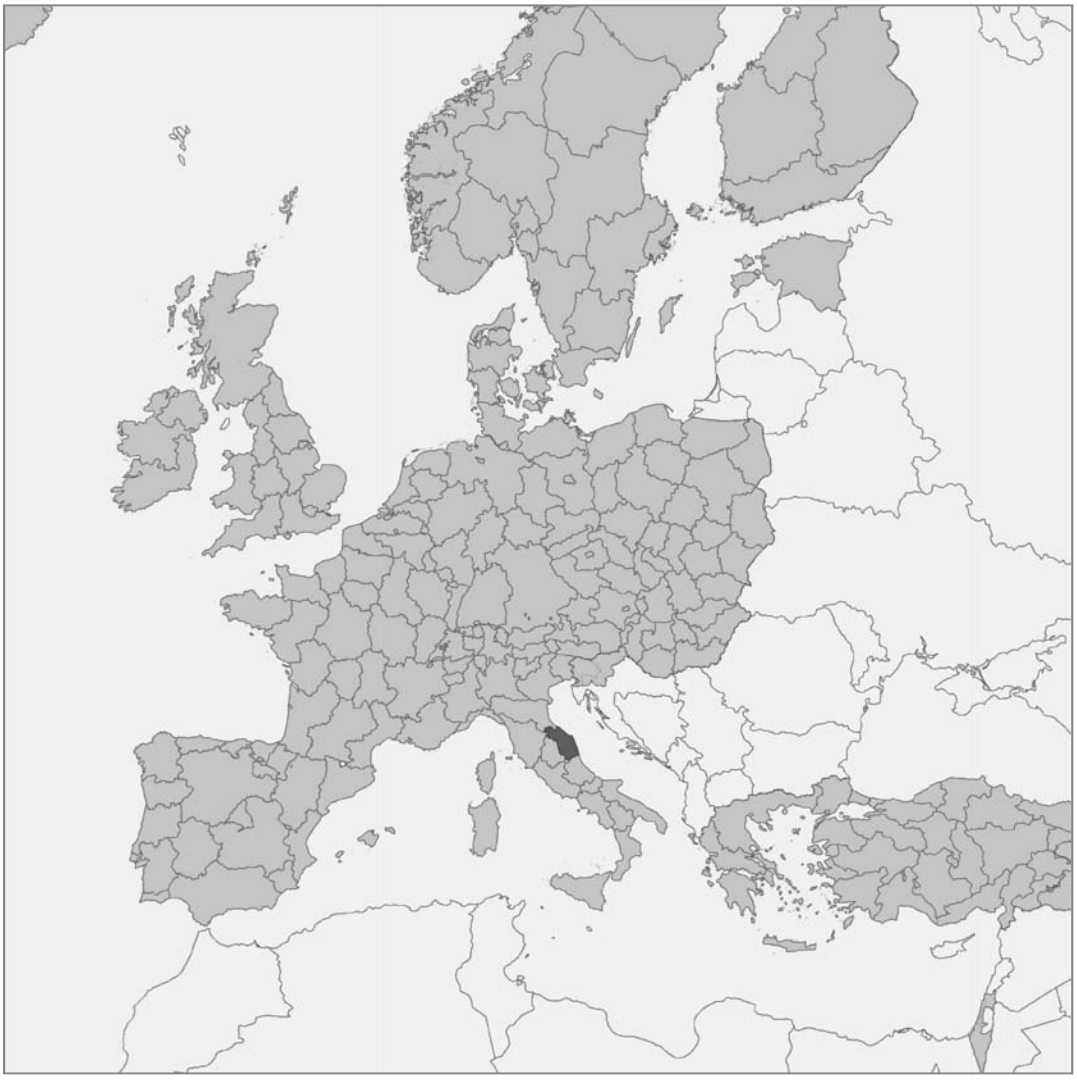
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Marche, Italy

Figure 3.19. **Marche, Italy**

Regional category: Catching-up potential and growing above the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Marche encompasses four smaller TL3 regions, Pesaro e Urbino, Ancona, Macerata and Ascoli Piceno. Its population in 2008 was 1.55 million, or 2.6% of the Italian population. Its population density at 148 people per km^2 is lower than the Italian average of 198 and significantly lower than the OECD figure of 263. Although the region is centrally located within Italy, it is relatively remote from core European and northern Italian markets. To its east is the Adriatic Sea and neighbouring regions

include Abruzzo to the south, Umbria to the west, a small portion of Toscana to the northwest and Emilia Romagna to the north and the northwest. The largest cities in the region are Ancona, with 101 909 inhabitants, Pesaro (92 206), Ascoli Piceno (51 400), Macerata (43 000) and Fermo (37 804). Its settlement patterns are quite polycentric without any particular city dominating and a number of medium-size cities scattered around the region. The percentage of the population living in rural communities is 29%, lower than the average of 33% for other Italian regions and much lower than the figure for the OECD TL2 regions (45%).

Marche has experienced two significant economic shocks during the past decades. The first came with Italy's increased integration into European markets when it joined the European Monetary Union (EMU) in 1998, opening new international markets and opportunities to SMEs in the region. Traditionally firms and enterprises were mainly subcontractors of medium or large national companies with few external links. The opening of European markets helped local enterprises make new contacts with clients in these new European markets, especially in Germany. The second shock came with the opening of southeast European markets providing even more international links to firms within the region. The collapse of the Soviet Union and the end of the Balkan war also brought further opportunities to establish productive networks in these new markets. As a result industrial districts in the region have become more internationally focused.

Italy is a unitary state with a three-tier system of sub-national government. The top tier consists of 20 regions (*regioni*). The second tier comprises 103 provinces (*province*) and the third tier 8 101 municipalities (*comuni*). In 2006 31.5% of all spending occurred at the sub-national level while regions and below accounted for 20.3% of total revenue.

In terms of legislative functions, the constitution states that ordinary regions hold exclusive competences for local development (industry, commerce, handicrafts and tourism), agriculture, mining, water resources, hunting, housing and city planning, regional networks of transport, public transport, regional administration, regional public order and safety, vocational training, and social services. In other fields, the regions share competences with the state, which establishes the general principles enabling the regions to develop detailed legislations including international and EU relations, foreign trade, safety and work security, R&D, health care protection, civil protection, territorial planning, civil ports and airports, large transport networks, harmonisation of public accounts and co-ordination of public finances and the taxation system, energy, education, supplementary social security, local credit institution, and the enhancement of cultural and environmental assets.

Economic assessment

The initial taxonomy elaborated over (1995-2005), classified Marche as a region with catching-up potential, growing below the national average. When applying the taxonomy over an extended period (1995-2007) with revised data it could be categorised as a region with catching-up potential and growing above the national average. For the purpose of this case study we adopt the latter classification, given the region's higher overall GDP and productivity growth rate than nationally during this period. According to the data, in 1995 GDP *per capita* was USD 20 627 in PPP dollars, just 3% below the Italian average and 9% above the OECD average in TL2

regions. Over the period 1995-2007, GDP *per capita* grew at a rate of 2.29%, above the national rate of 1.89% and almost exactly the OECD rate of 2.2%. Consequently the region not only closed the gap in GDP *per capita* with the country but surpassed it, standing 2% above it in 2007. With respect to OECD levels the region further increased its lead by one percentage point to 10% above. Population in the region increased by 0.6%, almost twice the Italian growth rate (0.37%) and around the average pace of growth in OECD TL2 regions. GDP overall grew at a rate of 2.9%, also exceeding the national rate of 2.3% and the OECD rate of 2.8%.

Below we summarise how Marche performed compared to national and OECD averages for five key indicators. Figure 3.20 summarises its performance against the national average.

- **Productivity is catching up.** Productivity – measured by GDP per employee – in 1995 stood at USD 49 158 expressed in PPP, 10% below the national average and 10% above the OECD average. From 1995 to 2007, productivity grew at a rate of 2.22%, surpassing the Italian average productivity growth of 1.79%, and the OECD rate of 1.83%. Consequently the region has reduced its productivity gap with the rest of Italy to standing 6% below the average by 2008 and increase to 17% above the OECD level by 2007.

  - The largest sector in the region is services, employing 65% of the workforce followed by manufacturing (32%) and agriculture (3%). The service sector has been increasing between 2000 and 2008 gaining three percentage points (from 62%), manufacturing has lost two (from 32%) and agriculture one pp (from 3%). Agricultural activity has transformed in the last 30 years, shrinking in relation to the rest of the economy but becoming more modern and productive with the sector generating slightly above the national average gross value in the region. The main products are cereals, vegetables, animal products and grapes. In spite of the marine impoverishment, the sea has always furnished a plentiful supply of fish, the main fishing centres being Ancona, San Benedetto del Tronto, Fano and Civitanova Marche.

  - Despite its relative decline, manufacturing is the backbone of the regional economy. The region is dominated by small and very small enterprises clustered in different areas of the region, giving its name to a classic example of manufacturing district that became a model of industrial development (the MARCHE model), a backbone of the Italian industrial system and economy. The number of manufacturing businesses is relatively large, encompassing approximately 160 000 enterprises. Many small craft workshops scattered through rural settlements have modernised and turned into small competitive businesses, some of which have become competitive internationally (Indesit, Tod's, Guzzini and Teuco). The four most important sectors in the region are ship building, domestic appliances, shoes and textiles, and furniture. Ship building has lost market share due to competition from China and Korea, while domestic appliance manufacturing suffered from the fall of the biggest producer (Merloni) but still remain competitive within international markets. The shoe and textiles sector suffered a significant crisis which forced surviving businesses to

upgrade but furniture manufacturing has increased its competitiveness and found new markets in Middle East and Russia. Industrial production is characterised by mature products and the region is a prominent exporter that outperforms the country as a whole, accounting for approximately 25% of the regional GDP. The region draws increasing numbers of tourists, attracted by the rich and broadly distributed heritage of history and monuments, as well as by the traditional seaside resorts.

- **Labour market outcomes are adequate** with lower pre-crisis rates of unemployment at 4.7% than the national level of 6.9% and the OECD average of 6.3%. Rates of long-term unemployed were also significantly lower (1.61% as opposed to 3.2% nationally and 2.4% for the OECD regions) as were the youth unemployment rates (12.5% as opposed to 20.9% and 15.3%). Employment rates, at 65.8%, surpassed the average in Italian regions of 60.4% and have risen by five percentage points over the period 1999-2008 to close the OECD average of 66.7%. A challenge for the region remains its low female employment rates.

- **Despite recent improvements, human capital remains below national standards.** Over the period of 1999-2008 Marche reduced the proportion of low-skilled workers by 11.46 pp (Table 3.11) – measured by the share of the region's labour force with only primary qualification – and increased the proportion of highly skilled workers by 2.42 percentage points. These gains exceed the national gains in reducing low-skilled workers (9.62) but were lower than the national gains in improving high-skilled workers (5.91), leaving the region with a slightly lower proportion of low-skilled workers (37.6% as opposed to 38.6%) but also a slightly lower proportion of the highly skilled ones (16.2% as opposed to 17%). Compared to OECD standards, however, there is still plenty of room for improvement. The region's policies for improving its human capital concentrate on lifelong learning. In the period between 1999 and 2006 the Marche region has financed more than 3 000 training projects which have involved about 42 000 people.

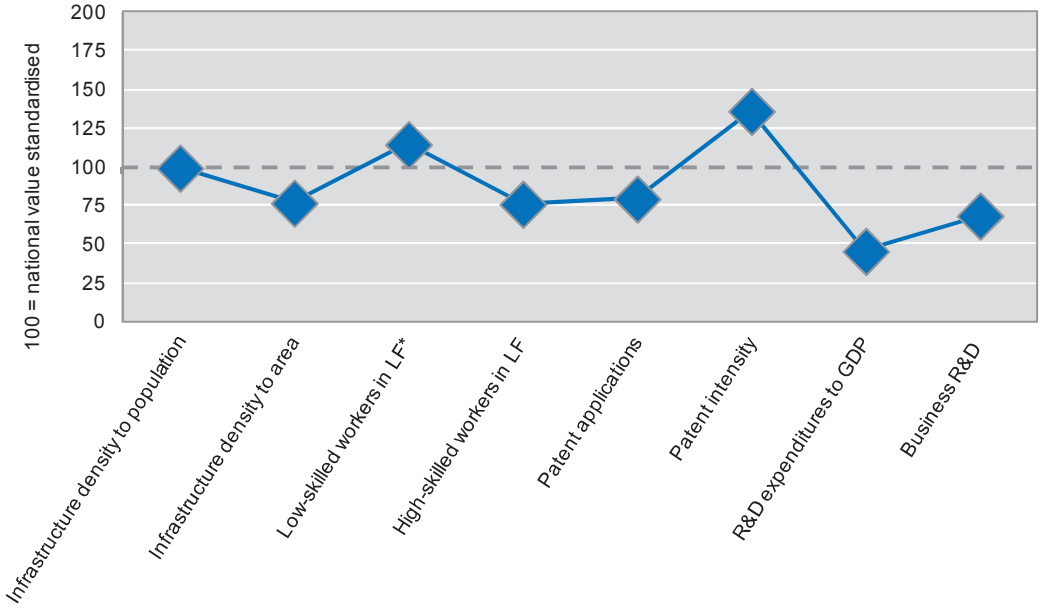
- **Infrastructure is slightly lower than national standards** and below OECD levels**.** Motorway density – with respect to its population – is the same as the average value for Italian regions at 0.11 and around half the average value in OECD TL2 regions of 0.20. Motorway density with respect to land area, at 17.33, was slightly lower than the Italian average of 21.86 and the OECD average of 21.91. More worrying is the lack of accessibility to EU markets and to technological poles of Torino, Roma and Milano despite its central location in Italy. Accessibility to potential markets,[19] measured by road and rail travel times is 59% and 56% of the EU average accessibility figure respectively. The only airport in the region is in Ancona, and the region faces significant challenges with broadband/ICT expansion, with a relatively low take up of broadband particularly in the business sector.

- **Innovation activity has been increasing in recent years**. On the one hand the region has fewer overall patent applications (95.90) than the Italian average (153.5) or the OECD average (430). On the other hand, in relation to its population, patent intensity, at 62.1 surpasses the national average of 46.1 although it remains below the OECD level of 85.6. R&D expenditures as a proportion of GDP, at 0.57%, are lower than the national figure of 0.89% and around one-third of the OECD average of 1.55%. The share of business R&D expenditure, at 0.25% of GDP, is lower than

the average Italian private sector share of 0.38% and around a quarter of the share in OECD TL2 regions (0.93%). The public sector expenditure of 0.04% of GDP is a quarter of the Italian average of 0.16% and less than one-sixth of what the public sector typically invests in OECD regions (0.25%). Although innovation activity remains behind the Italian and OECD averages, the region has increased patent intensity by 51.3 percentage points in recent years, against the national increase of 35.6, while R&D expenditures increased 0.11 percentage points as a proportion of GDP against a national increase of 0.07. Part of this rise is due to the region's efforts in supporting knowledge-based activities in recent years, aimed at building greater linkages between the region's universities and training institutions and the private sector, for instance the creation of technology transfer centres for some sectors. Despite these developments, challenges still remain in improving innovation in traditional sectors, such as shoes, ship building, textiles and furniture making, all of which have low levels of innovation and are vulnerable to competition from emerging countries.

Ensuring key drivers of growth are **integrated and complement each other** in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.20 presents an integrated picture of several critical growth drivers identified in this section. This shows that Marche has gaps in infrastructure, highly skilled workers and in R&D expenditures. The region's strength is its higher innovation output in relation to lower research and development inputs.

Figure 3.20. **How drivers of growth compare to the national average, Marche, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of the region.

- **Strong entrepreneurial tradition**. The region's cultural background is very favourable to the spirit of the "self-made man" and traditionally entrepreneurs are recognised as pillars of the community. Setting up businesses, working hard, taking market risks and going abroad to exploit foreign market opportunity are in the genes of the inhabitants and the history of the region. This entrepreneurial spirit and the region's many SMEs are important factors promoting its competitiveness and continuing to exploit market opportunities – as reflected by the region's strong export performance and good innovation outputs in relation to lower innovation inputs.

- **Strong manufacturing tradition.** Since the 1960s Marche has been an industrial region with well-established mature clusters in shoes, ship building, textiles, furniture and domestic appliances. Manufacturing employs 33% of the region's workforce and the region is home to 17% of Italy's industrial districts, despite producing only 2.6% of the country's GDP. Some of the firms within the region's traditional sectors have become internationally competitive, among others Indesit, Tod's and Guzzini. There is a strong tradition of collaboration between firms in production. The manufacturing tradition has been responsible for lifting the region's productivity and overall growth performance during the past decades.

- **Turnaround of traditional sectors through innovation-intensive initiatives.** Despite the lack of big institutional buyers (such as the military or telecoms) and the region's distance from core European markets and technological centres, it has been able to turn around some traditional sectors with low external links by supporting knowledge-based activities. Important programs in this respect include the creation of technology transfer centres in sectors such as mechanics (Meccano and Tecno Marche) and also traditional ones including food (Asteria) and furniture (Cosmob). For example, an electronic proto-cluster has developed in the area around Ancona due to the combination of the establishment of an engineering faculty and the experience and skills which had been nurtured in the now-declining musical district.

- **Active public and private actors who understand the need to focus on innovation and workforce development**. Regional leaders have identified key industrial clusters to focus support from EC funding for innovation: footwear, furniture and appliances, interior design, agriculture and agri-food and tourism. In this respect local private-sector players have started to build strategic alliances between very small firms in key sectors to overcome bottlenecks in access to credit/venture financing. Moreover, these strategies appear to be supported by the regional government (loan guarantees and interest-rate buy-down).

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.11).

- **Vulnerability to global competition especially in traditional sectors with low levels of innovation**. Marche's reliance on low-tech manufacturing in industrial districts leaves a number of traditional sectors vulnerable to foreign competition from emerging countries. Despite the region's gains in increasing the competiveness of industrial districts in recent years, challenges remain in traditional sectors, such as shoes, ship building, textile and furniture particularly in SMEs with levels of innovation unable to compete internationally due to competition of emerging countries.

- **Gaps in accessibility and ICT infrastructure** represent important bottlenecks in the region especially in its capacity in disseminating innovation around industrial clusters. A key success around building competitive industrial clusters has been through the establishments of incentives for SMEs to grow and build strategic alliances to reach economics of scale, in order to attain higher investments in R&D and become innovators capable of competing internationally. The gap in broadband/ICT expansion and the region's lower take up of broadband, particularly in the business sector, represents an important bottleneck to this last.

- **Weak access to credit and venture financing** has been an important bottleneck in capitalising SMEs, representing a major obstacle to the growth and development in the Marche region. The region appears to provide a relatively poor environment for financial, real estate intermediation, and business-related services with a difficult dialogue between the enterprises and banks. Self-financing remains the most important means to fund investments; without adequate access to credit, firms tend to stay small and the conditions are not conducive to undertaking investments in new ideas and projects, conserving the economic structure. A key challenge for the region will be overcoming bottlenecks in access to credit and venture financing.

- **The ageing population brings important challenges to the region** which has higher elderly dependency ratios (35%) than nationally (31%) and in OECD TL2 regions (21%). In recent years the region’s elderly dependency ratio has increased by five full percentage points, while it remained stable across Italy, bringing challenges and especially high costs of service delivery, such as health care, assistance, homecare and transport to the region. The regional government, while aware of the looming impact of ageing on the region’s economic performance, does not seem to be actively engaged in policy development to address the issue – nor do they seem to be addressing on a systematic basis the issue of the regulatory burden, either within the regional government or with their central government counterparts.

- **Inability to define and apply performance-based indicators** and measures across the broad spectrum of policy and programming from the European Commission, the central government and the region itself by regional authorities. Performance-based indicators can be an important tool to measure progress in achieving policy objectives and in measuring the impact on policy outcomes of the various policy tools. These tools can improve the functioning of policy involved in allocating significant amounts of financial resources invested in the region. The region has made important gains in this respect in recent years with a deep focus on measuring the impact of innovation policy. This is confirmed also by the indicator test accomplished for DG REGIO recently. Marche was one of the 10 regions in Europe which performed a review of its indicator.

Table 3.11. **Statistical summary, Marche**

	Period	Marche	Italy	OECD	National gap	OECD gap
Levels						
GDP pc	1995	20 627	21 213	18 926	97%	109%
	2007	27 072	26 544	24 597	102%	110%
GDP	2007	41 815	1 205 851			
GDP share	1995	2.65%	n.a.			
Productivity	1995	49 158	54 850	44 513	90%	110%
	2007	63 976	67 871	54 713	94%	117%
Area (in km^2)		9 694	301 336			
Area share of national		3.22%				
Population	2008	1 553 063	59 619 290	3 481 456		
Population share	2008	2.60%	n.a.	n.a.		
Population density	2008	148	198	263		
Elderly dependency ratio	2008	35%	31%	21%		
Youth dependency ratio	2008	20%	21%	28%		
Motorway density (p)	2007	0.11	0.11	0.20		
Motorway density (a)	2007	17.33	21.86	21.91		
Primary attainment % LF	2008	37.6%	38.6%	27.4%		
Tertiary attainment % LF	2008	16.2%	17.0%	26.0%		
Unemployment rate	2008	4.7	6.9	6.3	-2.25	-1.6
Employment rate	2008	65.8	60.4	66.7	5.36	-0.9
Long-term unemployment	2008	1.61	3.2	2.4	-1.54	-0.8
Youth unemployment	2008	12.47	20.9	15.3	-8.42	-2.9
Patent applications	2007	95.90	153.5	430.0		
Patents per million	2007	62.1	46.1	85.6		
R&D to GDP	2005	0.57%	0.89%	1.55%		
BERD to GDP	2005	0.25%	0.38%	0.93%		
GERD to GDP	2005	0.04%	0.16%	0.25%		
Changes						
GDP pc growth	1995-2007	2.29%	1.89%	2.2%		
GDP growth	1995-2007	2.91%	2.26%	2.8%		
Productivity growth	1995-2007	2.22%	1.79%	1.83%		
Population growth	1995-2008	0.60%	0.37%	0.6%		
WA population growth	1995-2008	0.30%	0.04%	0.8%		
Elderly dependency (pp change)	1995-2008	5.31	0.06	2.50		
Youth dependency (pp change)	1995-2008	0.84	0.00	-6.28		
Primary education (pp change)	1999-2008	-11.46	-9.62	-6.09		
Tertiary education (pp change)	1999-2008	2.42	5.01	5.84		
Employment rate (pp change)	1999-2008	5.03	5.91	1.87		
Unemployment rate (pp change)	1999-2008	-1.45	-4.57	-1.82		
Patents per million (pp change)	1995-2007	51.26	35.61	53.29		
R&D to GDP (pp change)	1995-2005	0.11	0.07	0.13		

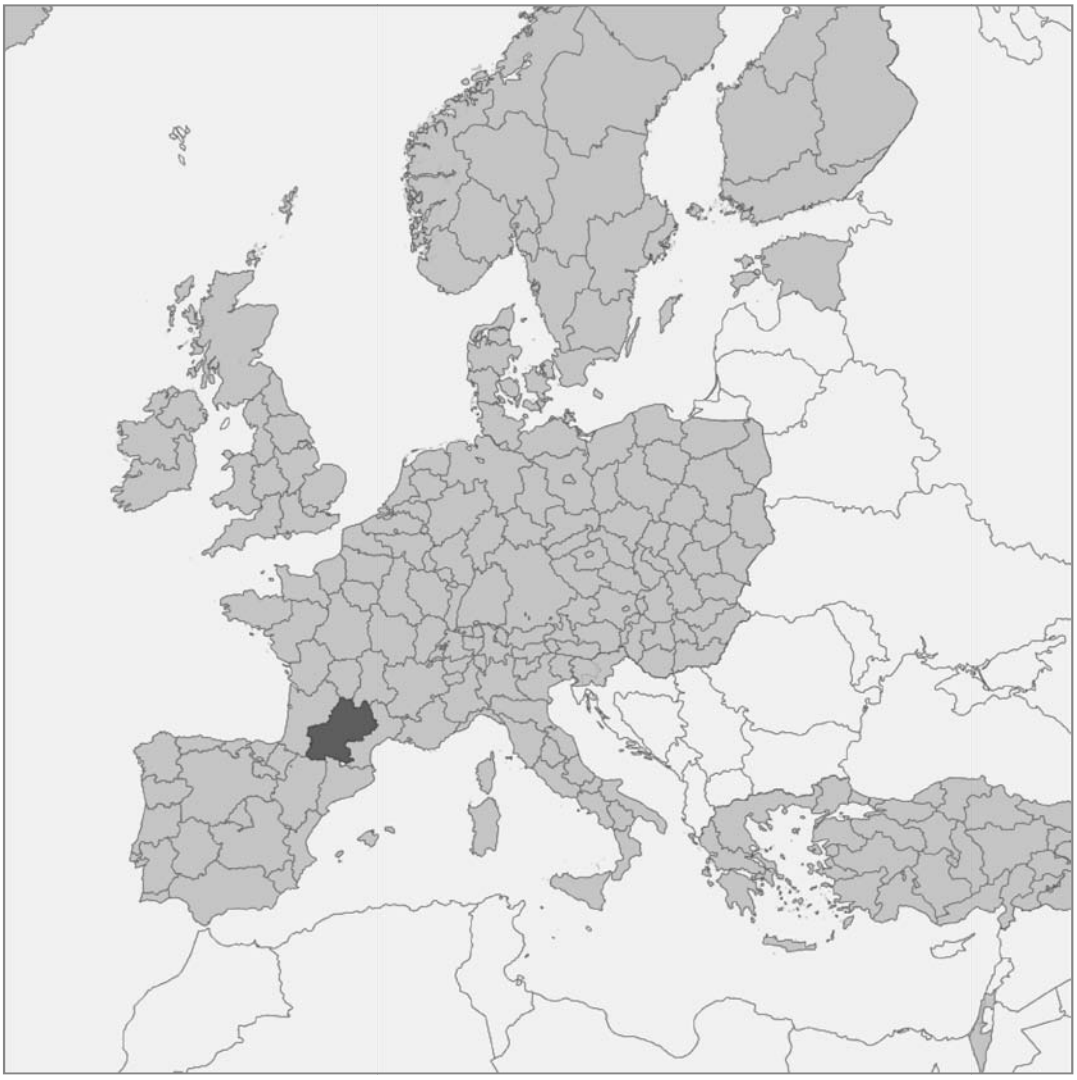
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Midi-Pyrénées, France

Figure 3.21. **Midi-Pyrénées, France**

Regional category: Catching-up potential and growing above the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Midi-Pyrénées (MiPi) encompasses eight smaller TL3 regions, Ariège, Aveyron, Haute-Garonne, Gers, Lot, Hautes-Pyrénées, Tarn and Tarn-et-Garonne. In 2007 its population was 2.8 million, around 4.5% of the national population. Population density, at 55 people per km^2, is lower than the average in French regions of 114. The region is located in southwest France, neighbouring Aquitaine to the west, Languedoc-Roussillon to the east and northeast, Auvergne to the north and Limousin to the northwest. To the south, the region shares a border

with Spain. The largest cities in the region are Toulouse with 850 873 inhabitants, followed by Montauban (55 927) and Albi (51 306). The region's structure is thus quite monocentric, centred around the capital city Toulouse. Less than half (45%) of its population live in rural communities, more than the average proportion in France (38%) and around the OECD average of 45%.

Midi-Pyrénées has received several important shocks to its economy in recent years. First the relocation of research units and institutions previously established in the Ile de France (e.g. Météo-France, the National Space Centre). In that context, the launching of the Airbus A-380 Superjumbo (a EUR 12 billion investment) in the mid-1990s had a major impact on the buoyancy of the regional economy which relies upon the dynamism of the aeronautical and space industries. The second important change came with the Chevenement law on inter-municipal structures (1998) accelerating and improving the governance of the urban community of the capital city, Toulouse (CUB). Finally the explosion in the AZF fertiliser factory plant in Toulouse in 2001 resulted paradoxically in the strengthening of the urban research potential with the establishment of the cancer centre (Canceropole) and the difficult restructuring of the traditional industries in the Tarn and Ariège basin also had a significant influence on the MiPi economy.

France is a unitary state with a three-tier system of sub-national government. The first tier consists of 26 regions (*régions*). The second tier includes 100 departments (*départements*) and the third tier 36 683 municipalities (*communes*). In 2006 20.2% of government spending was devolved while 16.2% of total revenue came from the regions. France significantly decentralised at the beginning of the 1980s, transferring homogenous blocks of responsibilities to the sub-national level. Regional councils were subsequently elected by direct universal suffrage. New laws in 2004 and 2005 reinforced the transfer of powers to the regions and the departments and, to a much smaller extent, to the communes. Competencies are now distributed as follows: *i*) economic development and vocational training are essentially assigned to the regions along with territorial planning; *ii*) major infrastructure projects (such as ports and airports) are assigned to the departments or the regions as appropriate; *iii*) roads are assigned to the departments; *iv*) social services, including health and services to the elderly, fall essentially to the departments; *v*) education and culture are shared among the different levels. However compared to recent decentralisation moves in Italy and Spain, the French reforms have not resulted in any institutional primacy for the region.

Economic assessment

The taxonomy classifies Midi-Pyrénées as a region with catching-up potential, growing above the national average. In 1995, GDP *per capita* was USD 20 094 in PPP terms, around 12% below the national average and 6% above the OECD average. Over the period 1995-2007, growth in GDP *per capita* amounted to 1.73%, slightly higher than the national rate of 1.62% and below the rate of growth in OECD TL2 regions of 2.2%. Consequently the gap in GDP *per capita* had closed by 2007 to just 11% below the national average while its initial lead with respect to the OECD average has vanished completely. The region's population grew at a rate of 0.96% over the period almost twice the national growth rate of 0.51% and OECD rate of 0.6%. GDP overall in the region grew at a rate of 2.7%, faster than the national rate of 2.2% but slightly below the OECD growth rate of 2.8%. Therefore the region's gains in GDP *per capita* have been driven by dynamism in both population growth and overall GDP growth.

Below we summarise how the region performs compared to national and OECD averages for five key indicators. Figure 3.22 summarises its performance against the national average.

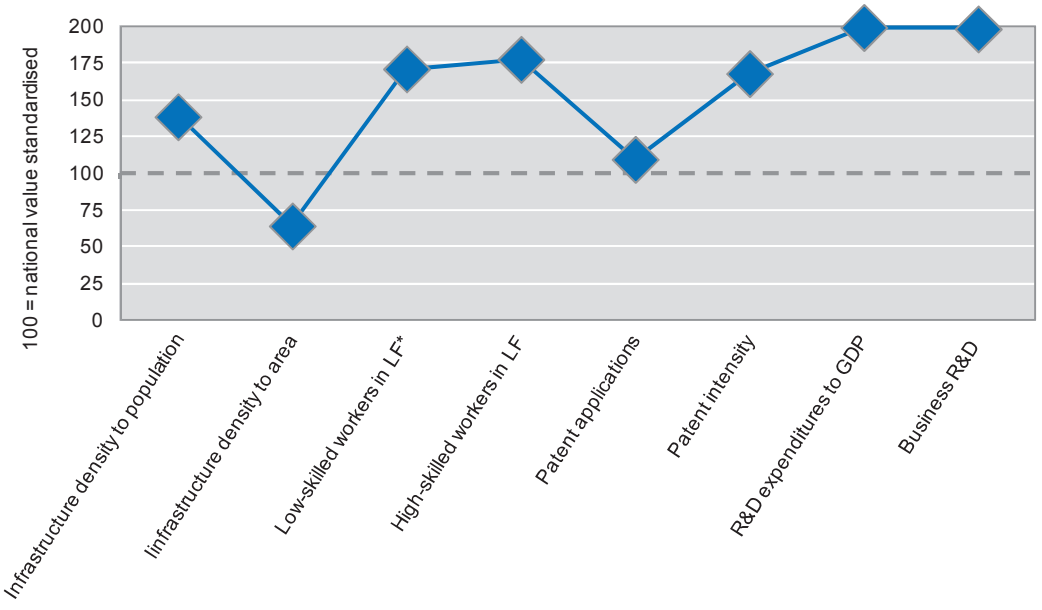
- **Productivity slightly trails the national average**. Productivity in MiPi – measured by GDP per employee – in 1995 stood at USD 53 432 expressed in PPP, around 11% lower than the national average but surpassing the OECD average by 20%. From 1995-2007, productivity in the region grew at a rate of 0.8%, slightly below the national average of 0.92% and well below the OECD average of 1.83%, so its gap with respect to national levels remained around 12% below, while the region was only 7% above the OECD average by 2008. The region's share of construction and manufacturing industries is relatively similar to the national composition. Although only 4% of the nation's industrial jobs are located in MiPi, its GVA share is 13%, the so called "Airbus" effect. Three industries provide 80% of the manufacturing employment: aerospace, employing 61 000 workers; information and communication technologies (39 000); and agriculture and food processing (26 000). Agriculture and food-processing also represents an important pillar to the region, generating EUR 3 billion in value-added. Organic agriculture is developing at a good pace but the sector as a whole suffers from a number of weaknesses due to its small farms, too wide a spectrum of activities and low density of production, all representing bottlenecks to productivity gains. The most important super-cluster (*pole de compétitivité*) is AESE (*Aéronautique, Espace et systèmes embarqués*), located in both the MiPi aerospace valley and in the neighbouring region of Aquitaine. Other super-clusters include AGRIMIP (food processing), the cancer Bio santé pole (with 3 500 researchers and 15 000 jobs) and EAU (water technologies) co-ordinated with Languedoc-Roussillon and PACA regions.
- **Labour market outcomes are superior to national standards.** The region's pre-crisis unemployment rates in 2008 were 6.4% as opposed to the national average of 7.3%, and around OECD levels. Long-term unemployment rates were lower (2% as opposed to 2.7%) as well as youth unemployment rates (16.2% as opposed to 17.7%). Employment rates, at 66.9%, were significantly higher than the national average of 63.7% and around the OECD average of 66.7%. Over the period 1999-2008, the region added 237 900 net jobs increasing the rate of employment by nine percentage points, around three more than the average for French regions.
- **Human capital indicators in the region are quite strong** with 20.1% of its workforce classed as low-skilled workers compared to 26.3% nationally and 27.4% on average in OECD TL2 regions in 2008. The region also has a higher share of highly skilled workers, 34.3% of the workforce, compared to an average of 27.8% for France and 26% for OECD regions. Over recent years, the gains in the proportion of highly skilled workers have been particularly significant, increasing by 8.3 percentage points above the average increase in French and OECD regions (see statistical annex). Midi-Pyrénées is still one of the French regions with the lowest score at the *baccalauréat* – the secondary education final exam – and faces important shortages of human capital in the seven departments outside the Haute Garonne.
- **Infrastructure is above national and OECD levels** in relation to its population. In 2008 infrastructure density – measured by kilometres of motorway to its population – was 0.23, higher than the average in French regions of 0.18 and in OECD regions of 0.20. Motorway density in relation to land area, however, is 14.38, below the average of French regions of 20.3 and OECD regions of 21.9. Local and regional infrastructure has improved a great deal over the last decade. The regional council has recently financed a special programme of EUR 820 million to modernise, expand and strengthen the railway network in the region. This rail plan has been interlinked with the general economic activity in the region. High-speed internet connections within the main economic areas are developing satisfactorily. The general

plan for broadband (*Schéma directeur*) has now been implemented in seven "departmental" areas and the creation by the government of a special fund for the digital society (*Investissement d'Avenir*) will help to consolidate those investments (an estimated investment of EUR 1.5 billion). The region's low population density brings a relatively high cost to extend broadband all over the region.

- **Innovation activity is quite strong** with 362 patent applications overall, higher than the average of French regions at 300 and slightly below that of OECD TL2 regions (430). In relation its population size, patent intensity is 128.3 almost twice the national average of 77.2 and significantly higher than the OECD average of 85.6. R&D expenditure is dominated by the private sector, which invests more than twice the amount invested by the public sector, although both are significantly higher than the national average. Businesses invest 2.57% of GDP on R&D, around ten times higher than the average private-sector expenditure in France (0.24%) and twice (0.93%) the average in OECD regions. Public-sector expenditure was 1% of GDP, also significantly higher than the typical expenditure in all French regions of 0.2% and OECD regions of 0.25%. The region supports four super-clusters and has multiple policies and programs to support innovation including the PIA call for tenders to develop skills in economics, nanotechnologies, ecology and robotics. MiPi will also be host of a Technological Research Institute (IRT) focused on aerospace technologies that will finance technological platforms together with private interests.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009). Figure 3.22 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region has adequate levels of the key drivers of regional growth including infrastructure despite lower infrastructure to its surface land, human capital and strong levels of innovation. A challenge for the region now is to transform innovation inputs into outputs more efficiently.

Figure 3.22. **How drivers of growth compare to the national average, Midi-Pyrénées, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of Midi-Pyrénées:

- **Innovation intensity driven by the aerospace cluster and active innovation-driven policy**. The aerospace cluster represents half of the industrial jobs in the region and provides the MiPi with an image of modernity. The MiPi region has actively engaged in supporting innovation-related activities establishing a regional innovation fund with a strong focus on vocational training involved in the application of a research and education plan (*Schéma de l'Enseignement Supérieur et de la Recherche or* SRESR). Only three regions in France have created such an integrated policy. Furthermore most universities and research institution have mobilised to respond to major calls for tenders linked with the government PIA (*Programme des investissements d'avenir*) and capture part of these public investments. A very interesting initiative is the establishment of the RIME, an information gathering program supported by public and private partnerships. This program aims at identifying economic and technological changes and produces an annual report drafted by industrialists (56 companies are members of RIME) and experts from innovation agencies. Its recommendations are used to ensure public policy making fits the needs of industry.

- **A high research potential**. Midi-Pyrénées ranks first in France in R&D expenditures to GDP and 8th in Europe even though these investments are concentrated in one sector and the region is not a capital. The region has 16 000 researchers, with 60% of them in the private sector. There are 110 000 students in the region, representing a very high research potential. The workforce is highly skilled, surpassing national and OECD standards considerably. An important driver has been the policy of relocation of plants, research units and institutions previously concentrated in Ile de France including AESE (*Aéronautique, Espace et systèmes embarqués*), the region's most important super-cluster.

- **High levels of international exposure.** The region has the highest export to import ratio in France. There have been initiatives to attract foreign students and professors, such as the Pierre de Fermat chairs. International excellence is clearly an objective for several HEIs including Paul Sabatier University, the well-known *Ecole d'économie de Toulouse*. MiPi is also the fourth region in France for foreign investment. At the beginning of 2009, 380 foreign-owned companies were operating in the region and employing 57 000 workers.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.12).

- **The decline of low-tech activities** in rural areas, such as textiles, leather and wood-working, is linked with significant gaps in human capital along with the difficult redevelopment of labour-intensive activities such as tourism. Access to training for job holders in the region is four percentage points below the national average in 2009. Access to professional training is lower than 10 years ago for certain labour market segments. At the same time the share of tertiary education graduates has increased and is higher than the national average. This paradox originates in the dramatically different labour markets across the region. On the one hand, there is the growing Toulouse metropolis, while on the other middle-range cities on the periphery of the region are still struggling to restructure their economic base. The skills shortage in non high-tech industries, the declining number of secondary education technological graduates and the increasing number of dropouts from vocational training are generating persisting labour market fragmentation.

- **Fragmented labour markets reduce the growth potential of the region** and bring important challenges to governance. Development in one area has become disconnected from other labour markets in the region, increasing spatial inequalities and forming a significant bottleneck to technology transfers into other sectors. Furthermore it brings complexity and challenges to regional governance especially in the provision of goods and services in fragmented labour markets and in remote areas. The co-ordination instruments employed by the region include contractual agreements (particularly those involving the regional government) as well as a number of planning documents (e.g. SRDE, Training Plan) and collaborative bodies (such as co-ordination committees on vocational training and R&D). However these bodies are still not adequately designed and do not leave much room for the private sector.

- **Spatial planning, especially urban planning,** remains **underdeveloped**. In Toulouse the central districts still have not been rehabilitated. Programmes to enhance public transport in the city, such as the extension of the tram and underground network have been very slow to materialise.

- **Infrastructure gains could improve internal and external accessibility**. Although motorway density in proportion to its population is above national levels, it is low in relation to land area. The high-speed rail connection between Bordeaux and Paris is not expected before 2020 and there are no plans to connect Toulouse and Narbonne (Languedoc) in the near future. Currently there are no highways connecting Toulouse to Castres or St. Gaudens. Missing infrastructure links across the Pyrenees are hindering trade with Spain. The project of a central crossing of the Pyrenees is still under discussion. Inadequate internal communication creates a bipolar and fragmented labour market, where on the one hand the intense research and development is highly concentrated around the Toulouse metropolis attracting migrants and notably population, and quite disconnected from the rest of the region and the seven departments outside Haute Garonne.

Table 3.12. **Statistical summary, Midi-Pyrénées**

	Period	Midi-Pyrénées	France	OECD	National gap	OECD gap
Levels						
GDP pc	1995	20 094	22 879	18 926	88%	106%
	2007	24 677	27 732	24 597	89%	100%
GDP	2007	69 243	1 323 439			
GDP share	1995	4.04%	n.a.			
Productivity	1995	53 432	60 025	44 513	89%	120%
	2007	58 760	67 010	54 713	88%	107%
Area (in km^2)		45 348	543 965			
Area share of national		8.34%				
Population	2008	2 806 000	61 771 000	3 481 456		
Population share	2008	4.54%	n.a.	n.a.		
Population density	2008	55	114	263		
Elderly dependency ratio	2008	29%	28%	21%		
Youth dependency ratio	2008	26%	27%	28%		
Motorway density (p)	2007	0.23	0.18	0.20		
Motorway density (a)	2007	14.38	20.30	21.91		
Primary attainment % LF	2008	20.1%	26.3%	27.4%		
Tertiary attainment % LF	2008	34.3%	27.8%	26.0%		
Unemployment rate	2008	6.4	7.3	6.3	-0.95	0.1
Employment rate	2008	66.9	63.7	66.7	3.27	0.3
Long-term unemployment	2008	2.01	2.7	2.4	-0.72	-0.4
Youth unemployment	2008	16.21	17.7	15.3	-1.53	0.9
Patent applications	2007	362.43	299.7	430.0		
Patents per million	2007	128.3	77.2	85.6		
R&D to GDP	2005	4.15%	1.54%	1.55%		
BERD to GDP	2005	2.57%	1.02%	0.93%		
GERD to GDP	2005	1.00%	0.19%	0.25%		
Changes						
GDP pc growth	1995-2007	1.73%	1.62%	2.2%		
GDP growth	1995-2007	2.71%	2.17%	2.8%		
Productivity growth	1995-2007	0.80%	0.92%	1.83%		
Population growth	1995-2008	0.96%	0.51%	0.6%		
WA population growth	1995-2008	0.96%	0.54%	0.8%		
Elderly dependency (pp change)	1995-2008	0.81	0.03	2.50		
Youth dependency (pp change)	1995-2008	-0.19	-0.02	-6.28		
Primary education (pp change)	1999-2008	-7.32	-8.77	-6.09		
Tertiary education (pp change)	1999-2008	8.30	7.12	5.84		
Employment rate (pp change)	1999-2008	9.25	6.25	1.87		
Unemployment rate (pp change)	1999-2008	-4.75	-5.16	-1.82		
Patents per million (pp change)	1995-2007	85.26	52.19	53.29		
R&D to GDP (pp change)	1995-2005	1.21	0.30	0.13		

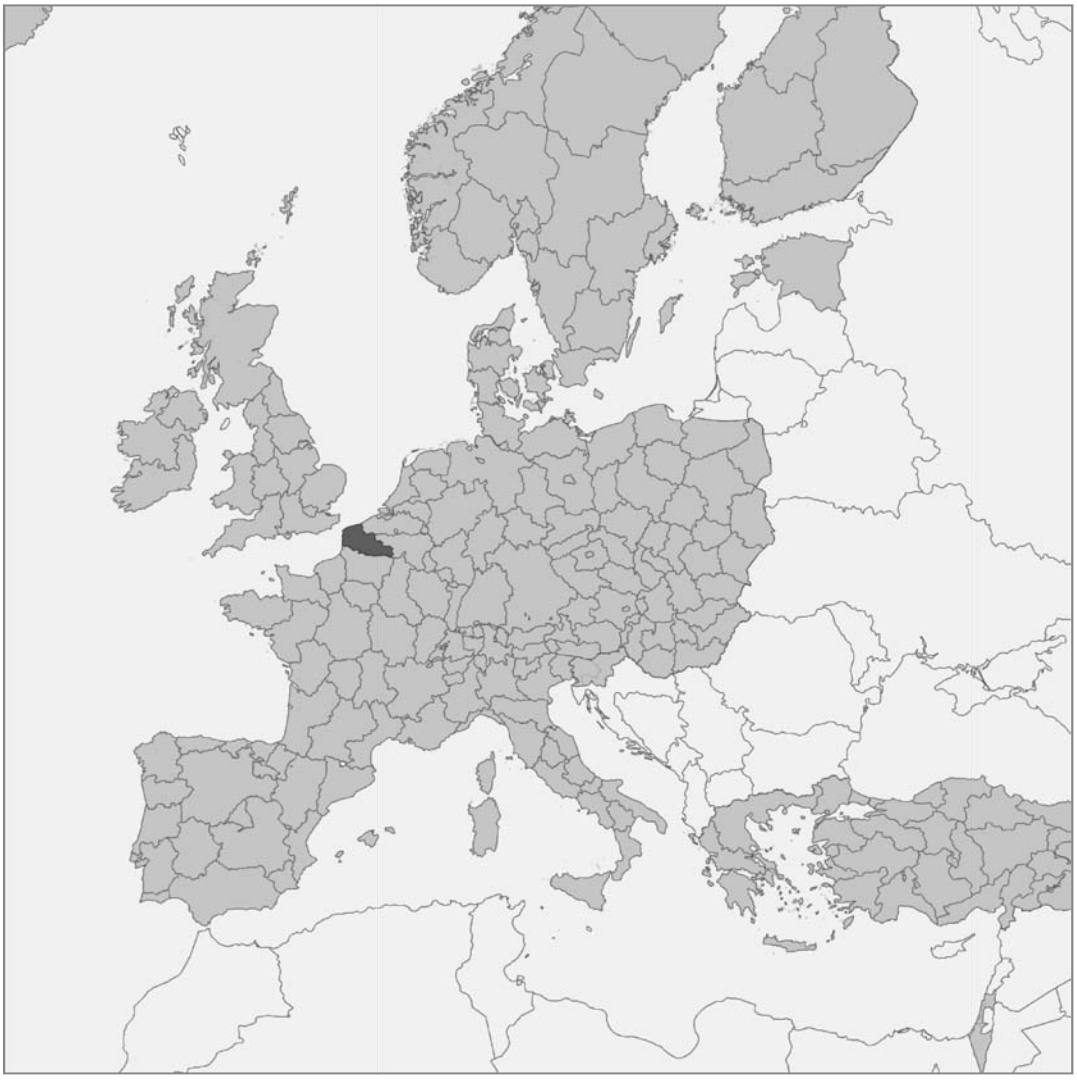
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Nord-Pas de Calais, France

Figure 3.23. **Nord-Pas de Calais, France**

Regional category: Catching-up potential and growing below the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Nord-Pas de Calais encompasses two smaller TL3 regions, Nord and Pas de Calais. In 2007 its population was 4 million, around 6.5% of the national population. Its population density at 321 people per km^2 is higher than the average in other French regions of 114. The region is located in the most northern part of France

with Belgium to its north and Picardie to its south. Nord-Pas de Calais is also close to the United Kingdom, 43 km across the Channel, connected by the Channel Tunnel and ferries. The largest cities in the region are Lille, with around 1.5 million inhabitants, followed by Roubaix (97 000) and Tourcoing (94 000). The region's city structure is thus quite monocentric, concentrated around the capital city, Lille. Only 12% of the population live in rural communities, significantly lower than the French average of 38% and the OECD average of 45%.

The Nord-Pas de Calais economy has received two important shocks to its economy in recent years. First, a difficult ongoing economic restructuring as the region makes the transition from its traditional textile, coal, iron and steel industries towards a more modern economic base with higher value-added industrial activities and more emphasis on services. The second important shock has come with the building of the Channel Tunnel in 1994 along with the new high-speed railway line to Paris and Brussels facilitating economic change and creating the conditions for the modernisation and expansion of the Lille metropolis. New investment in regional trains (TER) and the new Seine-Nord Europe canal linking the region with Île-de-France will reinforce this trend. The city of Lille is already equipped with a modern underground and good transit networks. This infrastructure and its status as the European capital of culture in 2004 have done much to improve the city's image.

France is a unitary state with a three-tier system of sub-national government. The first tier consists of 26 regions (*régions*). The second tier includes 100 departments (*départements*) and the third tier 36 683 municipalities (*communes*). In 2006 20.2% of government spending was devolved while 16.2% of total revenue came from the regions. France significantly decentralised at the beginning of the 1980s, transferring homogenous blocks of responsibilities to the appropriate sub-national levels. Regional councils were subsequently elected by direct universal suffrage. New laws in 2004 and 2005 reinforced the transfer of powers to the regions and the departments and, to a much smaller extent, to the communes. Competencies are now distributed as follows: *i*) economic development and vocational training are essentially assigned to the regions along with territorial planning; *ii*) major infrastructure projects (such as ports and airports) are assigned to the departments or the regions as appropriate; *iii*) roads are assigned to the departments; *iv*) social services, including health and services to the elderly, fall essentially to the departments; and *v*) education and culture are shared among the different levels. However compared to recent decentralisation moves in Italy and Spain, the French reforms have not resulted to any institutional primacy for the region.

Economic assessment

The taxonomy classifies Nord-Pas de Calais as a region with catching-up potential, growing below the national average over the period 1995-2005. When considering more recent data, the assessment would be adjusted to growing above the national average over the period 1995-2007. The faster *per capita* growth rates are mainly driven by lower population increases rather than GDP improvements, as will be discussed below, and therefore for analytical purposes the original classification stands. In 1995, GDP *per capita* was USD 17 938 in PPP terms, around 22% below the national average and 5% below the OECD average. GDP *per capita* grew 1.8%

over the following 12 years, slightly above the national pace of growth of 1.62% and below the rate in OECD TL2 regions of 2.2%. Consequently the gap with the rest of the country closed by 20% but widened by 10% with respect to the OECD regions. The region's GDP grew overall at a rate of 1.8%, more slowly than the national rate of 2.2% and the OECD average of 2.8%. Because the population also grew at a much lower rate (0.07%), than nationally (0.51%) and in OECD TL2 regions (0.6%), the relative improvement in GDP *per capita* in the region is mainly driven by lower population rises rather than faster GDP growth.

Below we summarise how the region performs compared to national and OECD averages for five key indicators. Figure 3.24 summarises its performance against the national average.

- **Productivity is lagging.** Productivity in the region – measured by GDP per employee – was USD 55 490 in PPP in 1995, around 8% below the national average but 25% above the OECD average of 44 513. From 1995-2002, productivity grew at a rate of 0.56%, significantly lower than the national average of 0.92% and the OECD average of 1.83%, increasing the productivity gap to 11% below the national average, and leaving the region only 8% above the OECD average. This gap can be explained by an ongoing restructuring process in the region and a recent trend in the regional economy focusing on non-high tech and relatively low value-added activities. The largest sector in the region is services, employing 64.4% of the workforce, followed by industry at 25.3% and construction at 9.2%. Within industry the most important sub-sectors are the automobile industry, with a turnover in 2008 of EUR 15 billion and 21 100 employees, and the agriculture and food processing industry, with a turnover of EUR 10 billion and 27 300 employees. Other manufacturing sectors include textiles and clothing, railway equipment, metallurgy and mineral products.

- **Labour market outcomes are below French standards.** The region's pre-crisis employment rate was 58%, lower than the French rate of 63.7% and the OECD TL2 region average of 66.7%. Unemployment rates are also higher at 11.4% against the French average of 7.3% and the OECD average of 6.3%, as are long-term unemployment rates (5% compared to the national rate of 2.7%) and youth unemployment rates (26.9% compared to the national rate of 17.7%). The employment rate improved over the period 1999-2008 by 6.8 percentage points, about the same as the national average, and unemployment rates have decreased more (6.7 pp compared to the national fall of 5.16 pp and the OECD region average of 1.82 pp). Nord-Pas de Calais is a region with a high density of people with low incomes and has the highest concentration of people in the country benefitting from Revenu de Solidarité Active (RSA), the French unemployment subsidy, with 47.1 per thousand inhabitants against 28.1 for France as a whole. Income disparities are particularly high in Nord-Pas de Calais. The increasing trend in the number of people receiving the transition to work assistance also shows a growing gap with the rest of the country since the year 2000.

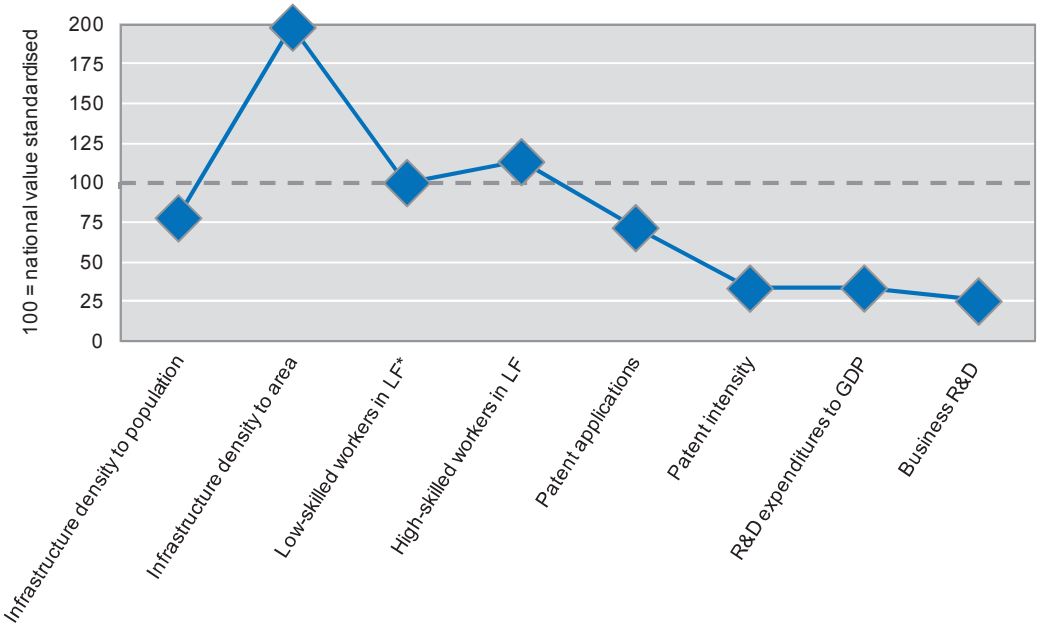
- **Human capital has been improving strongly in recent years**. In 2008, Nord-Pas de Calais had a higher share of highly skilled workers, at 28.7% of its labour force compared to the national share of 27.8% and the OECD TL2 region average of 26%. The proportion of low-skilled workers is 26.3%, around the average in French regions and slightly below the OECD average of 27%. In recent years the region has made significant gains this area, surpassing gains made nationally. The proportion of low-skilled workers fell by 12 percentage points while the proportion of highly skilled workers rose by 10 percentage points (see Table 3.13). These gains can partly be explained by the significant presence of higher education institutions in the region. The number of students is estimated at around 111 000 in universities and around150 000 in universities and *grandes écoles*. The number of students in *grandes écoles* in the region is the third highest in France after Paris-Versailles and Lyon.

- **The region enjoys adequate levels of infrastructure.** Motorway density – measured by kilometres of motorway to its population – was 0.15, below the average value of French regions at 0.18 and OECD TL2 regions at 0.20. Motorway density in relation to the region's land area was 50.5, more than twice the national figure of 20.3 and the OECD average of 21.9. The region's accessibility has improved in recent years with the arrival of the high-speed railway lines linking the Lille metropolis to Paris and Brussels. Accessibility within cities is also adequate with the city of Lille enjoying a modern underground system and good transit networks. Secondary cities are also endowed with tramway networks including Valenciennes, Lens, Douai and Bethune. New railway links have been established such Lille-South bound, Arras-Cambrai and tram/train links in Lille. Infrastructure policies have tried to balance intra- and inter-regional links.

- **Innovation activity lags national and OECD standards**. Nord-Pas de Calais has fewer patent applications (112) than the average for French regions of 300 and the OECD TL2 regions of 430. Patent intensity in relation to the population, at 27.8, is less than half the national rate of 77.2 and of the OECD average value of 85.6. Expenditure on R&D amounts to 0.67% of GDP, significantly below national and OECD levels of 1.54% and 1.55% respectively. Private R&D expenditure is 0.29% of GDP, around one-third of the typical French share of 1.02% and the OECD region average of 0.93%. Despite this, the region has made important gains in recent years and is home to various technology "super clusters", although the effect of these clusters on overall innovation intensity is still limited.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended side-effects stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.24 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region has low levels of infrastructure in relation to its population, but above average in relation to its area. It also has adequate levels of human capital; the region's key challenge lies in its innovation intensity.

Figure 3.24. **How drivers of growth compare to the national average, Nord-Pas de Calais, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of Nord-Pas de Calais:

- **Significant concentrations of clusters and poles of competitiveness** (super clusters), even though their effect on the region's innovation intensity and technology transfers is still limited. There are seven of these super clusters in Nord-Pas de Calais, the most important being I-Trans, a global railway technology super clusters implementing government-supported projects amounting to EUR 228 million, followed by TEAM2 (ecotechnologies), MAUD (materials), UP-TEX (high tech textiles), NSL (nutrition/health biotech), PICOM (Trading services engineering) and Aquimer (food processing).

- **Attractive higher education institutions (HEIs)**. The region's HEIs, especially Lille's, perform quite well and offer a wide spectrum of long and short training programmes. They attract students from Nord-Pas de Calais and neighbouring regions, and although the region suffers from brain drain with many graduates leaving the region to find jobs elsewhere, recent gains in highly skilled workers can to a certain extent be attributed to their presence in the region.

- **Urban dynamism, particularly in Lille,** with new commercial districts (Euralille) resulting in the creation of 69 000 highly skilled metropolitan jobs making Lille the third city after Lyon and Toulouse, excluding Paris, for the creative class. The areas of

Roubaix/Tourcoing Valenciennes and Lens areas have also seen active creation of jobs and firms with 20 000 new jobs in Valenciennes and 13 000 new jobs in Lens in the last ten years.

- **Growing service sector.** The region experienced a surge in the service sector mainly in construction, trade, tourism, education, health and passenger transport services. This can be attributed to a variety of factors, including the improvement of the region's accessibility, gains in HEIs, and improving the 'brand' of the city.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.13).

- **Persistently weak levels of R&D investments and private sector involvement**. The region ranks lowest among French regions for private research and development *per capita*. The share of R&D spending coming from the private sector has fallen from 55% in 1998 to 46 % in 2006 while the share in the country as a whole remained at 64% during the same period. National and regional development policies (SRDE) have not triggered any positive trend in R&D spending or the number of researchers.

- **Limited entrepreneurial culture**. The region's inhabitants are biased in favour of employment in large companies due to the historical weight of big enterprises in the regional economy and low levels of private initiatives, though Nord-Pas de Calais is home to a number of large family enterprises. The region is lagging in technology transfer and consultancy activities. The tertiary education institutions have not created a project culture and have not been very active in teaching entrepreneurship. Enterprise creation has increased with the assistance of the regional council (for example providing financial support to the creators of university enterprises) but company start-up rates are still lower than the national average. Furthermore the region's international policy is weak and regional policy assessment processes are insufficiently developed.

- **Wasted human potential.** A significant cohort of young people leave school without graduating and illiteracy persists. Levels of success in the *baccalauréat* exam (the secondary education final exam) are very low, coming second to last nationally, ahead only of Corsica. This underperformance cannot be explained entirely by the over-representation of working-class children. Other factors such as lower parental commitment, low expectations of the education system or low teacher student ratios also play a role.

- **Improved accessibility and a prime location have not yet fully translated into economic gains.** Despite the region being relatively close to large growth centres such as Brussels, London and Paris, and improved accessibility in recent years, improvements have not been seen in employment trends and insufficient business activity. Moreover the region displays relatively weak trans-border co-operation despite its participation in two European Groupings of Territorial Cooperation (EGTC). The Nord-Pas de Calais large cities network has had a lower effect on regional growth compared to other European regions with a similar urban pattern (such as in northern Italy or Baden Wurttemberg) resulting in fewer creative jobs and large social disparities.

Table 3.13. **Statistical summary, Nord-Pas de Calais**

	Period	Nord-Pas de Calais	France	OECD	National gap	OECD gap
Levels						
GDP pc	1995	17 938	22 879	18 926	78%	95%
	2007	22 223	27 732	24 597	80%	90%
GDP	2007	89 377	1 323 439			
GDP share	1995	5.22%	n.a.			
Productivity	1995	55 490	55 707	44 513	100%	125%
	2007	59 336	61 300	54 713	97%	108%
Area (in km^2)		12 414	543 965			
Area share of national		2.28%				
Population	2007	4 021 500	61 771 000	3 481 456		
Population share	2007	6.51%	n.a.	n.a.		
Population density	2007	321	114	263		
Elderly dependency ratio	2008	22%	28%	21%		
Youth dependency ratio	2008	31%	27%	28%		
Motorway density (p)	2007	0.15	0.18	0.20		
Motorway density (a)	2008	50.51	20.30	21.91		
Primary attainment % LF	2008	26.3%	26.3%	27.4%		
Tertiary attainment % LF	2008	28.7%	27.8%	26.0%		
Unemployment rate	2008	11.4	7.3	6.3	4.07	5.1
Employment rate	2008	58.0	63.7	66.7	-5.68	-8.7
Long-term unemployment	2008	5.04	2.7	2.4	2.32	2.7
Youth unemployment	2008	26.92	17.7	15.3	9.18	11.6
Patent applications	2007	111.75	299.7	430.0		
Patents per million	2007	27.8	77.2	85.6		
R&D to GDP	2004	0.67%	1.54%	1.55%		
BERD to GDP	2004	0.29%	1.02%	0.93%		
GERD to GDP	2004	0.05%	0.19%	0.25%		
Changes						
GDP pc growth	1995-2007	1.80%	1.62%	2.2%		
GDP growth	1995-2007	1.83%	2.17%	2.8%		
Productivity growth	1995-2007	0.56%	0.80%	1.83%		
Population growth	1995-2007	0.07%	0.51%	0.6%		
WA population growth	1995-2008	0.22%	0.54%	0.8%		
Elderly dependency (pp change)	1995-2008	1.56	0.03	2.50		
Youth dependency (pp change)	1995-2008	-4.58	-0.02	-6.28		
Primary education (pp change)	1999-2008	-12.36	-8.77	-6.09		
Tertiary education (pp change)	1999-2008	10.21	7.12	5.84		
Employment rate (pp change)	1999-2008	6.81	6.25	1.87		
Unemployment rate (pp change)	1999-2008	-6.72	-5.16	-1.82		
Patents per million (pp change)	1995-2007	15.47	52.19	53.29		
R&D to GDP (pp change)	1995-2004	0.19	0.30	0.13		

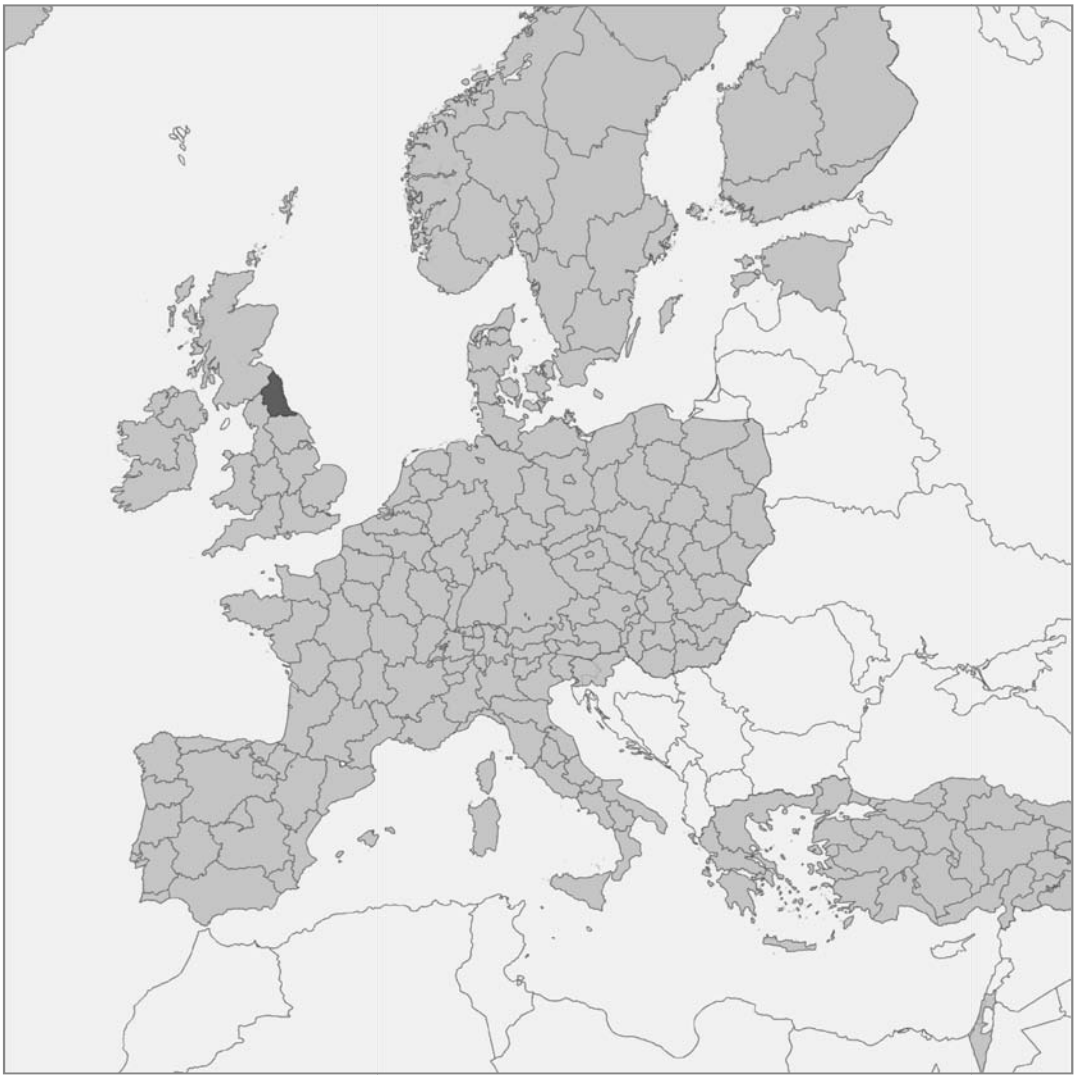
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

North East (Tyne and Wear), United Kingdom

Figure 3.25. **North East (Tyne and Wear), United Kingdom**

Regional category: Catching-up potential and growing below the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

This case study concentrates particularly on the functional city region of Tyne and Wear (TWCR), given that sub-national economic policy making in the UK focuses on this level, following the decision to abolish the regional tier which existed at the time of undertaking this case study. The TWCR is the economic core of the larger TL2 region. The territory within the city region includes all five local authority areas within the county of Tyne and Wear (Newcastle, Gateshead, North Tyneside, South

Tyneside and Sunderland) and linked parts of Northumberland and County Durham. These broadly correspond to four OECD TL3 regions (Tyneside, Sunderland, Northumberland and Durham CC) which, under new arrangements in the UK have come together in the new North East Local Enterprise Partnership (LEP). The larger TL2 region of the North East comprises these four TL3 regions along with three others located to the south (Hartlepool and Stockton-on-Tees, South Teesside, and Darlington).

In 2007, the North East had a population of 2.6 million, around 4.2% of the United Kingdom (UK) population. Of these, two-thirds (1.65 million) live within the TWCR. Population density in the region is 301 people per km^2, higher than the UK density of 250 Density in the TWCR is even higher given its boundaries around the functional urban areas in the north of the region.

The region is located in the northeast of the UK, neighbouring Yorkshire and the Humber to the south, the North West to the west and Scotland to the north. The structure of the TWCR economy has been changing over recent years as the economic roles of the two main cities, Newcastle upon Tyne (292 200 inhabitants) and Sunderland (283 500), and other smaller centres, have evolved. There are four substantive and overlapping labour market areas: Newcastle and the north, Central Sunderland, Washington, and Durham City. Whilst they vary in scale significantly, each makes a contribution to economic growth and employment in the TWCR, although the labour market of Newcastle and the north is by far the largest and the influence of Newcastle as an economic centre has continued to grow as the city has developed as the primary service centre in the TWCR. Its functional labour market takes in Gateshead, North Tyneside, much of south and east Northumberland and northern parts of Durham. Meanwhile, the economy of Sunderland has remained more localised, providing an employment and service centre for most of its own population and towns in the southeast of the city region and South Tyneside. There are other smaller nodes of employment, including the city of Durham which plays a role as an administrative centre for County Durham and a centre for education and tourism, hosting one of the UK's leading universities and a number of historic sites. Washington, which is equidistant from Newcastle and Sunderland, is a centre for the city regions' manufacturing sectors. Overall, economic linkages between towns and cities within the TWCR exist at different levels with Gateshead, North Tyneside and parts of Northumberland now strongly linked to Newcastle. However, other parts of the labour and housing markets in Tyne and Wear are more localised with less intense, but developing, connections to the wider city region, creating a degree of fragmentation within its functional borders. Newcastle and the north, and Durham face similar challenges and opportunities, albeit on different scales, while Central Sunderland and Washington could be defined as "economies in transition", with an ongoing need to generate new employment to offset the continued employment decline predicted in their industrial bases. Analysis of the distribution of employment and opportunities for growth between 2000 and 2008 highlight that there are clusters of employment across the TWCR and that there were a range of potentially attractive investment locations. The city centres of Newcastle (including the shared "Waterfront" with Gateshead), Sunderland and Durham offer a combination of higher education, cultural and tourism assets, retail and an evening economy with significant public administration and financial, professional and business services. Out-of-town sites play an important role as locations for concentrations of sector-specific employment. Such locations are spread across the city region and include the Cobalt

Business Park, Team Valley, Washington, Doxford International Park, Gosforth, Cramlington, Northumberland Business Park and Riverside locations. Other locations provide a more local economic focus for their hinterlands including Morpeth, Blyth, Hexham, Corbridge, Consett and Chester-le-Street.

In recent years the city region's productive structure has been undergoing a phase of intense economic restructuring from being a globally important industrial hub during the early part of the 20th century producing 25% of the world's ship-building output. From the middle of the 18th to the end of the 19th century, the growth of the region's economy was linked primarily to steam-age technologies and interlocked clusters of coal, iron, steel, armaments, ship building and heavy engineering industries. The decline became noticeable by the 19th and early 20th century and accelerated in the second half of the 20th century as the region struggled to maintain competiveness and productivity which triggered the nationalisation of coal, steel and ship-building industries. This was followed by a wave of re-privatisation and industry closures during the 1980s and early 1990s. The decline of traditional industrial production brought a phase of structural change with some modernisation of traditional sectors and diversification into new ones in the service and cultural sectors. However, the private sector has remained weak and the economy has been underpinned by public sector activities and jobs. Manufacturing remains a key sector.

An additional important factor influencing the region's production structure came with the period of institutional weakness and instability in the UK, which has impacted on the North East, most recently with the abolition of Regional Development Agencies operating at TL2 level, and the creation of Local Enterprise Partnerships to work at the level of the "functional economy". Whilst competencies for LEPs are still being determined as the new arrangements evolve, the geography of the LEP represents a degree of continuity from previous collaborative structures. The Tyne and Wear City Region Development Programme was published in 2004 and the Tyne and Wear City Region Economic Review in 2006 and in 2009. The latter reports suggested supporting collaborative structures focusing on shared economic challenges; skills, transport, housing and low carbon industrial opportunities. Despite these initiatives, the city region has seen less bottom-up organisation of key stakeholders than in other city regions in the north of the UK to provide ongoing stability during the period of institutional change.

Economic assessment

The taxonomy classifies the North East as a region with catching-up potential, growing below the national average. In 1995 its GDP *per capita* was USD 18 533 in PPP, around 17% lower than the national average and 2% below the OECD average for TL2 regions. Over the period 1995-2007, GDP *per capita* grew at a rate of 1.92%, below both the national growth rate of 2.53% and the OECD TL2 growth rate of 2.2%. Consequently the gap in GDP *per capita* widened over this period to 23% below the national average and 5% below the OECD average. Population in the region declined by 0.07%, at a time when in population in the UK regions increased by 0.35%, and in OECD TL2 regions by 0.6%. GDP overall grew at 1.9%, below the national rate of 2.9% and that of the OECD TL2 regions of 2.8%.

The performance by the TWCR has surpassed that of the wider region. The five urban districts at the core of the city region in particular experienced overall GVA growth (at current prices) of 70%, against the GVA growth in wider region

of 53%. Consequently their contribution to regional GVA increased from 44% in 1995 to 47% by 2005. Adding the two rural counties of Northumberland and Durham, total GVA growth for the seven areas was 58% contributing to 72% of the region's GVA growth in 1995 and rising to 74% by 2005.

Below we summarise how the region performs compared to national and OECD averages for five key indicators. Figure 3.26 summarises its performance against the national average.

- **Productivity is falling behind.** In 1995, productivity – measured by GDP per employee – stood at USD 47 028 in PPP in the North East, 3% below the national figure but surpassing the level of OECD TL2 regions by 6%. From 1995-2007, productivity grew in the region at a rate of 0.75%, around one-third of the national rate of 2.23% and around half the OECD average rate of 1.83%. Consequently the productivity gap widened to 18% below the national average and 6% below the OECD average. At the level of the TWCR, productivity growth in recent years – measured by GVA per worker – shows a brighter picture, outperforming national productivity growth by 1.7 percentage points with an annual growth rate of 6.3% against the national pace of 4.6% over 2000-07. This was driven partly by the workforce increasing at a slower rate than nationally. Newcastle is the only local authority within the TWCR with productivity levels above the British average.
  - Lower productivity levels in the TWCR and the larger region are due to a profound structural change during the past decades shifting from a declining manufacturing sector towards public and private sector jobs. Jobs in manufacturing fell by 24 500 from 2000 to 2007, while public sector jobs increased by 32 200 and professional, financial and business services jobs grew by over 40 000. The TWCR's four most important sectors measured by contribution to GVA are financial and business services (27% of GVA); public services (23%); distribution and hospitality (16%); and manufacturing, including traditional and light manufacturing (14%). The city region hosts a small group of world-class companies (e.g. Sage plc and Nissan). Prior to the financial crisis the Northern Rock bank was an important hub of the region's financial services sector. There has also been a strong investment in the cultural sector in recent years with a number of world-class sites around the Newcastle-Gateshead Quayside and in the city of Durham. Clusters in engineering and automobiles, creative and cultural industries, tourism, business and professional services, contact centres, bioscience and environmental industries support these firms. Universities play an important role, in particular the four universities based in Newcastle, Sunderland and Durham, making the city region a net importer of undergraduates. There is a strong public sector presence across the city region supporting local government, the health sector and education, and some key functions of national government departments and agencies. The public sector forms a disproportionate part of the region's economy, compared with other parts of the UK due to the underlying weakness of the private sector.
- **Labour market outcomes in the region are not spectacular** although the region made important employment gains in the years prior to the financial crisis. The region's pre-crisis unemployment rate was 7.6%, compared to the national rate

of 5.7%. The long-term unemployment rate was 1.83% compared to 1.4% nationally and youth unemployment was 18.3% as opposed to 14.9% nationally. The employment rate in the region increased considerably over 1995-2008, gaining 7.29 percentage points to 68.5%, significantly more than the average rise in UK regions of 2.33 percentage points but remaining below the national rate of 71.5%. The city region has played a particular role in the overall employment gains, increasing its employment rate from 67% in 2000 to 71.5% in 2008. This was partly due to the large drop in welfare benefit claimants from 2000 to 2008, and the relocation of civil services activities and jobs outside of London and the South East as part of a process of efficiency savings launched by the former government's Gershon Review and the associated Lyons Relocation Review. The city region has benefitted from this latter policy with an increase of over 20 000 public administration jobs from 2000 to 2008. However, it is now experiencing challenges as public sector austerity is leading to significant reductions in employment

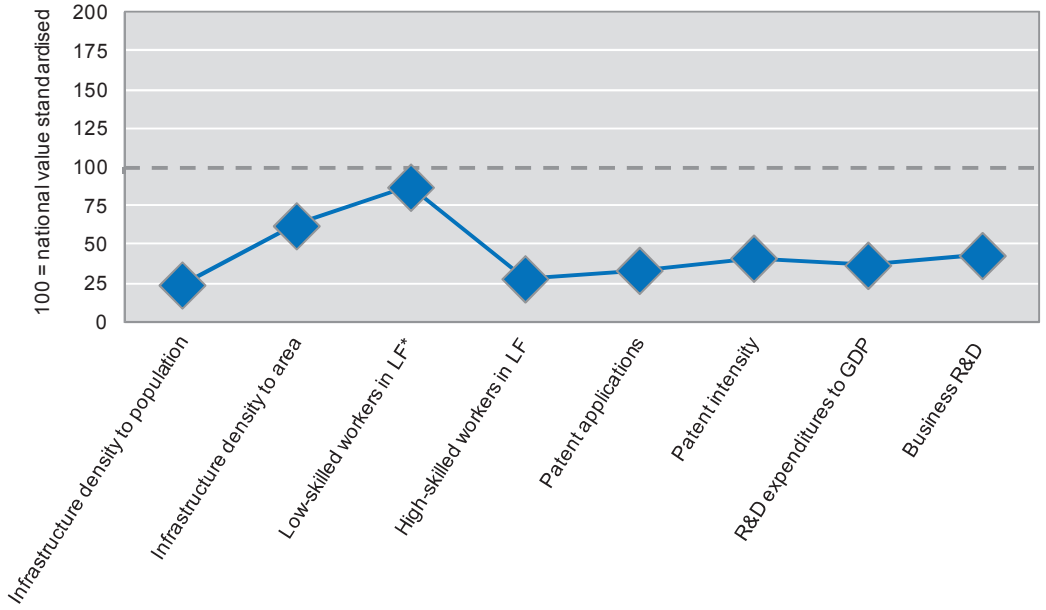
- **Human capital still lags behind** despite recent gains. The share of low-skilled workers – those with only primary educational attainments – in the region's labour force is 22.5%, slightly higher than the share in the remaining UK TL2 regions (22%). The proportion of highly skilled workers is 29.2%, as opposed to 34.6% in the UK regions. Over the period 1999-2008 the share of highly skilled workers has increased significantly, by 4.6 percentage points against 0.05 nationally. The city region also has a higher proportion of low-skilled workers than nationally and a lower proportion of highly skilled workers: around 64.5% of the working age population have a level 2 qualification, compared to 63.2% for England. At level 3 and above, the TWCR has 42.4% achieving level 3 compared to 44.9% for England, and the gap increased at level 4, with only 23.5% compared to a national average of 27.1%. The recent gains can in part be attributed to the university sector, making the city region a net importer of undergraduates. Collectively and individually, their economic impact in the city regional economy is significant with collective turnover in excess of GBP 550 million and employment of over 8 000 people

- **Infrastructure is significantly below national and OECD standards**. In 2008 motorway density – measured by kilometres of motorway to its population – was 0.02, less than half the average in UK regions of 0.05 and ten times lower than the OECD average of 0.2. Infrastructure density with respect to land area also lags (see Table 3.14). The region is quite remote from core UK and European markets with the nearest sizeable markets in the Leeds City Region, about 100 miles to the south; Edinburgh, about 120 miles to the north and Manchester City Region about 145 miles to the southwest. The region has experienced a growing demand for air, road and rail travel. The main infrastructure improvements have included the expansion of Newcastle International Airport, with passenger numbers growing from 1.24 million in the 1980s to just short of 4 million today; the development of the Tyne and Wear Metro; and investments to modernise the logistics capacity of the Port of Tyne. Investment in the city region's road infrastructure, in parallel with a permissive land use planning framework and competition between local authorities, has encouraged edge-of-town and out-of-town developments of businesses, housing and retail parks alongside key transport routes. A more strategic approach to infrastructure development could lead to better outcomes for housing market development and the location of production capacity, with benefits for both potential growth and the environment.

- **Innovation activity in the region remains below national standards** with lower overall patent applications (138) than the average of UK regions (505) and the average of OECD TL2 regions (430). The region also had 53.8 patent applications per million inhabitants, lower than the average of UK regions at 90.2 and OECD TL2 regions at 85.6. R&D expenditure as a share of GDP is also significantly lower at 0.83%, around half of the national average of 1.62% and the OECD average of 1.55%. The business sector spends around one-third of what the private sector typically spends in the UK (1.01%) and in OECD TL2 regions (0.93%). Public sector expenditure in R&D is practically non-existent in the region. Despite this, the TWCR has made progress in this area, enjoying a strong growth in employment in knowledge-based industries (KBI). In 2008 43% of employment was in KBIs, with a strong public-sector presence; only 16.4% of KBI jobs were in the private sector, one of the lowest shares of all city regions.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009). Figure 3.26 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region has below average levels in infrastructure density and a lower level of highly-skilled workers. The two elements are critical drivers of growth. The region also has significant gaps in innovation intensity, both in terms of outputs and inputs or expenditures.

Figure 3.26. **How drivers of growth compare to the national average, North East (Tyne and Wear), 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of both the TWCR and the wider North East region.

- **The regeneration in the city region** has brought important economic benefits. In particular the transformation of Newcastle's city centre has encouraged economic development, inward investment and business development activities, and the development of supporting infrastructure including that linked to cultural assets, research and innovation, and enterprise development. Regeneration projects have been financed by national and European funds and state aid to support regeneration. The key projects include the Sage (opened 2004), the Baltic (opened 2002), the Millennium Bridge (opened 2002), Newcastle Quayside, and regeneration of former coalfield, shipyard and port sites in Tyne and Wear, County Durham and Northumberland. Housing developments have also played a key role in the regeneration of former industrial and coal-mining areas in many parts of the city region including South Tyneside, County Durham and Northumberland. The former government's Housing Market Renewal (HMR) programme has also played a key role in supporting regeneration in poorer housing quality areas, for example the Bridging Newcastle-Gateshead Initiative, which focuses on the renewal of established inner urban housing areas.

- **Diversification of traditional sectors** with the emergence of new sectors bringing jobs in creative and digital employment. The greatest concentration of mixed employment is in Newcastle city centre, Newcastle Quayside, and the Gateshead Quays and town centre, leading to increased employment in higher-skilled occupations although employment is concentrated at the lower end of that category.

- **Strong higher educational programmes and institutions** have contributed to improving the proportion of highly skilled workers in the workforce. The combination of two high-status, research-intensive institutions in Durham and Newcastle, with two innovative municipal universities, Northumbria and Sunderland, has enabled the city region to develop a good record of attracting graduates into the labour force. Its comparatively strong graduate retention rate, however, does not mean it is able to offer a broad range of high-level career development prospects for degree-educated residents. Many graduates take jobs for which they are over qualified and two-thirds of those who remained in Tyne and Wear in the latest year for which records are available (2007-08) took up jobs in the public sector.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.14).

- **A relatively weak private sector** means the city region has relied excessively on public sector activity and employment. The city region has a comparatively small private sector with 313 active enterprises per 10 000 working age population, against 537 for the UK as a whole, while the public sector employs around one-third of the region's workforce and contributes 23% of GVA. Public sector activities have been increasing rather than declining over the past years, the second largest employment increase after the financial and business service sector. Low levels of private sector activity and investments can be important bottlenecks for dynamism and innovation-related activities, and has exposed the city region economy during the recession. There is certainly potential to further lift the role of the private sector in key sectors such as financial, professional and business services; creative and digital; tourism; and niche/advanced manufacturing, and there has been a focus on new and emerging market opportunities linked to the development of the low carbon economy, new and renewable energy (such as off-shore wind, electric and ultra low carbon vehicles) and health care and lifestyle technologies. The extent to which these are realised in the current economic environment will be important to the future of growth in the city region.

- **Fragmented internal markets and inadequate internal connections** mean the region has insufficient critical mass to generate agglomeration benefit and spillover effects. Internal governance is not yet strong enough to provide leadership in this area. The city region needs a strong focus on its internal infrastructure including its public transport system and housing supply to improve internal connectivity and develop a stronger and better-connected economy. The region faces significant congestion during peak times, despite having one of the lowest levels of car ownership of the city regions in the north of England. Rail commuters in the morning peak face increasingly overcrowded trains, from Durham and Sunderland into Newcastle and between Newcastle and the south of the city region. The region's bipolar nature represents an important barrier to agglomeration benefits. There is also a need to continue to focus on key strategic connections, in particular to the south and internationally, although the city region needs to boost its performance to manage the risks of leakage which may accrue from stronger external connectivity.

- **Inability to mobilise its potential workforce**. The city region's traditional industrial base and subsequent loss in competitiveness brought a period of structural change, leaving many people out of work and dependent on social protection schemes. A large number of inhabitants are currently still under such schemes, representing a loss of potential in the region's workforce. The city region has not been able to engage this important segment of its workforce with other economic activities. This has contributed to a culture of dependency, an obstacle to generating a dynamic environment and fomenting entrepreneurial spirit and competitiveness.

- **Lack of continuity in governance and policy.** The institutional instability in the UK has been particularly problematic for the city region due to a relative lack of bottom-up initiatives among its own stakeholders which might have provided stability and policy co-ordination.

Table 3.14. **Statistical summary, North East (Tyne and Wear)**

	Period	North East	United Kingdom	OECD	National gap	OECD gap
Levels						
GDP pc	1995	18 533	22 336	18 926	83%	98%
	2007	23 281	30 145	24 597	77%	95%
GDP	2007	59 715	1 296 729			
GDP share	1995	3.26%	n.a.			
productivity	1995	47 028	47 130	44 513	100%	106%
	2007	51 461	59 779	54 713	86%	94%
Area (in km^2)		8 573	243 069			
Area share of national		3.53%				
Population	2007	2 560 100	60 781 334	3 481 456		
Population share	2007	4.21%	n.a.	n.a.		
Population density	2007	301	250	263		
Elderly dependency ratio	2007	25%	21%	21%		
Youth dependency ratio	2007	26%	27%	28%		
Motorway density (p)	2007	0.02	0.05	0.20		
Motorway density (a)	2008	6.77	13.67	21.91		
Primary attainment % LF	2008	22.5%	22.0%	27.4%		
Tertiary attainment % LF	2008	29.2%	34.6%	26.0%		
Unemployment rate	2008	7.6	5.7	6.3	1.90	1.3
Employment rate	2007	68.5	71.5	66.7	-3.05	1.8
Long-term unemployment	2008	1.83	1.4	2.4	0.45	-0.5
Youth unemployment	2008	18.28	14.9	15.3	3.35	2.9
Patent applications	2007	138.11	505.2	430.0		
Patents per million	2007	53.8	90.2	85.6		
R&D to GDP	2005	0.83%	1.62%	1.55%		
BERD to GDP	2005	0.37%	1.01%	0.93%		
GERD to GDP	2005	0.00%	0.16%	0.25%		
Changes						
GDP pc growth	1995-2007	1.92%	2.53%	2.2%		
GDP growth	1995-2007	1.86%	2.92%	2.8%		
Productivity growth	1995-2007	0.75%	2.00%	1.83%		
population growth	1995-2007	-0.07%	0.35%	0.6%		
WA population growth	1995-2008	0.13%	0.60%	0.8%		
Elderly dependency (pp change)	1995-2007	0.91	-0.03	2.50		
Youth dependency (pp change)	1995-2007	-4.78	-0.04	-6.28		
Primary education (pp change)	1999-2008	6.56	6.18	-6.09		
Tertiary education (pp change)	1999-2008	4.58	5.29	5.84		
Employment rate (pp change)	1999-2007	7.29	2.33	1.87		
Unemployment rate (pp change)	1999-2008	-2.41	-0.69	-1.82		
Patents per million (pp change)	1995-2007	12.96	41.12	53.29		
R&D to GDP (pp change)	1995-2005	-0.39	-0.15	0.13		

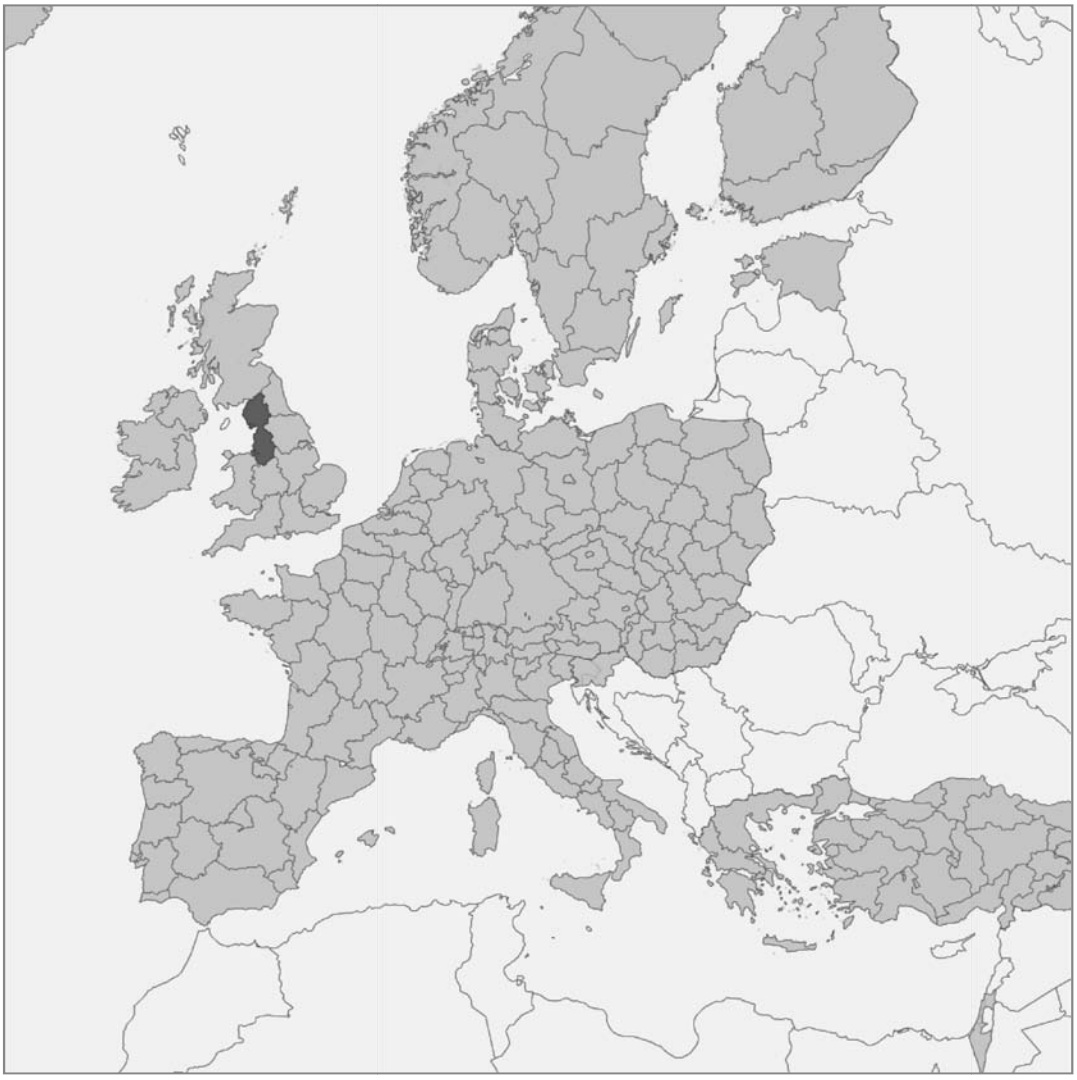
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

North West (Manchester), United Kingdom

Figure 3.27. **North West (Manchester), United Kingdom**

Regional category: Catching-up potential and growing below the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

This case study concentrates particularly on the functional city region of Greater Manchester (GM), given the focus on this level for regional policy making in the UK since the election of the current government and the abolition of the administrative regional tier. In the case of Greater Manchester, this represents continuity with existing arrangements (see discussion below). The population of the North West was 6.9 million in 2007, or around 11.2% of the UK population. Its total GDP totalled USD 175 414 million in PPP terms in 2007, around 11% of the national total. The North West region is made up of 13 TL3 regions.

Greater Manchester includes the cities of Manchester and Salford, plus the adjoining metropolitan boroughs of Stockport, Tameside and Trafford (GM South) and of Bolton, Bury, Oldham, Rochdale and Wigan (GM North). The functional city region extends wider and also includes parts of the districts of High Peak, Congleton, Macclesfield, Vale Royal and Warrington, although these districts are not formally represented within the GM governance arrangements. This city region has 3 million inhabitants, 47% of the population in the region. It contributes 50% of the region's total GDP, with GM itself contributing 39% (Manchester Independent Economic Review, 2008). The city region is one of the largest functional economic regions in the United Kingdom, and is the economic engine of the TL2 region and much of the wider territory.

There has been considerable institutional instability in the UK, with the recent abolition of the Regional Development Agencies which operated at TL2 level, and the creation of Local Enterprise Partnerships (LEPs) to work at the level of the "functional economy". Whilst competencies for LEPs are still being determined as the new arrangements evolve, the geography of the Greater Manchester LEP builds on the collaborative structures established by GM local authorities through the Association of Greater Manchester Authorities (AGMA) in 1986, following the dissolution of the statutory Greater Manchester Council. Members of the AGMA have worked collaboratively on economic and infrastructure development since its formation. In April 2011 the local authorities in GM entered a new phase of collaboration by voluntarily creating a new statutory body covering the 10 districts, the GM Combined Authority.

Two important economic shocks have influenced the city region and its productive base in recent years. First an ongoing economic restructuring, which was most intense during the 1980s and the early 1990s and caused the demise of large-scale manufacturing and a mass loss of employment with a profound impact, particularly in northern parts of the area. In addition, the bombing of the city centre in 1996 caused considerable damage to the physical infrastructure of the centre, triggering a large-scale development plan aimed at regenerating and repopulating the city centre, with a series of investments developing the city as a centre for financial and professional services and national retail brands. These investments enhanced the public transport infrastructure, built and refurbished iconic buildings and fostered new city centre housing and accommodation.

Policy co-ordination remains an issue in the UK. For example, one of the key issues facing GM is employment within the city region and co-ordination in this area is important. However, leadership in this area is fragmented. Employment policy remains substantially driven by national government programmes; for example, programmes providing benefits to inactive and incapacitated workers are administered through central government agencies whilst skills policy has shifted from national to regional levels over different cycles of governance. At the same time, local authorities and Regional Development Agencies have been able to access European-level programmes such as ERDF and ESF to seek to address employment issues and many local authorities have created local employment schemes using decentralised regeneration and development funding. Employment-related interventions in transport and housing are the responsibility of other parts of central government. Similar issues have persisted in other fields of policy.

Overall, the UK experiences problems with overlapping and fragmented programmes making the systems of governance highly complex and difficult to co-ordinate. Indeed, there remains inconsistency in the underpinning objectives within central government departments between those who promote location-based development strategies and those who are largely spatially blind.

Economic assessment

The taxonomy classifies the North West as a region with catching-up potential, growing below the national average. In 1995 its GDP *per capita* was USD 20 161 in PPP, around 10% lower than the national average. Over the period 1995-2007, GDP *per capita* grew at a rate of 2%, around the pace of growth in the OECD TL2 regions of 2.1%, but trailing behind the national average of 2.53%. Consequently the gap in GDP *per capita* widened over this period to 15% below the national average. Although the North West trails behind national levels of growth the economic performance of the region is quite dynamic, with the city region the most dynamic part, generating almost 50% of overall output (Manchester Independent Economic Review, 2008). Even so the annual GVA growth rates between 1999 and 2004 were 2.4% in the city region and 2.5% for Greater Manchester (2.5%), lower than the UK figure of 2.9%, even when London is excluded.

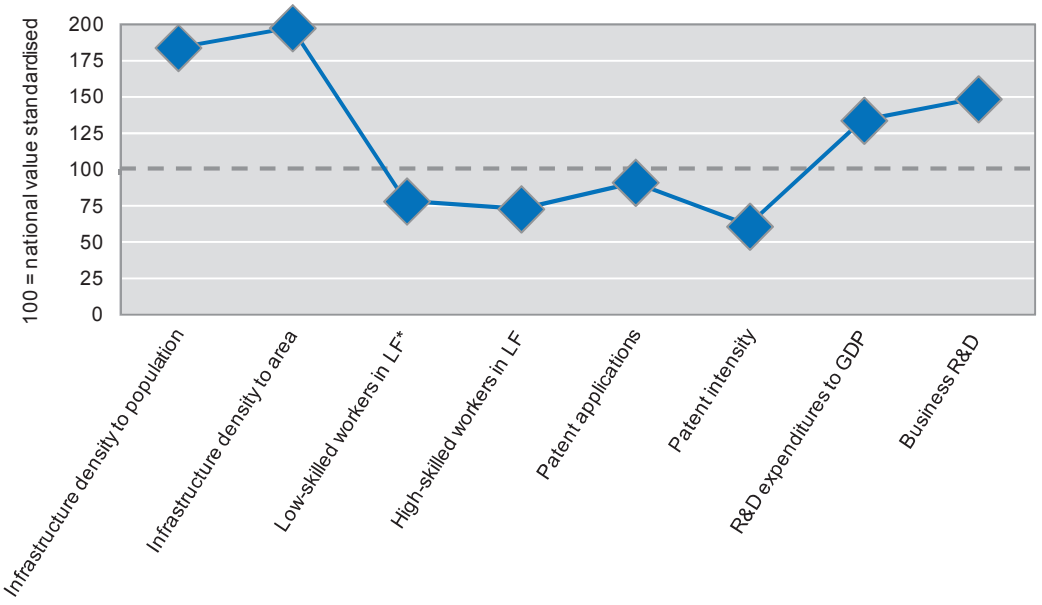
Below we summarise how the North West performs compared to national and OECD averages for a number of key indicators. Figure 3.28 summarises its performance against the national average.

- **Productivity is lagging.** In 1995, productivity – measured by GDP per employee – stood at USD 46 302 in PPP in the North West, just 4% below the national average. By 2007, the gap had widened to 12% below the national average leaving productivity at USD 62 926 in PPP. The residents of the city region also show lower productivity levels than the national average, with a GVA *per capita* of GBP 15 800[20] in 2004 compared to a UK figure of GBP 16 700 although if London is excluded the national figure is lower at GBP 15 500. Workforce productivity in Greater Manchester, expressed as GVA per employee, currently stands at GBP 30 600, which falls some way behind the UK average of GBP 32 800, but is again closer to the UK average excluding Greater London (GBP 31 200).
  - This widening of the gap is due to the profound structural change in the city region, with activity shifting from a declining manufacturing sector in the northern part to an up-and-coming services sector in the south. GVA and job growth in the city region has been driven by a number of key industry sectors that have helped GM develop as a major centre of knowledge-intensive industries. These include sectors such as financial and professional services, life sciences, ICT and digital communications, and creative, digital and new media, as well as established sectors such as logistics and construction.
- **Labour market performance in the North West slightly trails the national average** with unemployment rates of 6.7% and youth unemployment rates of 17.4% in 2007, around 1 and 2.5 percentage points above the national average respectively. Long-term unemployment is also slightly higher, at 0.5 pp above the national rate, and the employment rate of 69.9% is slightly below the national average of 71.5%. Over the period 1995-2008 the increase in employment rates was 2.91 percentage points, higher than the national average of 2.33 pp. The city region enjoyed particularly strong growth between 1999 and 2004, represented by a net increase in employment of 75 900 jobs over the period, driven primarily by traded service sector jobs. Within the city region, 64% of the population are of working age, 71% of whom are either in employment or self-employed. Unemployment in Greater Manchester, represented by the number of claimants of out-of-work benefits, stood at 2.8% of the working age population in 2008, marginally above the UK rate of 2.5%, but below the 3.0% recorded for the North West as a whole (UK Office for National Statistics, 2008a). There are, however, significant differences within GM (see below).
- **There is room for improvement in human capital.** Low-skilled workers – those with only primary education attainments – make up 22.8% of the workforce in the North West, a slightly higher share than the remaining UK TL2 regions (22%). The share of highly skilled workers is 32.8%, lower than the average of the remaining regions.

- **Innovation activity is mixed**. On the one hand the region recorded 67.5 patent applications per million inhabitants, below the national average of 90.2. On the other hand, business expenditure in R&D as a percentage of GDP is higher at 1.54% than the national average of 1.01%.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a, 2009b). Figure 3.28 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region has adequate infrastructure, but suffers from both lower levels of highly-skilled workers than nationally and higher levels of low-skilled workers in its workforce. Above average levels of R&D expenditure has resulted in lower levels of innovation.

Figure 3.28. **How drivers of growth compare to the national average, North West (Manchester), 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of the region:

- **Coherence and continuity in governance**. At a time of when UK economic governance has been characterised by both centralisation and continuing change, since the early 1980s there has been a spirit of co-operation among the 10 local authorities that make up Greater Manchester, bringing some long-term coherence to their strategic planning and policy design, and providing a magnet for investment by avoiding policy fragmentation and competition among them.

- **Capital deepening**. Investments in physical capital in the city centre have made the GM city region much more attractive to inward investment, supporting private business activity, growth and development. Over 50% of the North West's Top 500 companies now operate within the city region. The Cushman & Wakefield UK Cities Monitor (Cushman and Wakefield, 2008) ranks Manchester as the 2nd city in the UK for office space, and the top city to locate new headquarters.
- **Good supply of highly skilled workers**. The city region has significant higher education and innovation capacity, including three key universities hosting 200 000 students per year, generating economic activity in the city region, with students spending around GBP 1 billion per year and providing a diversified pool of highly skilled workers**.** Due to an excess of supply over demand, the city region typically loses a proportion of its skilled graduates to London and the southern regions of the UK. The universities have played important roles in spurring innovation in the emerging knowledge-intensive industries in and around the university corridor, in particular in the bio-technology and multimedia sectors.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.15).

- **Mismatch in skills between demand and supply** during the restructuring process. The decline in the industrial sector and emergence of jobs in financial and business services caused a mismatch as existing workers were unable to adjust their skills and meet the changing demands in the region. As a result many people from the city region have been left out of Greater Manchester's economic development, and been unable to compete with the newer workers coming in with different skills, or from other areas. This has led to social fragmentation with increasing wage disparities between residents based in the better-performing parts of the city region or working in the more productive sectors, and those in the less productive industries or resident in isolated and deprived communities.
- **A fragmented labour market area due to poor connectivity** within the functional city region. The restructuring process created a geographic divide between the north, home to the manufacturing base and many of the deprived communities, and the centre and the south, which have been successful in attracting new business and service activities and benefitting from regeneration investment. The restructuring process requires a flexible transport network capable of moving workers from north to the south. Internal connectivity has continued to be a barrier, despite the effective tram system, and the city region has experienced problems of inaccessibility and congestion. The bus network has proven a particular problem since deregulation, with different ticketing and fares systems impeding attempts to generate an integrated system. Proposals to introduce congestion charging to manage traffic growth and generate funds for investment in public transport were rejected in a local referendum in 2008.
- **Too many programmes too thinly spread**. An array of programmes and policy interventions into GM from the European level, the national level, the regional level and the local level have been too thinly spread and have lacked shared strategic goals, adequate co-ordination and coherence. Integrating some of these and improving their quality could have brought more effective development in the city region; the Greater Manchester strategy agreed in 2009 aims to provide a stronger alignment of interventions from different levels in the future. The strategy covers a range of areas from economic development, enterprise and innovation through to spatial planning, employment and infrastructure.

Table 3.15. **Statistical summary, North West (Manchester)**

	Period	North West	United Kingdom	OECD	National gap	OECD gap
Levels						
GDP pc	1995	20 161	22 336	18 926	90%	107%
	2007	25 554	30 145	24 597	85%	104%
GDP	2007	175 414	1 296 729			
GDP share	1995	9.57%	n.a.			
productivity	1995	46 302	47 130	44 513	98%	104%
	2007	55 423	59 779	54 713	93%	101%
Area (in km^2)		14 106	243 069			
Area share of national		5.80%				
Population	2007	6 858 700	60 781 334	3 481 456		
Population share	2007	11.28%	n.a	n.a		
Population density	2007	484	250	263		
Elderly dependency ratio	2007	25%	21%	21%		
Youth dependency ratio	2007	27%	27%	28%		
Motorway density (p)	2007	0.09	0.05	0.20		
Motorway density (a)	2008	45.17	13.67	21.91		
Primary attainment % LF	2008	22.8%	22.0%	27.4%		
Tertiary attainment % LF	2008	32.8%	34.6%	26.0%		
Unemployment rate	2008	6.7	5.7	6.3	1.03	0.4
Employment rate	2007	69.9	71.5	66.7	-1.60	3.2
Long-term unemployment	2008	1.93	1.4	2.4	0.55	-0.4
Youth unemployment	2008	17.41	14.9	15.3	2.48	2.1
Patent applications	2007	463.12	505.2	430.0		
Patents per million	2007	67.5	90.2	85.6		
R&D to GDP	2005	2.00%	1.62%	1.55%		
BERD to GDP	2005	1.54%	1.01%	0.93%		
GERD to GDP	2005	0.07%	0.16%	0.25%		
Changes						
GDP pc growth	1995-2007	1.99%	2.53%	2.2%		
GDP growth	1995-2007	2.04%	2.92%	2.8%		
Productivity growth	1995-2007	1.51%	2.00%	1.83%		
Population growth	1995-2007	0.04%	0.35%	0.6%		
WA population growth	1995-2008	0.28%	0.60%	0.8%		
Elderly dependency (pp change)	1995-2007	-0.15	-0.03	2.50		
Youth dependency (pp change)	1995-2007	-4.42	-0.04	-6.28		
Primary education (pp change)	1999-2008	7.90	6.18	-6.09		
Tertiary education (pp change)	1999-2008	4.61	5.29	5.84		
Employment rate (pp change)	1999-2007	2.91	2.33	1.87		
Unemployment rate (pp change)	1999-2008	0.54	-0.69	-1.82		
Patents per million (pp change)	1995-2007	15.47	41.12	53.29		
R&D to GDP (pp change)	1995-2005	0.20	-0.15	0.13		

Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Podlaskie, Poland

Figure 3.29. **Podlaskie, Poland**

Regional category: Catching-up potential and growing below the national average

Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Podlaskie encompasses three smaller TL3 regions (sub-regions at NUTS 3 level): Białostocki, Łomzyński, and Suwalski. The region was home to 1.2 million people in 2007, 3.1% of the Polish population, with a population density of 60 people per km^2 compared to the Polish average of 122. Around one-fourth (26.7%) of its area is protected under NATURA 2000, a greater proportion than the Polish share as a whole (17.6%). The largest cities in the region are Bialystok, with

300 000 inhabitants, Suwalki with 69 000 and Lomza with 63 000 inhabitants. Geographically, the region is quite peripheral to the core European and Polish markets, being located in the northeast of Poland bordering with Belarus in the east and Lithuania in the northeast. Its neighbouring regions are Warminsko-Mazurskie to the northwest, Mazowieckie in the west and Lubelskie in the south, which all have lower GDP *per capita* than the national average. About half (49%) of the population live in rural communities. Settlement patterns are quite monocentric, concentrated around the central city of Bialystock.

The Podlaskie voivodship experienced two major shocks to its economy in the past two decades. First, the transition from a closed communist economy to a fully open market economy combined with the closing of its eastern border with Belarus in 1999 caused a collapse in the region's production due to the closing down of large state-owned enterprises. Then, Poland's accession to the EU in 2004 left the region on the periphery of core European markets while further shutting down the region's commercial ties to its eastern non-EU member countries. Membership of the EU also brought important institutional reforms establishing the Podlaskie voivodship in the place of the former Białostockie, Suwalskie and Łomzyńskie ones.

Poland is a unitary state with three tiers of sub-national government. The top tier consists of 16 regions (*województwa*), the second 379 counties (*powiaty*) and the third 2 478 municipalities (*gminy*). In 2006, 30.7% of all spending was devolved, while the regions and below accounted for 18.9% of total revenue. Poland has gradually decentralised since 1990. A series of administrative reforms since 1999 have resulted in the assignment of a number of specific responsibilities to regional authorities.

Central government is represented in the region by *wojewoda,* while the regional government is headed by a *marszalek*, who is responsible for planning and managing the region's development together with the regional assembly, or *sejmik wojewodzki.* The regional government's key tasks and responsibilities consist of: *i*) formulating a strategic vision of regional development and developing plans based upon it, and *ii*) creating active policies of regional development. The regional government often has to co-operate with other government bodies as well as with other institutions and organisations. It should undertake initiatives to stimulate economic development, improve the competitiveness and innovativeness of the regional economy, maintain its cultural and natural assets, maintain spatial order and harmony, maintain and plan expansion of social and technical infrastructure at the regional level, and provide regional public services. To these ends it formulates policies covering social development (human and social capital), development of social and technical infrastructure, financial measures needed to carry out specific tasks, use of natural resources in accordance with the principles of sustainable development, facilitation of collaboration between research institutions and businesses to promote technological progress and innovation, development of culture and the protection and rational use of cultural heritage.

The regional government is responsible for science and education (some post-secondary and secondary education, teachers, training centres, regional libraries); regional roads and public transport (road network development planning, acting as an investor and maintaining roads and traffic engineering devices); health care (specialised facilities, some health spas); social assistance (development and implementation of social assistance programs, vocational training of social assistance

institutions staff); culture and national heritage protection (supporting cultural institute), environmental protection and water management (including flood protection and setting fees for waste disposal) and recreational and physical education. It is also responsible for land-use planning through regional planning offices responsible for formulating and implementing the region's spatial policy. Spatial development policy goals include rational zoning, improving those areas where development problems are concentrated, and modernising rural areas.

Economic assessment

The taxonomy classifies Podlaskie as region with a catching-up potential and growing below the national average. In 1995 GDP *per capita* was USD 6 213 PPP, approximately 23% below the Polish average and around 67% below the OECD average for TL2 regions. Over the period 1995-2007, its GDP *per capita* grew by 4.38% annually on average, slightly below the national rate of growth of 4.72% and significantly above the OECD TL2 regions growth rate of 2.2%. Consequently the GDP gap nationally increased to 26% over this period while the gap with respect to the OECD closed to just 58% below the average. Population in the region declined by 0.18%, from 1.22 million in 1995 to 1.19 million in 2008, more rapidly than the decline in Poland as a whole (0.10%), at a time when the OECD population increased by 0.6 percentage points. GDP growth overall was 4.2%, below the national pace of growth of 4.6% but well over the average pace of growth in OECD TL2 regions at 2.8%. This means that part of the convergence with OECD GDP levels *per capita* is driven by population decline.

Below we summarise how Podlaskie performs compared to national and OECD averages for five key indicators. Figure 3.30 summarises this performance against the national average

- **Productivity is falling further behind national levels** but catching up with the OECD. Productivity – measured by GDP per employee – stood at USD 18 958 in PPP in 1995, 4% below the national average, and significantly below the average productivity in OECD regions of USD 44 513 per employee. Between 1998 and 2007, productivity in the region grew by 4.14%, more than two percentage points below the average productivity growth in Poland (6.63%), but well above the OECD TL2 regions growth of 1.83%. Consequently its productivity gap with respect to the rest of the country increased significantly to 22% but it closed its productivity gap with the OECD to 50% from 57%. As in other Polish regions, productivity gains in Podlaskie have been partly driven by a contracting workforce. The region experienced 29 700 net job losses during 1999-2007. This suggests the region is still undergoing a profound structural change as it modernises its traditional sectors.
    - Agriculture still plays an important role, employing 32% of the workforce, but its share has declined in recent years while maintaining its GVA share of total production, suggesting agricultural productivity has increased. Its agricultural productivity ratio remains the lowest of all the regions in Poland, suggesting there is room for significant further modernisation. The food industry has consolidated from 215 firms employing more than 9 people each in 2000 to only 185 in 2008. Among other things, this has

been due to the need to meet quality standards which require considerable financial outlays.

  - Other important industrial sectors include the wood-working and furniture industry, the manufacture of rubber and plastic products and machinery and equipment. Construction and the public sector are also significant employers. There are currently no big industrial centres in the region. The main clusters in the region include the Food Industry Cluster, Metalworking Cluster, Podlachia Lingerie Cluster, Polish Yachts Cluster Foundation, Polish Eastern Medical Cluster, Digital Education Cluster, and other smaller initiatives in tourism, food, and the wood and furniture industry.

- **The strong labour market outcomes may have been driven by a reduction of the workforce**. Before the global financial crisis in 2008 the region had lower overall, youth and long-term unemployment rates, at 6.4%, 15.42% and 2.4% respectively, than the national average (7.3%, 17.7% and 2.5% respectively). Podlaskie's rates were around the OECD average for 2008. Employment rates in the region, at 59.9%, are above the national average of 57.7%, but significantly below the OECD average of 66.7%. Employment rates decreased by 3.8 percentage points (pp) over the period from 1999 to 2008 at a time when Poland as a whole experienced an increase which, along with the fact that the region has suffered significant population decline, suggests that the good labour market performance may have been driven by a reduction of its workforce.

- **Human capital in the region is adequate** although challenges remain. Highly skilled workers – those with tertiary educational qualifications – make up 23% of the region's labour force, a similar share to the Polish average and only three percentage points below the OECD average. Podlaskie has a higher share of low-skilled workers, 13.6% compared to the national share of 9%, although this proportion is lower than the OECD TL2 region average. The proportion of highly skilled workers is driven by the larger number of universities including the University of Białystok, Białystok University of Technology, and numerous private colleges and universities. The region appears to have a surplus of humanities graduates. The proportion of graduates of vocational schools is only 9.2%, one of the lowest rates in the country. The region also allocates substantial resources from local, state and EU funds to promote life-long learning. Education spending formed among the highest share of local government unit budgets.

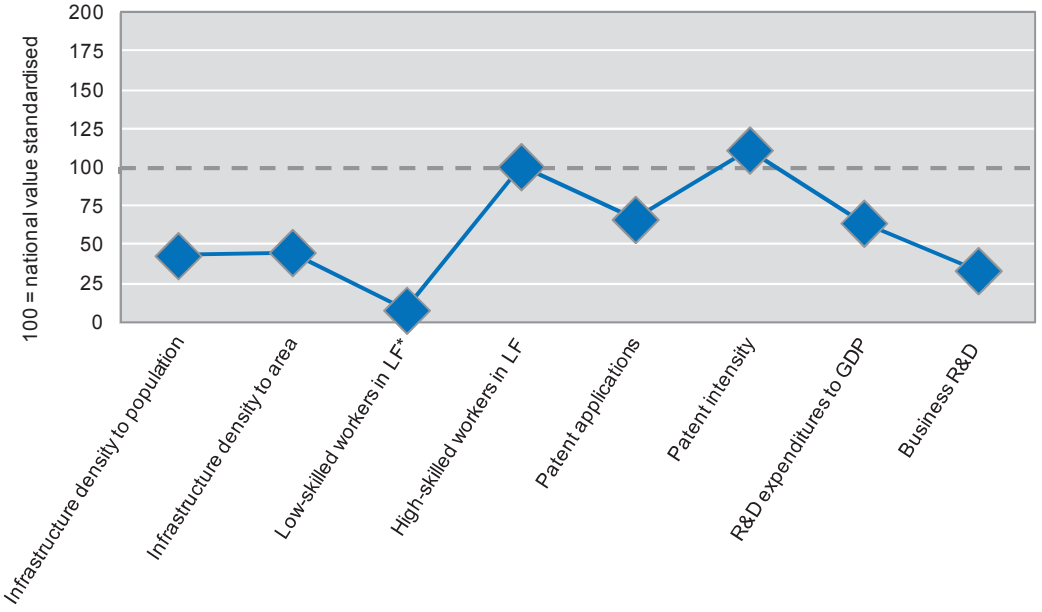
- **Transport infrastructure is inadequate**, significantly below national and OECD standards. In 2008, there were no motorways, defined as two-lane motorways, within the entire region and the internal roads were low quality. The region also lacks high-speed rail and a regional airport. Planned improvements include finishing the construction of Warszawa-Białystok motorway by 2012, and the international airport (built by the motorway) by 2015. The region's infrastructure deficiency is due to the local government's limited financial resources and the region's low capacity to attract investment as well as regulations on environmental protection.

- **Innovation activity is low.** Only 3 patent applications were recorded in 2007 compared to an average of 6.7 for Polish regions and 430 for all OECD TL2 regions. Patent intensity, in relation to the region's population stood at 2.5 patents

per million inhabitants, slightly above the national average of 2.3 but significantly below the OECD average of 85.6. R&D expenditure formed 0.27% of GDP, below Polish average of 0.40% and significantly below the OECD TL2 regional average of 1.55%. Business R&D expenditure as a proportion of GDP is one-third of the national average and less than one-tenth the typical involvement of the private sector in OECD TL2 regions. On the other hand, business R&D expenditure does appear to have increased as a proportion of GDP during 2000-05, at a time of national decline. The four main science, technology and industrial parks in the region are the Science and Technology Park Poland-East in Suwałki, the Białystok Science and Technology Park, the Podlaskie Industrial Park in Czarna Białostocka and the Industrial Park in Zambrów. Most innovation in the region is carried in medium- to low-tech sectors. Forging links between business parks with educational facilities and small- and medium-sized enterprises will be key to improving innovation intensity in the region as well as improving co-operation between universities and businesses.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended side-effects stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.30 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region is especially weak in infrastructure, and suffers from an excess of low-skilled workers and low levels of private R&D expenditures.

Figure 3.30. **How drivers of growth compare to the national average, Podlaskie, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of the region.

- **Adjusting its economic activities to the region's strengths and environmental constraints**. Despite the region's need to modernise its agriculture, the food production and processing industry is showing dynamic development. This sector contributes significantly to regional GDP and generates jobs. Employment in companies with over 9 employees totalled 15 077 in 2007, 30% of total employment in industry and 5% of total employment in the region. The dairy industry is of crucial importance to the development of the region and makes use of its regional products in environmental friendly ways. Producers such as Mlekovita, Piątnica or Sokółka are well known in Poland and abroad suggesting activities in this area can be important means for success and not only for survival. Modern agricultural production can be compatible with the region's unique environmental assets.

- **Mobilising endogenous resources**. The Regional Operational Programme and Programme of Development of Eastern Poland have contributed to positive changes in the region. Podlaskie is a part of the so-called "Poland B" in the east, which was historically less developed. Under the planned economy, regional differentiation was limited, because of financial transfers to the poorest regions. Income disparities among the population were rather small, although they were related to the level of development of regional economies. After 1990, there was a significant reduction in the level of central government intervention in regional economies. Before Poland joined the EU, Eastern Poland received less funding than central and western regions. Regional development policy from that time focused on improving technical infrastructure in these parts of Poland that were next to the EU border or linked functionally with EU countries. From 2004-06 Eastern Poland was still getting less funding but in 2007 the system of allocation of EU funds was changed and the mechanism for deciding how to use them decentralised. Regional governments are now key players and decision makers. The Podlaskie region has secured programmes crucial for improving living conditions. The Program of Development of Eastern Poland has also contributed to the mobilisation of endogenous resources. Improving living conditions and the development of tourism infrastructure together will change perceptions of the region.

- **Mobilising the region's natural resources**. Podlaskie has the potential to build on its good experiences so far and develop activities based on its natural resources. The number of tourism-related businesses has increased during the last years. Thanks to its environment and eco-services and agro-tourism initiatives, the region has started to change its image: from a traditional rural to relatively attractive tourist region. Generally its unique resources have come to be seen as an asset and this increasing ecological consciousness together with legal protection of the environment means they are not threatened by industrial production.

- **Enhancing links with Belarus and Lithuania.** Podlaskie is peripheral to the core European markets and faces important constraints on active cross-border commerce with its eastern non-European Union neighbours. Despite these constraints, the region did take advantage of its proximity to eastern markets before accession to the EU. Reactivating co-operation with Belarus and Lithuania may contribute to growth

of the region. There is evidence that despite political challenges, such co-operation is possible and might be much more fruitful in the future. Specific localities and the region as a whole might be seen as "gateways" to the east, although so far this has not been the case. Such a positive change in cross-border relations would depend on national foreign policy initiatives.

- **Adequate higher educational facilities have brought human capital potential.** Although the region is experiencing population decline and outmigration, its human capital potential remains strong. The region has a strong scientific heritage, including the University of Białystok, Białystok University of Technology, numerous private colleges and universities. Even though the region suffers from brain drain with a significant share of its graduates leaving the region in search of jobs, the share of labour force with tertiary qualifications is around the average in the Polish regions. Human capital may contribute more to the region's future performance once it develops and catches up, offering better employment opportunities.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire and the results of our own analysis (summarised in Table 3.16).

- **Inadequate spatial and functional integration.** Podlaskie has a peripheral location in a part of Poland which has historically seen lower levels of both economic and social development. Despite a period of intensive industrialisation of Poland under the communist regime, the region's economy remained strongly dominated by agriculture. Due to its limited development potential (natural and human resources, limited capacity of regional and local markets) the region has not attracted sufficient investment and business activities. This has contributed to the further marginalisation of the region. Podlaskie is also rather disconnected from the national network and not just because of its location or poorly developed transport infrastructure. These are also structural problems related to its economic development base. Relative backwardness has become a stigma, which has had a negative impact on the image of the region.

- **Inadequate infrastructure, especially for transport**. One of the reasons why the region is poorly integrated is its underdeveloped infrastructure, especially for transport. Despite recent investment, the region still lacks an airport, adequate road and rail infrastructure and adequate information communications technology (ICT) infrastructure.

- **Unfavourable geographic location**. The region's location is a bottleneck to growth in many ways. As has already been mentioned, it is right on the periphery of the European Union. Its eastern borders were sealed on accession to the EU, cutting it off from neighbouring countries, such as Belarus. Within Poland it is located next to other lagging regions or lagging parts of other regions; Podlaskie borders the poorest parts of Mazowieckie region. This creates additional barriers to

development and makes it harder to establish functional relationships that could change development paths of the region.

- **Lack of internal cohesion**. Underdeveloped transport and other communication networks is one reason behind the region's lack of territorial cohesion; the other is historical. Podlaskie was established as a result of administrative reform introduced in Poland in 1999 when three former regions, Białostockie, Suwalskie and Łomżyńskie, were merged into one. Two former regional capitals, Lomza and Suwalki, lost their administrative status. The development conditions of parts of Podlaskie are quite different from each other. It has proved hard to co-ordinate the different actors to formulate and implement development policies both horizontally and vertically.

- **Exclusion of large parts of the region from economic activities**. Around 40% of the region's surface area is protected under Natura 2000 rules. Apart from four national parks (Białowieski, Biebrzański, Wigierski, Narwiański) there are also three landscape parks, 85 nature reserves and 2051 natural monuments. There are also plans to extend the area of Białowieski National Park and to establish a new one − Mazurski National Park, which will partially belong to the region. These developments need to be translated into necessary practice of land use. Thus, the level of freedom, when it comes to location of new functions and activities, is very limited. It may have an impact on internal cohesion in the region and development opportunities. It may also determine a spatial and functional structure of the region for the future as well as relationships with neighbouring regions.

- **Insufficient links between educational institutions and local businesses**. The region’s universities and other academic institutions are attractive to students. Białystok is the largest academic centre in Podlaskie and draws students from all over the region. Academic institutions are expected to prepare well-qualified graduates that meet the needs of the regional economy but the profiles of their graduates do not currently match the requirements of the labour market, causing outmigration. Additionally, there are no efforts to combine education, research, and innovation in co-operation with private enterprises. This restricts the region’s ability to make the most of its human capital.

- **Inefficient development policies**. The two instruments supporting economic development, special economic zones and clusters, have proved inefficient or at least less efficient than anticipated for a number of reasons. Their performance provides strong arguments for a revised approach.

- **Co-ordination gaps in multi-level governance**. There are no good examples of multi-level governance practices in the region. Lack of internal cohesions and other problems related to economic development and use of human capital, which have been seen at both regional and sub-regional levels, call for new ways of governance and management. There needs to be more flexible and open approaches to co-operation. Citizens' participation should also be enhanced.

Table 3.16. **Statistical summary, Podlaskie**

	Period	Podlaskie	Poland	OECD	National gap	OECD gap
Levels						
GDP pc	1995	6 213	8 048	18 926	77%	33%
	2007	10 388	14 004	24 597	74%	42%
GDP	2007	12 408	310 628			
GDP share	1995	2.32%	n.a.			
Productivity	1998	18 958	22 534	44 513	84%	43%
	2007	27 324	32 634	54 713	84%	50%
Area (in km^2)		20 187	312 685			
Area share of national		6.46%				
Population	2008	1 192 660	38 115 641	3 481 456		
Population share	2008	3.13%	n.a.	n.a.		
Population density	2008	60	122	263		
Elderly dependency ratio	2008	21%	19%	21%		
Youth dependency ratio	2008	23%	22%	28%		
Motorway density (p)	2008	0.00	0.02	0.20		
Motorway density (a)	2008	0.00	2.45	21.91		
Primary attainment % LF	2008	13.6%	9.3%	27.4%		
Tertiary attainment % LF	2008	23.0%	22.9%	26.0%		
Unemployment rate	2008	6.4	7.3	6.3	-0.90	0.1
Employment rate	2008	59.9	57.7	66.7	2.19	-6.8
Long-term unemployment	2008	2.38	2.5	2.4	-0.11	0.0
Youth unemployment	2008	15.42	17.7	15.3	-2.25	0.1
Patent applications	2007	3.00	6.7	430.0		
Patents per million	2007	2.5	2.3	85.6		
R&D to GDP	2005	0.27%	0.40%	1.55%		
BERD to GDP	2005	0.04%	0.13%	0.93%		
GERD to GDP	.	.	0.15%	0.25%		
Changes						
GDP pc growth	1995-2007	4.38%	4.72%	2.2%		
GDP growth	1995-2007	4.18%	4.62%	2.8%		
Productivity growth	1998-2007	4.14%	4.20%	1.83%		
Population growth	1995-2008	-0.18%	-0.10%	0.6%		
WA population growth	1995-2008	0.54%	0.48%	0.8%		
Elderly dependency (pp change)	1995-2008	2.00	0.02	2.50		
Youth dependency (pp change)	1995-2008	-15.94	-0.14	-6.28		
Primary education (pp change)	1999-2008	-10.87	-7.51	-6.09		
Tertiary education (pp change)	1999-2008	9.67	10.15	5.84		
Employment rate (pp change)	1999-2008	-3.84	1.04	1.87		
Unemployment rate (pp change)	1999-2008	-5.19	-5.71	-1.82		
Patents per million (pp change)	1995-2007	1.69	1.61	53.29		
R&D to GDP (pp change)	2000-2005	0.06	-0.05	0.13		

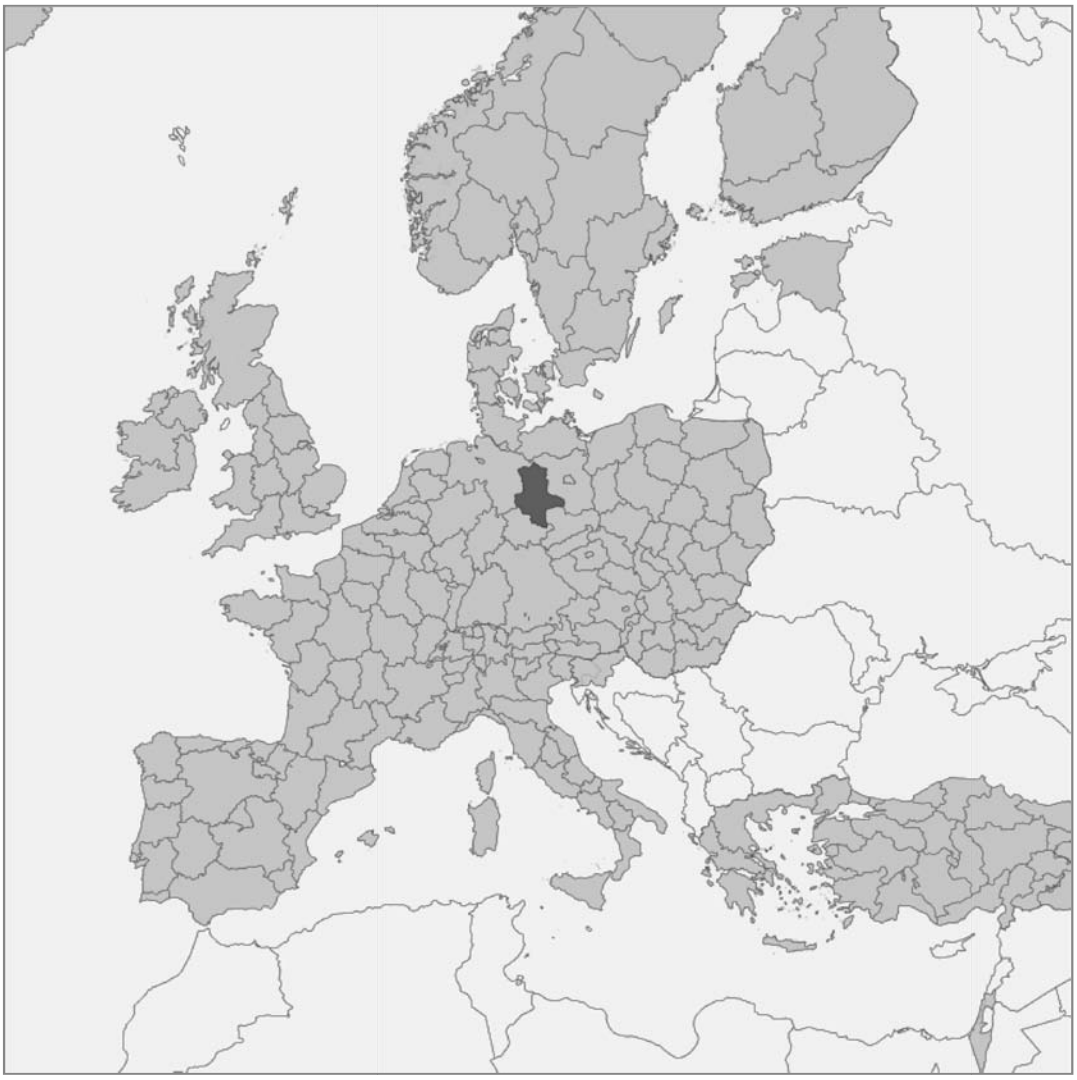
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Sachsen-Anhalt, Germany

Figure 3.31. **Sachsen-Anhalt, Germany**

Regional category: Very large catching-up potential and growing above the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Sachsen-Anhalt encompasses four smaller TL3 regions, Altmark, Magdeburg, Anhalt-Bitterfeld-Wittenberg and Halle. Its population in 2008 was 2.41 million, or 2.9% of the German population. Its population density, at 134 people per km^2, is lower than the German average of (230). The region is located in the central-eastern part of Germany with Brandenburg to the east, Sachsen to the southeast, Thüringen to the south and Niedersachsen to the west. All four neighbouring regions have lower rates of GDP *per capita* than the average of all German regions. The largest cities are Halle, with 232 963 inhabitants, Magdeburg (231 525),

Dessau (86 906) and Wittenberg (49 496). The city structure is dominated by Halle, located in the south of the region, and the capital Magdeburg in the centre, giving Sachsen Anhalt a quite polycentric structure. Just under half, or 44%, of the population live in rural communities, close to the OECD average but almost double the German average of 24%.

Sachsen-Anhalt has experienced two profound economic shocks in recent years. The first was a tremendous structural change with the transition from a closed communist economy to a fully open market economy on 1st July 1990 with the unification of East and West Germany. The open economy was viewed as a cure to the region's economic ills and lower level of development with respect to its western neighbours. However the transition was quite severe due to the closing down of large state-owned enterprises which caused the region's production structure to collapse, leading to a loss of competitiveness and a severe population decline but only modest capital investments. In response to these turbulent changes the region's survival became dependent on transfers and subsidies from the Federal Republic and the European Commission. The second change came with the expansion of the European Union towards the east in 2004, with the new accession countries granting the region a more central location in the EU market.

Germany is a federal state with a three tiers of sub-national government. The top tier consists of 16 federated states (*Länder*) the second tier 323 rural districts (*Landkreise*) and the third tier 12 196 municipalities (*Gemeinden*) and 116 district-free cities (*Kreisfreie Städte*). In 2006, 37.1% of all spending was devolved while states and below accounted for 35.9% of total revenue. According to the German constitution[21] the federal states have wide ranging-legislative competences especially in education, culture, local and police matters. Besides, the state governments are also responsible for the implementation of most federal laws and notably regional economic policy.

From 2002 on, Sachsen Anhalt is trying to decrease the number of people working in the public sector as the region had the highest proportion of public service workers *per capita*. This had contributed to the region having with one of the highest rates of debt *per capita* and had given the region an image problem and reduced investment.

Economic assessment

The taxonomy classifies Sachsen-Anhalt as a region with very large catching-up potential, growing above the national average. In 1995 GDP *per capita* was USD 15 316 in PPP dollars, around 38% below the German average and 19% below the OECD average in TL2 regions. Over the period 1995-2007, its GDP *per capita* grew at a rate of 2.41%, outperforming the national rate of 1.13% and the pace of growth in OECD TL2 regions of 2.2%. Consequently, the gap in GDP *per capita* closed over this period to 28% below the national average and 17% below the OECD average. Population in the region declined over the same period by 11.9%, representing an annual decrease of 1 percent on average, from 2.7 million to 2.4 million at a time when the German population increased annually by 0.05% overall, and in the OECD by 0.6%. GDP overall grew at a rate of 1.35%, above the national rate of 1.19% – although below the OECD TL2 rate of 2.8% – so the region's catching up to national levels of GDP *per capita* is partly but not entirely driven by population decline.

Below we summarise how Sachsen-Anhalt performs compared to national and OECD averages for five key indicators. Figure 3.32 summarises its performance against the national average.

- **Productivity has been increasing.** Productivity – measured as GDP per employee – in 1995 stood at USD 36 923 expressed in PPP, around 37% lower than the national average and 17% lower than the OECD average. From 1995 to 2007, productivity in the region grew at a rate of 1.84%, exceeding the German average rate of (0.35%), and about the same rate as the average productivity growth in OECD TL2 regions (1.83%). Consequently the region closed its productivity gap by 12 full percentage points to just 24% below the national average in 2007. This strong productivity growth reflects an ongoing structural change strengthening the industrial activities in the region since unification. The region has already been an important location for heavy machinery and chemical industry since the 19th century. There has been a process of privatisation, especially in the coal and chemical sectors, as well as considerable FDI investments by firms from West Germany, the EU, the United States and other parts of world and the relocation of western manufacturing focusing on sub-supply and final production. In the 1990s the concentration of heavy industry and chemical production led to high pollution. This resulted in a further period of restructuring towards a much healthier environmental profile.
    - Services employ the largest numbers of people, (55.1% of the workforce), while 41.4% work in industry and construction, and 3.5% in the agricultural sector. By comparison, the national averages are 59.3%, 38.3% and 2.4%, revealing the region's strong focus on industry and construction, which are heavily concentrated in Magdeburg and Halle. The main clusters in the region are in the chemical industry, logistics, life science, biotechnology, automotive engineering, mining, food-processing, tourism and renewable energy. The food industry is quite important due to the region's good soil and is mostly based on local, regional and EU markets. Agriculture represents 2% of the total value added, against 1% for Germany as a whole. The ten largest employers in the region in 2009 are Deutsche Bahn AG (7 685 employees, working in transport), Dow Group Germany (6 600 / chemicals), Deutsche Post AG (5 000 / logistics), EDEKA Märkte (4 141 / retail), Walter Services Holding GmbH (2 436 / services); MIBRAG Mitteldeutsche (2 155 / coal mining) K+S Kali GmbH (2 067 / mining), AKT AG (1 900 / plastics), Mitteldeutsches Druck- und Verlagshaus (1 895 / printing) and Q-Cells AG (1 707 / energy).
- **Labour market outcomes in the region are inadequate,** trailing national rates of pre-crisis unemployment (14.6% as opposed to the national rate of 9.0% and the OECD rate of 6.3%), higher rates of long-term unemployed (9.26% as opposed to the national rate of 5.0% and the OECD rate of 2.4%) and also higher rates of youth unemployment (18.25% as opposed to the national rate of 12.2% and the OECD rate of 15.3%). Employment rates in the region, at 67.3%, while still trailing below the national rate of 70.2% in 2008 have increased by 9.71 percentage points over the period of 1999-2008, more than the German average of 7.06 percentage points. The rate of employment in the region exceeds the average of OECD TL2 regions.
- **Human capital improvements have been quite weak** particularly in high-skilled labour. Just 6.3% of the region's labour force is low-skilled – defined as those with only primary attainments – compared to 11.1% for Germany as a whole and 27.4% for the OECD TL2 regions. In 2008, the region had a lower share of highly skilled workers, at 25.4%, than the German average of 28.1% and the OECD average of 26%. Improvements over the period of 1999-2008 have mainly consisted of reducing the share of low-skilled workers by 1.7 percentage points, albeit these improvements were lower than the national decline of 3.12 percentage points. More worrisome has been the decrease in the proportion of highly skilled workers by 3.5 percentage points at a time when the proportion increased in Germany

overall by 0.82 percentage points and in the OECD by 5.8 percentage points. These declines in highly skilled workers may well be driven by population declines during the transition period when typically highly skilled workers would leave in search of employment opportunities elsewhere.

  - Sachsen-Anhalt has two universities: the Martin-Luther University in Halle with more than 18 000 students, and the Otto von Guericke University of Magdeburg, which has a technical and scientific orientation. There are also seven universities of applied sciences. A significant part of scientific and research activities is performed in 27 non-university and private research institutions. Helmholtz Centres (HGF), HGF research units, institutes from the Gottfried Wilhelm Leibniz Science Association, Max Planck Institutes and Fraunhofer Institutes as well as federal research institutions, and branch locations of federal research institutions complement university research.

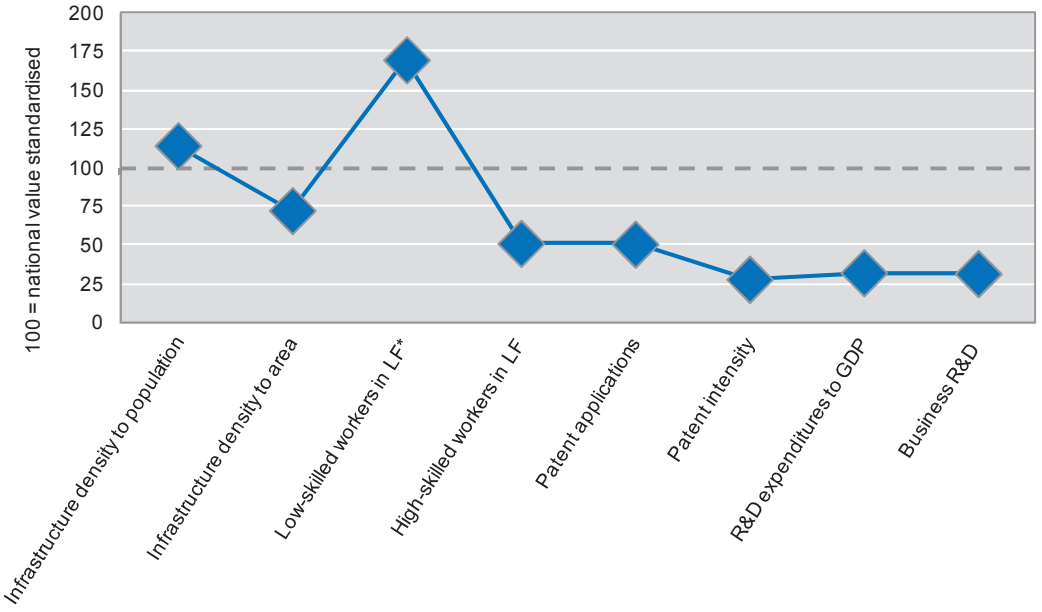
- **Infrastructure has improved significantly** with higher motorway density – measured by kilometres of motorway to its population – than the average of Germany regions (0.17 compared to 0.15) although slightly below the average value in OECD regions of 0.20. Motorway density with respect to the region's land area was 19.91, below the national average of 35.40 and the OECD average of 26. Since reunification, improving transport infrastructure has been one of the most important public investment projects in the region with the "German Unity Transport Projects" (VDE)[22] playing a critical role. The VDE is a nationally based project supplemented regionally by specific infrastructure schemes. Among other things, it has brought to the region the planning and realisation of the expansion of road networks between the east and the west, especially to Berlin; the airport in Leipzig providing the region with good connections to Frankfurt, European and US markets; and a large number of railways, pipelines sewage plants and waterways. The combination of initial infrastructure investment and gradual population decline has brought about the problem of excess infrastructure capacity in places. Current initiatives aim to reduce some capacity, demolishing buildings, creating green spaces and creating denser residential areas.

- **Innovation activity remains below national levels.** The region has fewer overall patent applicants, at 108.9, than the German average of 1139.1 or the OECD average of 430 (Table 3.17). Patent intensity in relation to population is also significantly lower at 44.9, less than one-third the national average of 164.3 and half the OECD average of 85.6. R&D expenditure as a proportion of GDP is also lower at 1.13% than the national rate of 2.08% and the OECD average of 1.55%. The share of business R&D to GDP is 0.33%, compared to 1.21% for the private sector in Germany as a whole and 0.93% in OECD TL2 regions. Public sector R&D expenditure stands at 0.39% of GDP, slightly lower than the national share (0.43%) but more than the typical public sector share in OECD regions (0.25%). An important factor behind the region's low rates of innovation has been the non-relocation of firm headquarters to the region despite the large number of western industries relocating to the region. Firms have mainly relocated factories carrying out sub-supply and final production and not the headquarters where the bulk of R&D innovation typically occurs. The region attracted many vocational workers in comparison to few engineers.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for regional growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009). Figure 3.32 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region has high levels of infrastructure in relation to the population and low proportions of low-skilled workers

in its labour force. The region faces important gaps in the share of highly skilled human capital and innovation intensity.

Figure 3.32. **How drivers of growth compare to the national average, Sachsen-Anhalt, 2008**



Note: *Higher value means the region has less low skilled workers in its labour force (LF), values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of the region.

- **The strong presence of industry and industrial related activities** has been an important driver in the region, the result of an initial process of privatisation of the coal and chemical sectors after reunification; the relocation of new industries from Western Germany, the EU, the US and other parts of the world; high FDI investments and the heritage of strong industrial base from the former DDR. All these elements provided the region with a strong industry based on heavy machinery, heavy manufacturing, refinery and especially chemistry. The region now has a number of modern chemical parks which offer good synergies and co-operative initiatives among the various firms in the park and a common voice to talk to global players and investors.
- **Favourable geographic location and proximity to core European markets**. After reunification and the expansion of EU borders towards the east in 2004, Sachsen-Anhalt now enjoys a central location with respect to core European markets, both western and eastern. This central location has been an important element in attracting FDI capital investments and the relocation of companies.
- **Significant investment flows in the region** brought the European Structural Funds the "Gemeinschaftsaufgabe Verbesserung der regionalen Wirtschaftsstruktur (GRW)"[23] and FDI investments. The European Structural Funds (ESF, ELER, ERDF) have played an important

role in the process of catching up. Since 1991 Sachsen-Anhalt received approximately EUR 10 billion of the European Structural Funds. The GRW in combination with ERDF is one of the most important instruments of regional policy in Sachsen-Anhalt. It has proven to be a flexible but stabilizing instrument of regional policy establishing a self-sustaining and competitive economic structure. In addition Sachsen Anhalt is the largest recipient of foreign direct investments brought by many solar cell and wind turbine manufacturers as well as a surging chemical industry. This important influx of FDI funds has helped the region's economy grow; its manufacturing sector in particular grew by 12.1% in 2006.

- **Significant improvements in infrastructure** have driven the performance of the region, improving its connectivity and accessibility and attracting a large number of logistics companies to the region. Since reunification investments in motorway and road networks have improving the connections between east and west, as well as improving the airport, railway connections, pipelines and waterways. These improvements have allowed the region to take advantage of its central location.
- **A shift from external interventions to internal ones.** The region, like many eastern German regions, received important external subsides after reunification as part of the Solidarity Pact but these are gradually being phased out and due to end completely in few years' time. National transfers, based on population size, are also decreasing as the population declines. Since 2002, the region, which has the highest number of public employees *per capita*, has also taken steps to reduce the size of its public sector by 30%. These changes are producing a gradual change of culture with more focus on internal forms of development such as initiatives supporting high-tech activities and universities with successful new start-ups

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (Table 3.17).

- **Population declines bring important challenges**. Sachsen-Anhalt has lost 336 000 inhabitants in the period 1995-2008, around 12% of its initial population. In comparison to other former eastern German regions the decline is severe, with the second largest absolute population decline (after Sachsen) and the largest relative to its population by three full percentage points. Particularly worrying are the loss of highly skilled and mobile labour and the gradual departure of women, further reducing the birth rates in the medium and long term. The decline in population has led to a significant decline in tax income and national transfers based on population size and raises important issues of the region's medium and Long-term sustainability.
- **The brain drain represents a loss of human capital potential.** Despite the presence of important higher educational institutes, the region has experienced significant brain drain as graduates have left in search of jobs with higher wages elsewhere. In the past the region had an excess of students applying for apprenticeships but now it is the other way around with many apprenticeships available but not enough students. As a result, the proportion of highly skilled labour lags behind other German regions, with the proportion continuing to decline over the period 1999-2007 by 3.5 percentage points at a time when it was increasing elsewhere.
- **Low levels of innovation.** This is driven by several elements. The industrial activities attracted after reunification consisted mainly of sub-supply and final assembly of products with no company headquarters moving to the area. The region also faces obstacles to enhancing links between the universities and the private sector because universities have retained the tradition of being evaluated purely by their publications and teaching. There are no strong incentives for the universities to co-operate with the private sector.

Table 3.17. **Statistical summary, Sachsen-Anhalt**

	Period	Sachsen-Anhalt	Germany	OECD	National gap	OECD gap
Levels						
GDP pc	1995	15 316	24 680	18 926	62%	81%
	2007	20 386	28 232	24 597	72%	83%
GDP	2007	49 480	2 015 780			
GDP share	1995	2.13%	n.a.			
Productivity	1995	36 923	58 291	44 513	63%	83%
	2007	45 933	60 786	54 713	76%	84%
Area (in km^2)		20 447	357 109			
Area share of national		5.73%				
Population	2008	2 412 472	82 217 837	3 481 456		
Population share	2008	2.93%	n.a.	n.a.		
Population density	2008	134	230	263		
Elderly dependency ratio	2008	35%	31%	21%		
Youth dependency ratio	2008	15%	19%	28%		
Motorway density (p)	2008	0.17	0.15	0.20		
Motorway density (a)	2008	19.91	35.40	21.91		
Primary attainment % LF	2008	6.3%	11.1%	27.4%		
Tertiary attainment % LF	2008	25.4%	28.1%	26.0%		
Unemployment rate	2008	14.6	9.0	6.3	5.52	8.3
Employment rate	2008	67.3	70.2	66.7	-2.87	0.7
Long-term unemployment	2008	9.26	5.0	2.4	4.26	6.9
Youth unemployment	2008	18.25	12.2	15.3	6.06	2.9
Patent applications	2007	108.88	1139.1	430.0		
Patents per million	2007	44.9	164.3	85.6		
R&D to GDP	2005	1.13%	2.08%	1.55%		
BERD to GDP	2005	0.33%	1.21%	0.93%		
GERD to GDP	2005	0.39%	0.43%	0.25%		
Changes						
GDP pc growth	1995-2007	2.41%	1.13%	2.2%		
GDP growth	1995-2007	1.35%	1.19%	2.8%		
Productivity growth	1995-2007	1.84%	0.35%	1.83%		
Population growth	1995-2008	-1.00%	0.05%	0.6%		
WA population growth	1995-2008	-1.19%	-0.18%	0.8%		
Elderly dependency (pp change)	1995-2008	12.54	0.09	2.50		
Youth dependency (pp change)	1995-2008	-9.31	-0.04	-6.28		
Primary education (pp change)	1999-2008	-1.76	-3.12	-6.09		
Tertiary education (pp change)	1999-2008	-3.51	0.82	5.84		
Employment rate (pp change)	1999-2008	9.71	7.06	1.87		
Unemployment rate (pp change)	1995-2008	-2.14	-2.75	-1.82		
Patents per million (pp change)	1995-2007	34.07	111.83	53.29		
R&D to GDP (pp change)	1995-2005	-0.22	0.11	0.13		

Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

San Luis Potosi, Mexico

Figure 3.33. **San Luis Potosi, Mexico**

Regional category: Very large catching-up potential and growing above the national average

Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

San Luis Potosi encompasses four smaller TL3 regions consisting of 58 municipalities. In 2008 its population was 2.47 million, representing 2.32% of the Mexican population. Its population density at 40 people per km^2 is lower than the average in Mexican regions of 54 people per km^2. The region is located in the north-central part of Mexico, with Coahuila, Nuevo Leon, Tamaulipas and

Zacatecas to the north; Guanajuato, Hidalgo and Queretaro to the south; Veracruz to the east and Jalisco and part of Zacatecas to the west.

The four TL3 regions are *i*) Centro, the main industrial hub producing 81.4% of the region's GDP share, home to 49% of the regional population and employing 79% of the workforce; *ii*) Altiplano, containing some industrial activity and an important exporting hub for the US market producing 5.4% of GDP and hosting 12.9% of the population; *iii*) Middle without industrial zones but with a large number of SMEs producing 4% of GDP and hosting 10.6% of the population and finally *iv*) Huasteca in the flat land with 9.2% of GDP and 27.8% of the population. The largest cities are San Luis Potosí, the regional capital, which had 772 604 inhabitants in 2010; Soledad de Graciano Sanchez (267 839), and Ciudad Valles (167 713). San Luis Potosi city and Soledad de Graciano Sanchez together form the larger metropolitan areas of San Luis Potosí, with a total population of 1 040 443 while Ciudad Valles is located 265 kilometres from this larger metropolitan area. The city structure and settlement patterns are thus relatively monocentric. More than half (55%) of the population live in rural communities, slightly higher than the average in Mexican regions. A large share of the population share live in poor rural and semi-rural areas with a large proportion of indigenous people. Consequently there are large variations in GDP *per capita* among the four TL3 regions with Centro's levels standing one and a half times above the regions' average, Huasteca just 50% of the average, Altiplano at 60% and Middle at 70% of the average. Centro has attracted most of the inward migration from 2005-10; in contrast the remaining three TL3 regions are experiencing depopulation with 56.9% of municipalities experiencing population falls in 2005, up from 25.9% in 1995.

San Luis Potosi has experienced two economic shocks in recent years. There was the impact of the ending of Mexico's economy-wide import substitution industrialisation policy in the 1980s. This was followed by the signing of the NAFTA treaty in 1994. This new economic context generated activities in the *maquiladora* industry that benefited not only the northern frontier but also a number of regions and cities located in the central and northern parts of the country, including San Luis Potosi. The region’s favourable strategic location on the main routes for a large portion of seaports, railroads and key national highways has enhanced trade with North American partners and has benefited its logistic sector.

Mexico is a federal state with a two-tier system of sub-national government comprising 31 states and one federal district (Mexico City) at the regional level and 2 440 municipalities at the local level. Although Mexico is a federal country, its policy making remains quite centralised. There has been gradual devolution to the states and municipalities since the 1990s, but sectoral policies are largely designed at the federal government level, making co-ordination with lower levels of government difficult. In the absence of effective co-ordination mechanism, both between different levels of government and across sectors, policy making at the regional and local scale in Mexico is highly fragmented, making it hard to design strategies and policies tailored to local needs.

Economic assessment

The taxonomy classifies San Luis Potosi as region with a very high catching-up potential and growing above the national average. In 1995, GDP *per capita* was USD 5 124 in PPP, around 26% below the Mexican average and 73% below the OECD average in TL2 regions. Over the period 1995-2007, GDP *per capita* grew at a rate of 2.86%, outperforming both the national pace of growth of 2.08% and the average pace of growth in OECD TL2 regions of 2.2%. Consequently the gap in GDP *per capita* more than halved to 12% below the national average and 71% below the OECD average. Population in the region has increased by 0.83% annually, at a time when the national population was growing at 1.17%. GDP overall grew at 3.7%, slightly above the national rate of growth of 3.3% and surpassing the average pace of growth in OECD TL2 regions, at 2.8%, by almost one percentage point. The convergence with national and OECD levels of output is thus driven by both slower population growth and faster GDP growth.

Below we summarise how the region performed compared to national and OECD averages for five key indicators. Figure 3.34 summarises its performance against the national average.

- **The productivity gap has not closed.** Productivity – measured by GDP per employee – stood at USD 16 374 in PPP in 1996, 13% below the national average and 63% below the typical productivity among OECD regions. During the next 11 years, productivity in the region (1.30%) grew slightly below the weighted national productivity growth rate of 1.38%, but it surpassed the un-weighted average of Mexican TL2 regions of 0.82%. It was also below the average productivity growth of all OECD TL2 regions of 1.83%. Consequently although the region's productivity has improved more than average in the other regions, its gap with respect to the national average remains at approximately the same level, 14% below. With respect to OECD standards, its productivity gap increased further, standing 65% below it in 2007.

  - As of 2010, the region's most important sectors in terms of employees include agriculture, forestry, hunting and fishing, employing 18.2% of the workforce (compared to 13.4% nationally); commerce and services (56.4% of the workforce compared to 60.9% nationally) and manufacturing (24.2% compared to 24.5% nationally). The most dynamic sectors for job creation over the period 2008-11 were industry, social and communal services, commerce, and business services.

  - San Luis Potosi's most important clusters are automotive, metal mechanic, food processing, appliances, logistics and glasshouse agriculture. The surge of the industrial sector is due to the region's location and industrial infrastructure. It has become a manufacturing and distribution hub with public and private partnerships developing a number of industrial parks, which provide facilities and services attracting many multinational firms, including General Motors in 2008. These services include a truck/railroad intermodal terminal, an onsite Customs facility, numerous logistics firms and services, and the new customs program, which is a secure, legally recognised quasi free trade zone that offers import/export tax benefits to

international trade firms. It is home to some of the largest and fastest growing manufacturing companies in the country. It has seen increased industrial diversification and strong economic growth. The logistics platform has received international recognition by the Financial Times Business which recognised it in 2010 as having the third highest potential after the free trade zones of Shanghai and Dubai. The agricultural sector has also experienced an important process of modernisation brought by the adoption of glasshouses.

- **Labour market outcomes in the region are adequate.** The region's pre-crisis unemployment was 2.8%, lower than the national rate of 3.0%. Its employment rate in 2007 was 63.6%, almost identical to the national rate of 63.1%, having increased by 7.02 percentage points over the period 1996-2007, significantly more than the 1.81 percentage point that was the average in Mexican regions.

- **Human capital has improved significantly.** Over the period 1995-2005 San Luis Potosi reduced the proportion of low-skilled workers in its labour force by 7.65 percentage points, and increased the proportion of highly skilled ones by 5.51 pp. These gains exceeded national figures of 0.05 pp and 0.04 pp respectively although by 2005 the region still had a higher share of low-skilled workers in its labour force and a lower share of highly skilled ones (69.9% and 15.7% respectively) than nationally. The region has put in place efforts to improve education quality through programmes aimed at supporting the development of students, consolidating curriculum reforms, identifying and diffusing innovative pedagogical strategies and ensuring the region's education is relevant. Programmes have targeted educational centres in disadvantaged and vulnerable social sectors, aiming to increase the opportunities available to students, often young and indigenous ones, from marginalised areas. PROMEX provides resources to university facilities to enable them to hire well recognised professors, and the CONACYT programme offers postgraduate scholarships elsewhere with repatriation clauses, requiring students to come back to the region to work otherwise they have to repay the grants themselves.

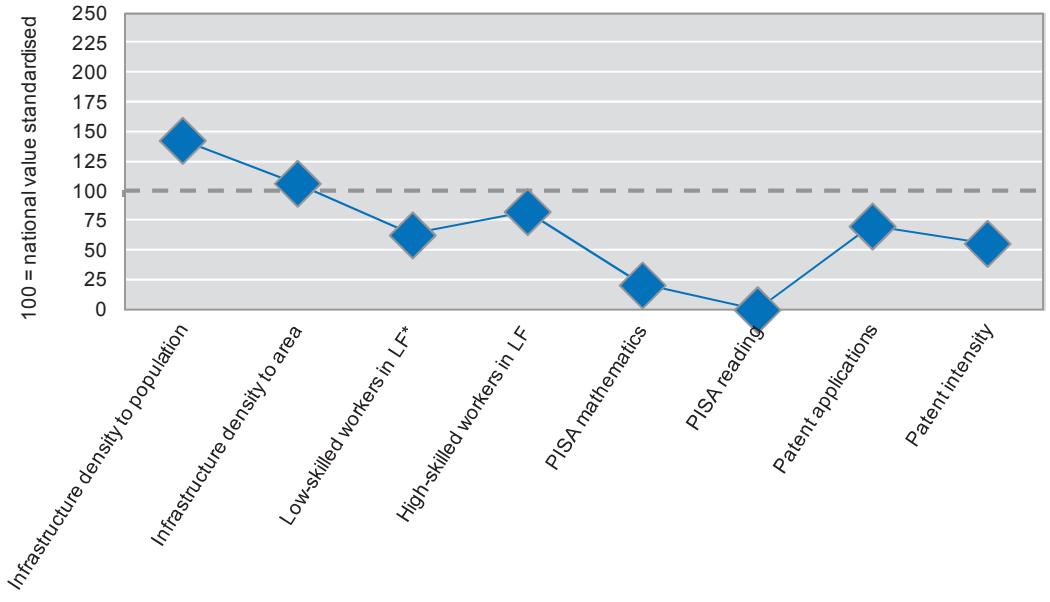
- **Infrastructure is adequate** with higher motorway density than the national average, both with respect to its population (4.68 compared to 3.22 nationally), and with respect to its land area (188 compared to 175 nationally). The region's road network consists of a total of 12 430 km of road. The network is divided into 2 289 km of federal toll roads, 3 596 km of regional roads and close to 6 545 km of rural roads within the municipal and regional jurisdictions. The region is crossed by 12 federal roads connecting it to the entire country. The main infrastructure projects include the modernisation of the Manzanillo-Tampico corridor, the modernisation of San Felipe (Guanajuato) federal road and the future modernisation of the Libramiento Poniente in the city of San Luis Potosi. Future modernisation programmes for rural roads are part of the region's strategic objectives. The region also enjoys excellent railway facilities dominating rail freight across the heart of Mexico. The region also has adequate telephone, cellular and broadband networks.

- **The region is making advances in innovation-related activities**. Overall there were 1.37 patent applications in the region, fewer than the average for Mexican regions of 6.2 or for OECD TL2 regions of 430. Patent intensity, at 0.6 per

million inhabitants, is also significantly lower than the national and OECD figures. Despite these weak figures, the region has been making advances in this area with the construction of technological and innovation development parks, and the most important computation centre in the country. This centre is located in the scientific and technological institute of San Luis Potosi (IPICYT) and, with the services of the national centre of supercomputing, is starting to improve the links between firms and universities and other higher education institutions. With a storage capacity of 70 terabytes and 1 200 microprocessors, this facility provides applications for the computational design of automobiles, simulations of petroleum resources and simulations for detecting flaws in aeronautical and automobile design, and support systems like supply chain management. This infrastructure is helping the gradual development of innovation-related activities, and despite not yet having an impact on the official patent statistics, the region is making important advances in the areas of medicine, chemistry and nano-materials.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.34 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region is lacking most key growth factors with respect to national values except in infrastructure density. The growth of the region in recent years has been mainly driven by exogenous sources and its logistics sector due to its privileged location.

Figure 3.34. **How drivers of growth compare to the national average, San Luis Potosi, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of San Luis Potosi.

- **Taking advantage of a good geographic location.** The metropolitan area of San Luis Potosi sits on the main road and the corridor between Mexico City and Monterrey-Laredo, with links to several cities in the west and north of the country. Its excellent position places it close to Mexico's main markets – effectively equidistant between Monterrey, Guadalajara and Mexico City, the three most important cities in the country, accounting for 80% of national GDP. A large number of the country's railways, national highways and seaport connections pass through the region, making it a strategic location for logistics, distribution and supply chain management. The logistics centre has been important for supporting the region's automotive cluster, providing a gateway to the United States market. The Interpuerto intermodal facility has close links with the North American Inland Port Network, the leading trade association of inland ports in North America, connecting well with the North American market.

- **An abundant labour force with technical skills in dynamic sectors,** such as automobile and metallurgic industries. The region has traditionally enjoyed good vocational skills, having specialised in the railway industry in earlier years. Significant gains in human capital, particularly decreasing the share of low-skilled workers, reflect an increase in vocational skills, especially in key industrial sectors of the metal-mechanical and in the dynamic sectors of cars, appliances and aerospace. The abundance of these skills in combination with an important logistics hub have been important drivers of growth in particular through the attraction of FDI investments to the region.

- **A favourable regulatory environment and policies.** The region has experienced no strikes over the past six years and has simplified its regulatory framework considerably, making it the fourth easiest Mexican region in which to open a new business. Public investments in industrial infrastructure favouring the logistics sector have further supported private sector activity. The favourable business environment has been another significant factor attracting FDI investments.

- **Adequate infrastructure has consolidated an important logistics hub** around the metropolitan areas of San Luis Potosi. Improvements for the logistics hub include an intermodal rail platform that not only provides services to the metropolitan area of San Luis Potosi but has expanded its market towards the cities of Aguascalientes, Leon-Silao, Celaya and Queretaro, to the detriment of competitors located in these cities. In addition the airport of San Luis Potosi has consolidated into a service hub providing air cargo and distributing packaging to the entire territory close to this area.

- **Links between firms and universities have improved**, although to date they have not yet provided significant returns in terms of their impact on the region's development. Policies co-ordinating and linking industries with cluster development have been targeted in the State Development Plan of 2009-2015.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.18).

- **Limited local business capacities**. Local businessmen still specialise in traditional sectors such as the clothing industry, retail commerce, professional services and agriculture. Over the period of investigation these business sectors did not complete any significant initiatives to take advantage of new opportunities emerging in the region driven by the expansion of the region's most dynamic sectors. Such initiatives might have included upgrading the quality of their management systems and improving their workforce skills.

- **A culture of low co-operation among businesses**. Even though governmental representatives and the academic community are aware the cluster approach there are still important initiatives that could give rise to active and dynamic inter-firm co-operation which are not being taken.

- **Problem of urban development**. Between 1980 and 2010 the population of the metropolitan area of San Luis Potosi grew by 120% at a time when its land area expanded by 740%. This urban sprawl is due to the expansion of industrial areas south of the city through the Mexico-Monterrey corridor and the expansion of low-income housing associated with the industrial areas in the municipality of Soledad de Graciano Sanchez. The main services in the region are provided mainly in the city of San Luis Potosi, which gives rise to high levels of commuting between the city centre, the areas of low-income housing and the areas of industrial activity. Commuting pressures have brought high levels of congestion at peak hours. The construction of multi-level beltways has still not resolved the problem completely. So far an efficient urban system capable of accommodating the mobility needs of inhabitant commuting between their place of residence, their place of work and their service providers has still not been implemented.

- **Connectivity with the ports of Tampico-Altamira**. The ports of Tampico-Altamira have an important and growing market encompassing the growing region of Centro-Norte in the northern part of the country, yet the corridor to San Luis Potosi has significant bottlenecks on both the road and rail infrastructure. Improving these bottlenecks could strengthen the position of the city of San Luis Potosi as a transportation hub in this part of the country, as well as favouring growth in smaller cities within the region located along the corridor including Ciudad Valles and Río Verde-Ciudad Fernandez. Improvements in this area are likely to occur once the Kansas City Southern intermodal facility and the main Mexican hub in San Luis Potosi are fully operational providing transoceanic communications between the port of Lazaro Cardenas-Tampico-Altamira, and Mexico´s Central Region and NAFTA corridor.

Table 3.18. **Statistical summary, San Luis Potosi**

	Period	San Luis Potosi	Mexico	OECD	National gap	OECD gap
Levels						
GDP pc	1995	5 124	6 879	18 926	74%	27%
	2007	7 184	8 808	24 597	82%	29%
GDP	2007	17 683	630 945			
GDP share	1995	1.90%	n.a.			
Productivity	1996	16 374	18 837	44 513	87%	37%
	2007	18 880	21 891	54 713	86%	35%
Area (in km^2)		61 137	1 959 244			
Area share of national		3.12%				
Population	2008	2 473 678	106 682 518	3 481 456		
Population share	2008	2.32%	n.a.	n.a.		
Population density	2008	40	54	263		
Elderly dependency ratio	2008	10%	9%	21%		
Youth dependency ratio	2008	51%	46%	28%		
Motorway* density (p)	2006	4.68	3.22	n.a.		
Motorway* density (a)	2006	188.41	175.14	n.a.		
Primary attainment % LF	2005	69.9%	66.9%	27.4%		
Tertiary attainment % LF	2005	15.7%	16.4%	26.0%		
PISA mathematics	2009	394	419	500		
PISA reading	2009	339	425	500		
Unemployment rate	2007	2.8	3.0	6.3	-0.17	-3.5
Employment rate	2007	63.6	63.1	66.7	0.44	-3.1
Patent applications	2006	1.37	6.2	430.0		
Patents per million	2006	0.6	1.6	85.6		
Changes						
GDP pc growth	1995-2007	2.86%	2.08%	2.2%		
GDP growth	1995-2007	3.7%	3.3%	2.8%		
Productivity growth	1996-2007	1.30%	1.38%	1.83%		
Population growth	1995-2008	0.83%	1.17%	0.6%		
WA population growth	1995-2005	1.60%	1.89%	0.8%		
Elderly dependency (pp change)	1995-2008	1.56	0.01	2.50		
Youth dependency (pp change)	1995-2008	-18.16	-0.17	-6.28		
Primary education (pp change)	1995-2005	-7.65	-5.27	-6.09		
Tertiary education (pp change)	1995-2005	5.51	3.59	5.84		
PISA Mathematics (pp change)	2003-2009	19.00	33.52			
PISA Reading (pp change)	2003-2009	-57.00	25.19			
Employment rate (pp change)	1996-2007	7.02	1.81	1.87		
Unemployment rate (pp change)	1998-2007	1.63	1.06	-1.82		
Patents per million (pp change)	1997-2006	0.21	0.83	53.29		

Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age, p = population; a = area. * Motorway data for Mexico includes motorways and secondary roads.

Source: OECD Regional Database (2011).

Sicilia, Italy

Figure 3.35. **Sicilia, Italy**

Regional category: Very large catching-up potential and growing below the national average

Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Sicilia encompasses eight smaller TL3 regions: Trapani, Palermo, Messina, Agrigento, Caltanissetta, Enna, Catania, Ragusa and Siracusa. Its population in 2008 was 5.03 million, or 8.5% of the Italian population. Its population density at 195 people per km^2 is around the national average of 198, and below the average density in TL2 regions of 263. The region is an island located in the Mediterranean Sea southwest of Italy. The closest mainland region is Calabria to the northeast, around 5 km away at its closest point.

The largest city is Palermo, Italy's fifth largest city with around 750 000 inhabitants, followed by Catania (306 464), Messina (260 000) and Syracuse (124 453). Although the island is dominated by the large size of Palermo, its structure is quite polycentric due to the significant role played by the three other cities, which all host ancient universities. Just under a quarter, or 23%, of the population in the region live in rural communities, lower than the figure for Italy as a whole, at 33% and the OECD average of 45%.

Since the 1950s the region has been targeted by an important national programme aimed at industrialising the south and strengthening its infrastructure (in popular parlance, the *Intervento Straordinario*). That programme has significantly increased the region's social infrastructure which was either never developed or destroyed by the Second World War. The programme was renewed with the national law 488 1992, triggering a process of negotiated planning agreements aimed at better suiting publicly funded projects to the particular nature of the regional economy. During the early 1980s the region experienced EU funding programmes (including the Integrated Mediterranean Programmes) which earmarking European funds for the introduction of a system of planning for regional development. From the second half of the 1990s Sicilia – alongside other European lagging areas – has benefited from the support of the regional policy co-financed by EU Structural Funds in combination with specific national and regional funds which for the first time took on a central role in the dynamics of the general economic transformation of the Sicilian system. To this extent the region has largely depended on public, mainly exogenous, sources to pursue economic development goals.

Italy is a unitary state with a three-tier system of sub-national government. The top tier consists of 20 regions (*regioni*). The second tier comprises 103 provinces (*province*) and the third tier 8 101 municipalities (*comuni*). In 2006 31.5% of all spending was devolved while regions and below accounted for 20.3% of total revenue. Sicilia has a special status, sanctioned in May 1946 and subsequently enshrined in constitutional law in February 1948. The region enjoys additional legislative and administrative powers in matters which for the ordinary regions would fall under the ambit of the state and also enjoys additional financial autonomy.[24] Some of these additional competences are: enhancement of cultural and environmental assets, civil protection, and vocational training.

Economic assessment

The taxonomy classifies Sicilia as a region with very large catching-up potential, growing below the national average for the period of the project as a whole (1995-2005). When applying the taxonomy over an extended period (1995-2007) with revised data the region showed a slightly higher growth rate in GDP *per capita*, potentially changing its category. For the purpose of this case study, however, we keep the original classification of the region due to its lower overall GDP growth and its lower productivity growth. According to revised data, in 1995 GDP *per capita* was USD 13 437 in PPP dollars, around 37% below the national figure and 29% below the OECD average in TL2 regions. Over the period 1995-2007, GDP *per capita* grew at a rate of 1.95%, slightly higher than the national rate of 1.89% but below the OECD TL2 rate of 2.2%. Consequently the gap in GDP *per capita* remains at around 36% below the national figure, but is falling further behind the OECD to 31% below the average. Population in the region increased at a rate of just 0.03%, slower than Italy as a whole at 0.37% and the OECD regions at 0.6%. GDP overall grew at 1.98%, which was below the national rate of 2.3% and the OECD rate

of 2.8%. In sum the region remains lagging in national and in OECD terms with both GDP and population growing at a slower pace than national and OECD levels.

Below we summarise how Sicilia performs compared to national and OECD averages for five key indicators. Figure 3.36 summarises its performance against the national average.

- **Productivity is lagging**. Productivity – measured by GDP per employee – stood at USD 48 443 in PPP in 1995, 12% below the national average and 9% above the OECD average. From 1995 to 2007, productivity grew at rate of 1.39%, slower than the national rate of 1.79% and the OECD TL2 average of 1.83%. Therefore by 2007 the gap in productivity has increased further, falling 16% below the national level, and reducing its lead over OECD productivity levels to only 5%.

  - The region's most important sector is services, which accounts for 78% of the total value-added in the economy and which has experienced significant growth in recent years. The most important service sub-sectors (by order of importance in value-added) are: the public sector, monetary and financial intermediation; commerce, reparations, hotels and restaurants; transport and communication; and real estate activities, rentals, IT, research, and other professional and entrepreneurial activities. Within industry, petrochemicals is the most important sub-sector followed by manufacturing, in particular tanning, leather processing and similar; timber, rubber, plastic and other factory products; and textiles and clothing. In recent years the region has struggled to overcome international competition brought by the increasing commercial penetration of goods made in China and other countries specialising in similar sectors to Sicilia. Agriculture-related activities have experienced notable gains, in particular in food production, with wine and grape production experiencing a notable increase in turnover and export share over the last decade. Activities have also surged in microelectronics. These last two gains can be partly attributed to a new generation of entrepreneurs with greater managerial skills and an innovative corporate vision.

  - Sicilia has adopted a new strategy of systematically supporting the development of existing and rising productive districts, aimed at implementing the EU cohesion policy more effectively in 2007-13. The provisions of Article 56 of Regional Law 17/2004 recognised districts as potential actors for the development of local production systems in accordance with a strategic territorial and sectoral instrument represented by the "Pact for the development of the district".[25] The region has recognised 23 productive districts of which 11 concern the agrifood sector. In addition, three further technology clusters of nationwide importance were identified at regional level (agro-bio fisheries, transport and marine micro- and nano-systems), following a Memorandum of Understanding signed by the Ministry of Education and Scientific Research and the Region.

- **Labour market outcomes are inadequate** with worse pre-crisis unemployment rates than national and OECD rates (13.8% as opposed to the national rate of 6.9% and the OECD rate of 6.3%), higher rates of long-term unemployed (8.03% as opposed to 3.2% and 2.4%) and especially higher rates of youth unemployment at 39.3%, almost twice

as high as the national rate of 20.9% and more the twice the typical rate in OECD TL2 regions. Employment rates in the region are 44.5%, significantly below the national rate of 60.4% and the OECD average of 66.7%. Despite positive development in recent years, the gains in the employment rate (4.4 full percentage points) have been lower than the Italian average.

- **Human capital has improved but remains below national standards.** In 2008, the share of low-skilled workers − those with only primary qualifications − in the labour force was 45.3%. At 16.5%, the region has a slightly smaller share of highly skilled workers than nationally. Over the period from 1999 to 2008 Sicilia reduced the proportion of low-skilled workers in its labour force by 6.22 percentage points, and increased the proportion of high-skilled workers by 2.92 points. These changes exceeded the national figures, which recorded a drop of 0.10 percentage points in low-skilled workers and an increase of 0.05 percentage points in highly-skilled ones, but the region still remains below national, and especially OECD standards (see Table 3.19). As shown by numerous surveys (e.g. OECD-PISA), Sicilia has high levels of educational fragmentation, a consistent number of students leaving school early, as well as high percentages of students with low skills. As a result, regional strategies and activities have focused on reinforcing educational and training courses as part of a lifelong learning strategy. The region invests a notable amount of financial resources which are allotted in the regional programming of the Structural Funds, specifically the European Social Fund (ESF). The regional project for lifelong learning (regarding both initial education/training and continuing/lifelong education) prioritises minimising the existing deficiencies in the school and training systems. Its main goal is to improve levels of knowledge and to strengthen people's skills, and not just the basic ones, so that they can respond better to the needs of the regional production system.

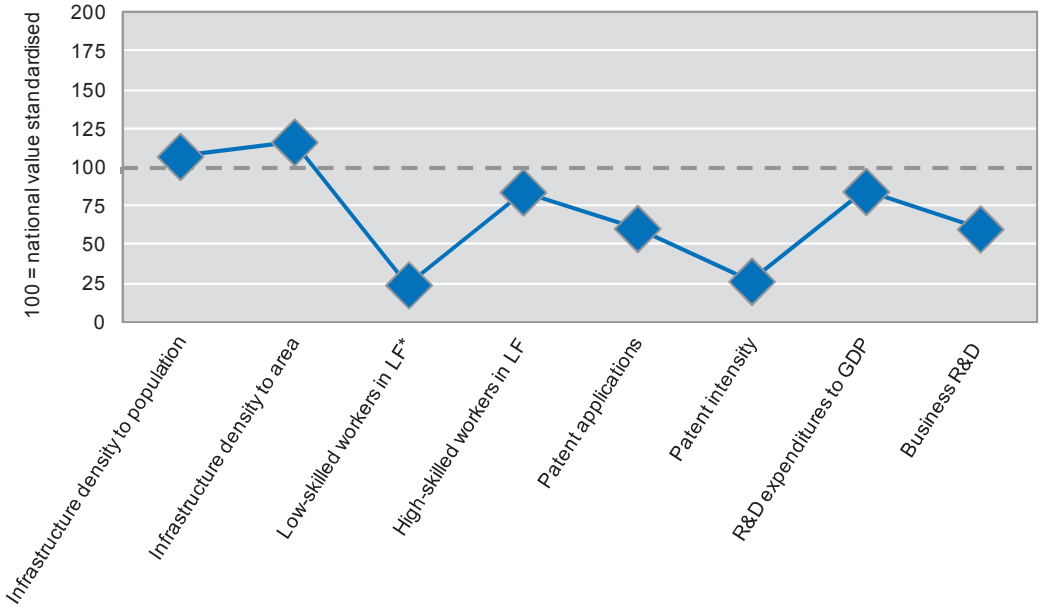
- **Infrastructure is adequate**, particularly the motorway system, with higher density than the Italian average both relative to population and land area. Motorway density relative to populations was 0.13, exceeding the Italian average of 0.11, but well below the average value of OECD regions of 0.20. With respect to land area, motorway density was also higher at 25 than the Italian average of 21.86 and the OECD average of 21.91. The core transport infrastructure projects have been financed by EU and national regional policies. This structural support has reinforced the main transportation networks and, together with the concurrent liberalisation of the transport service market, has produced significant improvements in territorial accessibility in recent years, both in air and sea transportation, and in relation to the internal mobility needs on the island. Projects included the completion of the Messina-Palermo and Catania-Syracuse motorways, a second track for the Messina-Patti railway line, the Circumetnea Railway in Catania and the Palermo underground system, and the Catania Freight Terminal area bringing potential synergies with the sea port in Augusta. Although EU Cohesion policy aided the development of these main networks, Sicilia is suffering from a progressive deterioration of its service capacity due to increasing rationing of national funds. In addition, the region suffers from a significant lack in broadband and other ICT infrastructure.

- **Innovation intensity remains below national standards**. The region has fewer overall patent applications (40.1) than the Italian average of 153.5 or the OECD average of 430. Patent intensity in relation to population is also significantly lower at 8.0; around one-sixth of the national average of 46.1 and even lower than the OECD's

at 85.6. R&D expenditures as a proportion of GDP are slightly lower at 0.80% than national levels of 0.89% and around half the OECD average of 1.55%. The share of business R&D expenditure is 0.21% of GDP, lower than the Italian average of 0.38% and less than a quarter of the OECD figure of 0.93%. Public-sector expenditures is also lower as a share of GDP at 0.12%than the Italian average of 0.16% and less than half of what the public sector typically invests in OECD regions (0.25%). The region has experienced significant increases in R&D investment over recent years, increasing 0.22 percentage points against the national average of 0.07. The arrival of a multinational corporation (ST Microeletronics) in Catania has triggered the emergence of a nationally important technological district, initially spurring growth in small technological businesses around the plant, but more recently concentrating on demand from extra-regional markets. These businesses clusters have produced industrial spin-offs increasing investments in scientific research (biotech and nanotech), promoting supplementary job opportunities in high-tech sector at local level and creating more skilled labour force demand by the region's education system.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.36 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region has higher infrastructure density than Italy as a whole but its human capital levels are quite low, as is its innovation intensity. A challenge for the region is improving its innovation output in relation to R&D expenditures.

Figure 3.36. **How drivers of growth compare to the national average, Sicilia, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors which have influenced the performance of the region:

- **Significant improvements in transport infrastructure** have created greater accessibility over medium and long distances and greater efficiency for the movement of goods and people. These activities, combined with the liberalisation of the transport service market, have produced significant improvements in the conditions of territorial accessibility, both in and out of the island, and within it.

- **Improvements of the Sicilia brand** have brought important gains to the agro-industry sector and in tourism. Various actors are beginning to focus on building the "made in Sicily" brand to increase foreign market penetration of key regional products, including wine, and to attract tourism to the island and develop its tourism potential. The region has seen a significant growth in tourism, at least up until the crisis of 2008, strongly contributing to the growth of GDP *per capita*.

- **Small-scale examples of innovation** are present in the agro-industry sector, with the opening of production divisions aimed at extra-regional markets, and in the microelectronic sector with the creation of businesses clusters around a large multinational, ST Microeletronics. Initiatives between the University of Catania and the ICT/renewable energy cluster in and around that city have generated private sector spin-offs and jobs. As a result, an international joint venture between ST Microelectronics, ENEL Green Power (the Italian leader firm in the renewable energy sector) and Sharp, has invested in the production of third-generation photovoltaic panels. The agri-food and wine industry is thriving in the south-east (Caltanissetta and Ragusa) and the west (Trapani, Palermo and Agrigento) of the island, as is the sector's export capacity.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.19).

- **Lack of a paradigm shift towards internal growth policies** capable of promoting the region's endogenous growth potential. The region has been subjected to EU and national intervention programs and initiatives aimed at promoting development based on mainly exogenous transfers over prolonged periods of time, creating an entrenched culture of dependency. The presence of organised crime has exacerbated the problem by hindering the development of business initiatives and distorting the proper functioning of the market economy (for example through rackets, off-the-books employment, infiltration of public works, recycling of earnings from illicit activities in business initiatives).

- **Lack of political vision to challenge the status quo**. The region faces structural challenges exacerbated by governance arrangements not capable of responding effectively. Technical experts and other officials within the regional government and in the private-sector associations and industry groups are keenly aware of the scope of these challenges and have a clear sense of what to do to address them but lack the political vision to bring a change. There is insufficient institutional co-ordination at sub-central level, which could be harnessed to challenge the status quo, complicating the situation. As a result, public services are inadequate particularly those dealing with the needs of businesses and essential services for the population including among others education, health, energy and ICT.

- **An uncompetitive and undynamic private sector.** The region has suffered from a significant brain drain of young, productive talent caused by inefficient specialisation and a prevalence of small and micro businesses active in the traditional sectors. The industrial base is atomised, with a significant portion dependent on public-sector spending. This is accompanied by a widespread under-capitalisation of companies as a result of the rationing of credit. As a consequence there is a little demand for investment in innovation and a prevalence of low-skilled jobs in the labour market.

- **Institutional capacity building should be improved.** There is still not sufficient capacity to measure the impact of public investment, even though important results have been achieved in some fields. In particular, the EU Cohesion policy has promoted a culture of policy outcomes and impact evaluation: several monitoring instruments and evaluation practices are now in place at regional level, although they could be better employed in order to guide policy decision making processes. The region's institutional capacity for developing long-term vision and policy planning appears to be poorly developed. Policy initiatives are still driven by the need to register immediate impacts on job creation and development, even if these impacts are ephemeral, if not actually detrimental to long-term sustainability. This focus on short-term expediency, combined with the low capacity of the region to retain talent, fosters a governance approach that makes effective co-operation between levels of government difficult. In the last decade, however, the region has taken many important steps towards a more efficient organisation and a more effective planning and management of policies. At the prompting of the EU, the region adopted regional strategies for the first time in several sectors (such as energy, protection of the territory from natural disasters, R&D, and management of water and waste). Since the 2000-06 Structural Funds programming period, regional administrative departments have experimented with institutional mechanisms of co-operation both horizontally and vertically, promoting a renewed approach to public governance. The experience of PIT (Territorial Integrated Projects) allowed regional departments and local bodies to co-operate in planning and implementing place-based projects, promoting a new partnership in the management of local development patterns. The lessons learned from this experience have been used to launch a new regional strategy for local development, based on a negotiated process which involves all different stakeholders.

Table 3.19. **Statistical summary, Sicilia**

	Period	Sicilia	Italy	OECD	National gap	OECD gap
Levels						
GDP pc	1995	13 437	21 213	18 926	63%	71%
	2007	16 945	26 544	24 597	64%	69%
GDP	2007	85 120	1 205 851			
GDP share	1995	5.40%	n.a.			
Productivity	1995	48 443	54 850	44 513	88%	109%
	2007	57 185	67 871	54 713	84%	105%
Area (in km^2)		25 711	301 336			
Area share of national		8.53%				
Population	2008	5 029 683	59 619 290	3 481 456		
Population share	2008	8.44%	n.a.	n.a.		
Population density	2008	195	198	263		
Elderly dependency ratio	2008	28%	31%	21%		
Youth dependency ratio	2008	24%	21%	28%		
Motorway density (p)	2007	0.13	0.11	0.20		
Motorway density (a)	2007	25.05	21.86	21.91		
Primary attainment % LF	2008	45.3%	38.6%	27.4%		
Tertiary attainment % LF	2008	16.5%	17.0%	26.0%		
Unemployment rate	2008	13.8	6.9	6.3	6.88	7.5
Employment rate	2008	44.5	60.4	66.7	-15.89	-22.2
Long-term unemployment	2008	8.03	3.2	2.4	4.88	5.7
Youth unemployment	2008	39.32	20.9	15.3	18.43	24.0
Patent applications	2007	40.09	153.5	430.0		
Patents per million	2007	8.0	46.1	85.6		
R&D to GDP	2005	0.80%	0.89%	1.55%		
BERD to GDP	2005	0.21%	0.38%	0.93%		
GERD to GDP	2005	0.12%	0.16%	0.25%		
Changes						
GDP pc growth	1995-2007	1.95%	1.89%	2.2%		
GDP growth	1995-2007	1.98%	2.26%	2.8%		
Productivity growth	1995-2007	1.39%	1.79%	1.83%		
Population growth	1995-2008	0.03%	0.37%	0.6%		
WA population growth	1995-2008	0.00%	0.04%	0.8%		
Elderly dependency (pp change)	1995-2008	5.39	0.06	2.50		
Youth dependency (pp change)	1995-2008	-4.74	0.00	-6.28		
Primary education (pp change)	1999-2008	-6.22	-9.62	-6.09		
Tertiary education (pp change)	1999-2008	2.92	5.01	5.84		
Employment rate (pp change)	1999-2008	4.40	5.91	1.87		
Unemployment rate (pp change)	1999-2008	-10.67	-4.57	-1.82		
Patents per million (pp change)	1995-2007	6.03	35.61	53.29		
R&D to GDP (pp change)	1995-2005	0.22	0.07	0.13		

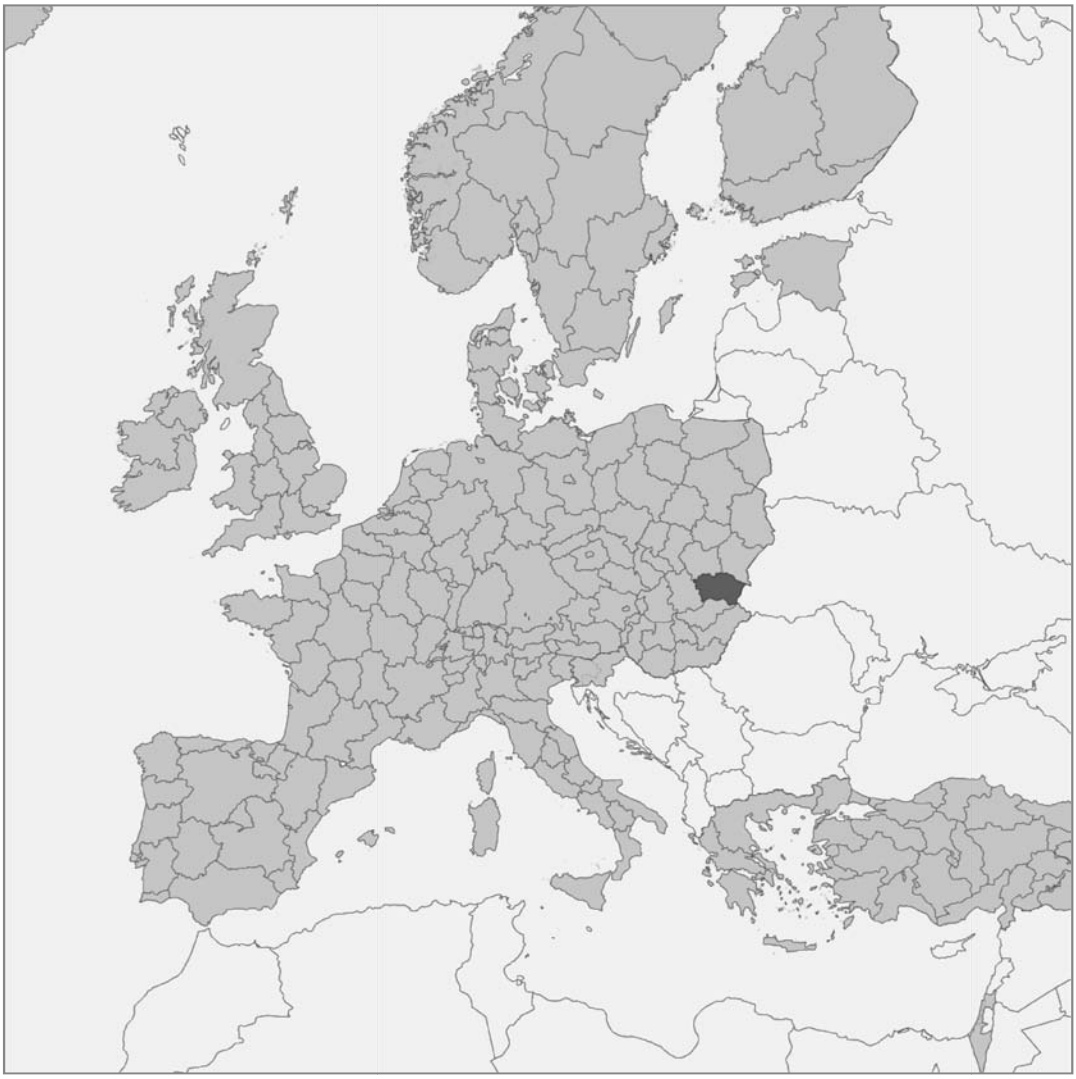
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Východné Slovensko, Slovak Republic

Figure 3.37. **Východné Slovensko, Slovak Republic**

Regional category: Catching-up potential and growing below the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Východné Slovensko had a population of 1.6 million inhabitants in 2008, or 29.1 of the Slovakian population. The region's GDP totalled USD 15.98 million in PPP dollars in 2007, contributing 19.8% of national GDP. The region consists of two self-governing regions (*kraj*), Prešov and Košice. Forty-two percent of the population live in rural communities, defined as those with a population density of less than 150 inhabitants per km^2. The largest city in the region is Košice, the second largest the country after the capital Bratislava, with 233 659 inhabitants, followed by Prešov with 91 650 (161 000 in

the wider metropolitan area), Poprad with 55 052 (100 000 in the wider metropolitan area), Michalovce with 40 255 and Spišská Nová Ves with 38 357.

Like most Eastern European economies, Východné Slovensko experienced a process of economic transformation and market liberalisation after 1989 as part of a transition to a market-based economy, and the collapse of its traditional markets and large enterprises providing employment opportunities in the region. Slovakia joined the European Union (EU) in 2004, entered the Schengen area in 2007 and adopted the Euro in 2009, three events which brought significant changes to the region especially in the context of its location far away from its new main markets.

The Slovak Republic has established a framework for regional governance and recently introduced a new regional development act. The act defines the goals and conditions of support for regional development. It determines the competences of the state administration, higher territorial units, municipalities and other actors of territorial co-operation. The next step is to launch economic development strategies defined at the regional level.

Economic assessment

The taxonomy classifies Východné Slovensko as a region with a catching-up potential, growing below the national average. In 1995, GDP *per capita* was USD 5 484 in PPP terms, 24% below of the national average of 7 245. Over the period 1995-2007 its annual rate of growth was 5.26%, lower than the national average of 6.21% but more than twice the average pace of OECD TL2 regions. Consequently, the gap widened nationally, to a GDP *per capita* of just 32% below the rest of the country, but narrowed with the rest of the OECD, from 71% below in 1995 to 59% in 2007.

Below we summarise how Východné Slovensko performs compared to national and OECD averages for a number of key indicators. Figure 3.38 summarises its performance against the national average.

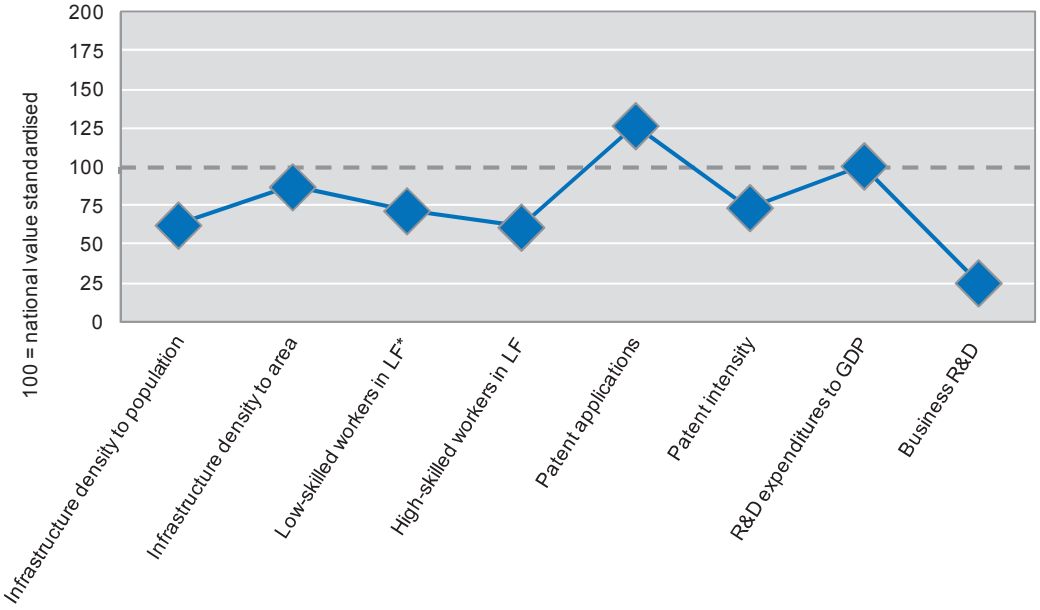
- **Productivity is lagging.** In 1995, productivity – measured by GDP per employee – stood at USD 15 099 in PPP in Východné Slovensko, 18% below the national average and 66% below the OECD average. From 1995-2007, productivity in the region grew at a rate of 4.66%, below the national rate of 6.26% but surpassing the OECD average rate (1.83%) by more than four percentage points. Consequently the productivity gap widened to 24% below the national average and with the OECD it has closed to 52%. Despite this, productivity in the region remains half the level of the average of OECD TL2 regions. The main sectors in the region are industry (automation, robots technology, packaging technology), real estate services, pharmaceuticals, wood, textiles and an emerging IT sector.

- **Labour market outcome are inadequate**. The region's performance trails the national and OECD average with higher rates of pre-crisis unemployment (13.2% compared to 9% in the Slovak Republic and 6.3% in the OECD), higher rates of long-term unemployment (9.4% compared to the national rate of 6.2% and the OECD rate of 2.4%), youth unemployment (27% compared to 17.7% in the country and 15.3% in the OECD) and lower rates of employment (56.5% compared to the national rate of 63.7% and the OECD rate of 66.7%).

- **Human capital has improved but remains slightly below the national average**. The proportion of low-skilled workers – those with only primary attainments – in the labour force stands at 6.8%, slightly above the national rate of 6.3%. The proportion of highly skilled workers – those with tertiary educational qualifications – is 14.4%, lower than the national rate of 18.6%. In recent years the share of low-skilled workers in the region has fallen by 7.2 percentage points, while the share of highly skilled workers in the region has increased by 4.6 percentage points, at a time when the have remained unchanged nationally.
- **Innovation is quite low** with only 7.7 patent applications per million inhabitants, around one-sixth of the national value and less than one-tenth of the OECD average value of 85.6. Business expenditure on R&D is similarly low, at 0.12% of regional GDP, around half of the national average of 0.24% and almost one-tenth of the OECD average of 0.93%. Public sector expenditure on R&D, at 0.07% of GDP is also significantly below national (0.14%) and OECD levels (0.25%).

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.38 presents an integrated picture of several critical growth drivers identified in this section). Looking at the picture for Východné Slovensko as a whole, the region is especially lacking in infrastructure and human capital. Innovation levels are mixed with higher numbers of patent applications in total but lower patent intensity and a very low involvement of the business sector in R&D.

Figure 3.38. **How drivers of growth compare to the national average, Východné Slovensko, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

The most critical factors influencing the performance of the region include:

- **Low wages attracted significant foreign investment** such as the large multinational Embraco in 1997, currently employing 2 500 workers, or the purchase of the complete metallurgical operation in Kosice by U.S. Steel Corporation in 2000. Despite these investments, 80% of Slovakia's FDI was located in other regions, especially in the west. Low labour costs are nowadays no longer so important an asset to the region due to China's competition.
- **Good border co-operation** both with Poland and with Hungary and active participation in EU cross border co-operation programmes.
- **Tourism development has played an important role.** The region is one of Slovakia's most popular tourist destinations attracting tourists from Poland, Ukraine, Russia and the Czech Republic and possessing abundant cultural and historical sites. The region intends to create a tourism cluster to further develop this sector.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.20).

- **Unfavourable geographic location**. After entry to the EU the region changed from being one with a good location with respect to its Eastern European markets and Ukraine, to being peripheral to its Western markets, separated by mountainous terrain from its capital regions. The terrain in the region is also challenging for production purposes with 40% of its land composed of forest and 52% protected under NATURA 2000.
- **Inadequate infrastructure with low motorway density.** Východné Slovensko has approximately half the motorway density of the rest of the country, both in relation to population and to its land area. When compared to OECD levels motorway density in the region is around one-fifth of the OECD average. Better connections between its two main cities, Košice and Prešov, are particularly important in order to make the most of the common functional area and its 800 000 inhabitants. The road infrastructure between Košice and Budapest and to Poland and Ukraine is also poor quality.
- **Brain drain due to insufficient industrial production in the region.** After the demise of the former USSR, many companies went bankrupt after they were unable to adapt to new business and management requirements. Because of the fall in industrial production, the region suffers from outmigration of skilled labour, reflected in a significantly lower employment rate than the national and OECD average. Furthermore, there is insufficient co-operation between the private sector and academia to retain the region’s existing human capital.
- **Unfavourable policy environment**. Regional operational programmes have not been managed at the regional level. There has been little dialogue between the national and the regional levels and inadequate co-ordination mechanisms to ensure the region has any real say in the national policy design. Strategic planning and the identification of priorities in the region lacked proper analysis and objectivity, due to a lack of capacity at regional level. There were no evaluation methods and the whole policy process needs to be more transparent and objective.

Table 3.20. **Statistical summary, Východné Slovensko**

	Period	Východné Slovensko	Slovak Republic	OECD	National gap	OECD gap
Levels						
GDP pc	1995	5 484	7 245	18 926	76%	29%
	2007	10 147	14 929	24 597	68%	41%
GDP	2007	15 979	38 892			
GDP share	1995	19.83%	n.a.			
Productivity	1995	15 099	18 457	44 513	82%	34%
	2007	26 089	34 175	54 713	76%	48%
Area (in km^2)		15 726	49 035			
Area share of national		32.07%				
Population	2008	1 576 042	5 400 998	3 481 456		
Population share	2008	29.18%	n.a.	n.a.		
Population density	2008	97	110	263		
Elderly dependency ratio	2008	15%	17%	21%		
Youth dependency ratio	2008	26%	21%	28%		
Motorway density (p)	2008	0.04	0.07	0.20		
Motorway density (a)	2008	4.20	8.01	21.91		
Primary attainment % LF	2008	6.8%	6.3%	27.4%		
Tertiary attainment % LF	2008	14.4%	18.6%	26.0%		
Unemployment rate	2008	13.2	9.0	6.3	4.18	6.9
Employment rate	2008	56.5	63.7	66.7	-7.16	-10.2
Long-term unemployment	2008	9.43	6.2	2.4	3.23	7.1
Youth unemployment	2008	26.81	17.7	15.3	9.12	11.5
Patent applications	2007	12.12	11.1	430.0		
Patents per million	2007	7.7	10.3	85.6		
R&D to GDP	2005	0.04%	0.04%	1.55%		
BERD to GDP	2005	0.12%	0.24%	0.93%		
GERD to GDP	2005	0.07%	0.14%	0.25%		
Changes						
GDP pc growth	1995-2007	5.26%	6.21%	2.2%		
GDP growth	1995-2007	5.55%	6.26%	2.8%		
Productivity growth	1995-2007	4.66%	5.27%	1.83%		
Population growth	1995-2008	0.25%	0.05%	0.6%		
WA population growth	1996-2008	0.91%	0.71%	0.8%		
Elderly dependency (pp change)	1996-2008	0.30	0.00	2.50		
Youth dependency (pp change)	1996-2008	-11.39	-0.12	-6.28		
Primary education (pp change)	1997-2008	-7.16	-6.92	-6.09		
Tertiary education (pp change)	1997-2008	4.58	4.00	5.84		
Employment rate (pp change)	1999-2008	2.88	3.96	1.87		
Unemployment rate (pp change)	1999-2008	-8.07	-6.32	-1.82		
Patents per million (pp change)	1995-2007	5.07	4.59	53.29		
R&D to GDP (pp change)	2000-2005	0.04	0.04	0.13		

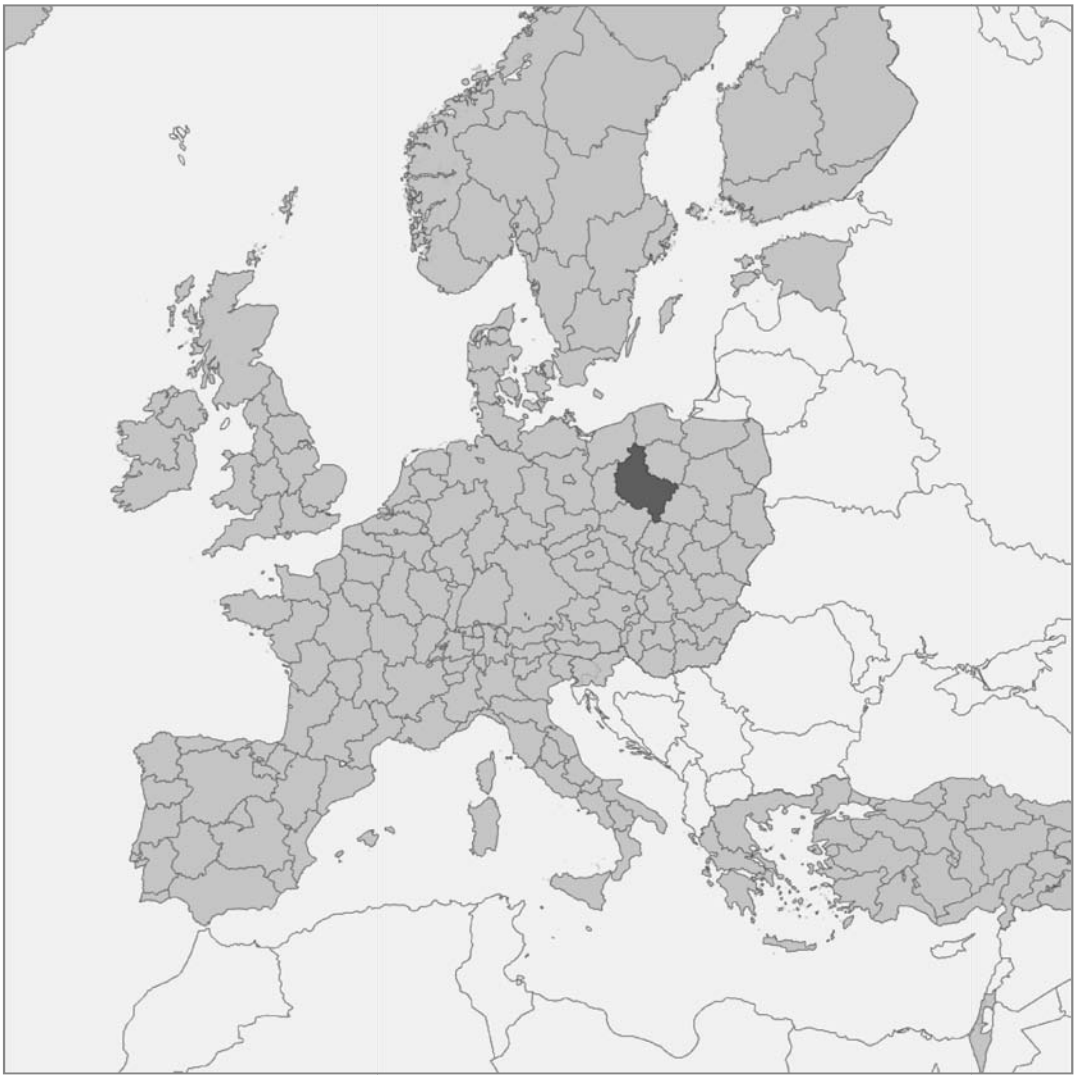
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Wielkopolskie, Poland

Figure 3.39. **Wielkopolskie, Poland**

Regional category: Catching-up potential and growing above the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Wielkopolskie encompasses six smaller TL3 regions within the region: Pilski, Koninski, Miasto Poznan, Kaliski, Leszczynski, and Poznanski. The region had a population of 3.4 million in 2007, 8.8% of the Polish population, with a population density of 112 people per km^2, slightly lower than the Polish average of 122 and less than half the typical OECD TL2 region density. The largest cities are Poznan, with

566 546 inhabitants, Kalisz with 108 575, and Konin with 80 613, followed by Piła (75 044), Ostrów (72 577), Gniezno (70 080) and Leszno (64 079). Just over half (51%) of the population live in rural areas, higher than the Polish and OECD TL2 average of 45%. The region is quite monocentric, dominated by Poznan and the large proportion of inhabitants living in rural communities. It is centrally located both in relation to Poland and the core European markets. It is bordered by Lodzkie to the west, Kujawsko-Pomorskie to the northwest, Zachodniopomorskie to the northeast, Lubuskie to the east, Dolnolslaskie to the southeast and finally Opolskie to the south. All of these neighbouring regions have lower levels of GDP *per capita* than the national average.

The Wielkopolskie voivodship has experienced two important shocks influencing the region's productive and industrial structure during the past decades. First, the transition from a closed communist economy to a fully open market economy combined with the closing of the eastern border in 1999. Then Poland's accession to the EU in 2004 gave the region an important geographical advantage within the region due to its proximity to the western EU borders and its central location between Germany, Poland's main trading partner, and the capital, Warsaw. Membership of the EU has also brought important institutional reforms establishing the Wielkopolskie voivodship.

Poland is a unitary state with three tiers of sub-national government. The top tier consists of 16 regions (*województwa*), the second 379 counties (*powiaty*) and the third 2 478 municipalities (*gminy*). In 2006, 30.7% of all spending was devolved, while the regions and below accounted for 18.9% of total revenue. Poland has gradually decentralised since 1990. A series of administrative reforms since 1999 have resulted in the assignment of a number of specific responsibilities to regional authorities.

Central government is represented in the region by the *wojewoda,* while the regional government is headed by a *marszalek*, who is responsible for planning and managing the region’s development together with the regional assembly, or *sejmik wojewodzki.* The regional government’s key tasks and responsibilities consist of: *i*) formulating a strategic vision of regional development and developing plans based upon it, and *ii*) creating active policies of regional development. The regional government often has to co-operate with other government bodies as well as with other institutions and organisations. It should undertake initiatives to stimulate economic development, improve the competitiveness and innovativeness of the regional economy, maintain its cultural and natural assets, maintain spatial order and harmony, maintain and plan the expansion of social and technical infrastructure at the regional level, and provide regional public services. To these ends it formulates policies covering social development (human and social capital), development of social and technical infrastructure, the financial measures needed to carry out specific tasks, use of natural resources in accordance with the principles of sustainable development, the facilitation of collaboration between research institutions and businesses to promote technological progress and innovation, development of culture and the protection and rational use of cultural heritage. The regional government is responsible for science and education (some post-secondary and secondary education, teachers, training centres, regional libraries); regional roads and public transport (road network development planning, acting as an investor and maintaining roads and traffic engineering devices); health care (specialised facilities, some health spas); social assistance (development and implementation of social assistance programs, vocational training of social assistance institutions staff); culture and national heritage protection (supporting cultural institute), environmental protection and water management (including flood protection; setting fees for waste disposal) and recreational and physical

education. It is also responsible for land-use planning through regional planning offices responsible for formulating and implementing the region's spatial policy. Spatial development policy goals include rational zoning, improving those areas where development problems are concentrated, and modernising rural areas.

Economic assessment

The taxonomy classifies Wielkopolskie as a region with catching-up potential and growing above the national average. In 1995 GDP *per capita* was USD 7 916 in PPP, approximately 2% below the Polish average and around 48% below the OECD average for TL2 regions. Over the period 1995-2007, its GDP *per capita* grew by 5.25%, above the national rate of 4.72% and significantly above the OECD TL2 growth rate of 2.2%. Consequently the region overtook the rest of the country with a GDP *per capita* of 5% above the national average by 2007. It also closed the gap with respect to the OECD to just 40% below the average. Its population increased by 0.13% at a time when the Polish population fell by 0.10%, and the OECD population increased by 0.6%. GDP growth overall was 5.4%; above the national growth rate of 4.62% and almost double the OECD rate of 2.8%. The region's dynamic growth is driven by both faster population increases and faster GDP growth *per capita*.

Below we summarise how Wielkopolskie performs compared to national and OECD averages for five key indicators. Figure 3.40 summarises this performance against the national average.

- **Productivity has surpassed national and OECD productivity growth rates**. Productivity – measured by GDP per employee – stood at USD 24 605 in PPP in 1995, 25% above the national average but 45% below the average for OECD regions of 44 513. During an eight year period, productivity in the region grew by 4.87%, below the national unweighted average (6.63%) but above the average productivity growth in Polish regions (4.20%) and significantly above the rate for OECD TL2 regions of (1.83%). Consequently the region's productivity remains above the national average by 8%, while its gap with the OECD has closed to just 31% below the average in 2007. The region has been quite successful during the transition to an open market economy and accession to the EU. It has modernised its agricultural sector but experienced its largest productivity gains in industry.
  - The region's largest sector is services, employing around half of the workforce and adding 60% of GVA, followed by industry with 27% (27% of GVA), agriculture with 6% (16% of GVA) and finally construction with 6% (7% of GVA). Services are the most productive, 23% more productive than the average for the region), followed by industry (15% above average), construction (7% below average) and agriculture (68% below average). Industry has seen the largest productivity gains, increasing by 2.15 percentage points), compared to construction (2 pp), services (1.7 pp) and agriculture (0.67 pp). Although agriculture saw the lowest productivity gains compared to other Polish regions, it has maintained its competitiveness. As shown by the development of such companies as Mróz, Duda, or Farmutil, which have entered foreign markets in a difficult and competitive time.

  - Industry in the region is dominated by food and beverage production with motor vehicle manufacturing, pharmacy, furniture making, lighting and house appliances, ceramics and glass, plastics for the construction industry, and the rubber industry developing. Equally important as the above industries are brown coal mining, the metallurgical industry, and the energy production. Exports are dominated by the automotive, furniture, electric, pharmaceutical, and metallurgical industries. In recent years, service sectors such as IT, other business services, transport and tourism, and the construction industry have become more important. A recent survey of economic experts underlined that key sectors for the region were ICT, biotechnology, pharmaceuticals, chemicals and logistics. The latter is due to the region's convenient location, storage facilities (the Poznań market makes up 16% of the national market), its numerous logistical centres and the business process outsourcing (BPO) industry.

- **Labour market performance in the region is mixed** with the second lowest pre-crisis unemployment rate in Poland at 6.1% compared to the national average of 7.3% and the OECD average of 6.3%. Youth unemployment at 12.7% was significantly lower than in for the Polish and OECD TL2 regions at 17.7% and 15.3% respectively. In contrast, employment rates, at 53.5%, were lower than the Polish average of 57.7% and significantly lower than the OECD TL2 rate of 66.7%. More worryingly, employment rates have fallen by 4.7 percentage points over the period 1999-2008, at a time when in Poland as a whole they increased by 1 pp and in the OECD by 1.9 pp. The combination of low employment and low unemployment rates could reflect the adequate level of development of the regional economy and the good shape of the regional labour market, or it could be related to the demographic structure of population, which is shaped by inflows of young people coming to Poznan for their education.

- **Human capital remains an area of concern despite recent improvement.** Just 7.5% of the region's workforce is classed as low skilled – having only primary education – lower than the Polish rate of 9.3% and the OECD TL2 average of 27%. In contrast the region's proportion of highly skilled workers, at 21%, is still slightly below the Polish rate of 23% and the OECD average of 26% despite increases of 9 percentage points between 1999 and 2008, at a time when the proportion stayed the same among Polish regions and only increased by 5.8 percentage points in the OECD regions. This rise was due to: *i*) an increasing number of Polish and foreign firms locating their headquarters or branches to Wielkopolskie; *ii*) the rising number of university graduates from institutions in Poznan and other regional centres; *iii*) the rising number of small, often one-person, firms being established by highly skilled and entrepreneurial graduates. Poznan is one of the most important academic centres in Poland and also an attractive city with metropolitan ambitions bringing in students from other parts of the region and the country. After graduation, these students stay to seek jobs locally. This has been recognised by the regional authorities, who support the development of higher education and the R&D sector via the Regional Operational Programme (ROP).

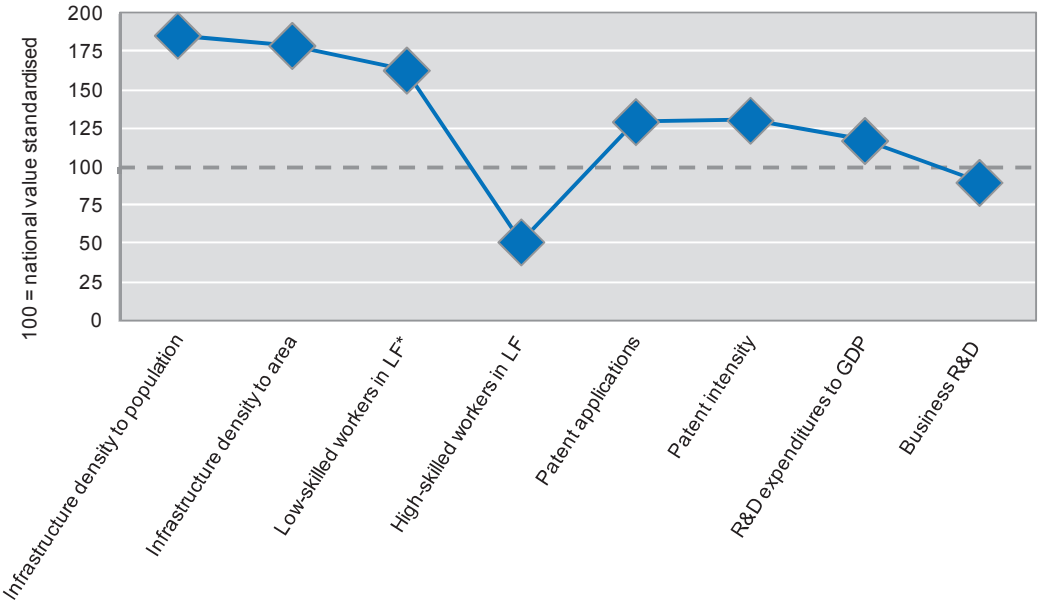
- **Infrastructure is above national standards** providing the region with good external connections. In 2008, motorway density – measured by motorway kilometres per person – was 0.06, more than three times Polish average of 0.02, albeit still much lower than the OECD average of 0.20. In relation to its land area, the region's motorway density (6.54) also surpasses national rates of 2.45. The region enjoys adequate road and rail connections facilitating connections between east and west. The region's capital, Poznań, is home to Ławica International Airport, which is the sixth largest

airport in Poland. The airport is currently under reconstruction in preparation for the Euro 2012 football championships, after which it will have a capacity of 3 000 000 passengers per year, against its current capacity of 1 500 000. In recent years the airport has recorded the second highest passenger growth rate in the country, from 192 398 passengers in 1998 to 1.3 million passengers in 2008 and 1.4 million in 2010. Future plans for infrastructure development include a high speed train connecting Poznan to Berlin.

- **Innovation activity is above national rates,** recording 10 patent applications in 2007 compared to the Polish average of 6.7 (but considerably below the average value of 430 in all OECD TL2 regions). Patent intensity at 2.9 was only slightly above the national average value of 2.3 and significantly below the OECD average value of 85.6. R&D expenditure was 0.27% of GDP, above the national value of 0.40% but significantly below typical OECD TL2 expenditure of 1.55%. Private sector R&D expenditure is slightly below the national average and one-eighth of the typical involvement of the private sector in OECD TL2 regions (Table 3.21). The public sector rate is higher, at 0.17%, than the Polish rate of 0.15%, but below the OECD average of 0.25%. The region is making important gains in this area creating its first regional innovation strategy in 2002-04, and its new regional innovation system in 2008.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.40 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region has adequate infrastructure, low levels of low-skilled labour in its workforce and relatively good innovation. A key challenge in the regions lies in improving the proportion of highly skilled workers in the workforce.

Figure 3.40. **How drivers of growth compare to the national average, Wielkopolskie, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Key elements of growth and development

A number of factors have influenced the performance of the region.

- **Favourable geographic location**. Wielkopolskie's proximity to western markets, particularly Germany, has been a key factor attracting foreign direct investment (FDI) with the region receiving the third largest amount of capital investments in Poland, boosting the performance of the region during the transition period. Wielkopolskie's central location in the country also makes it an attractive location for a number of different functions and activities.

- **Differentiated economic base.** Wielkopolskie inherited a multi-sectoral economy in 1990. Historically the region has been relatively well-developed in comparison to other parts of Poland. It has few declining sectors and a large share of its economy consists of small- and medium-sized enterprises, which are flexible and able to adjust to changing development conditions, both external and internal.

- **Attractive business environment.** The region has a long industrial tradition and a proactive approach to changes in its economy. It has established numerous institutions directly or indirectly supporting economic development. These institutions were needed to support entrepreneurship, absorb business initiatives, stimulate new ones, and create new business opportunities. Together with the region's good technical infrastructure and human capital, these institutions have created a favourable business environment.

- **Favourable social determinants for economic development**. The people of Wielkopolskie are well known for their strong work ethic, co-operative spirit and their tradition of social self-organisation. These form one of the pre-conditions for the creation of social capital. Its inhabitants have a strong regional identity and the social environment is encouraging to those who want to locate their business activities in the region. These traditions and social values were translated into concrete actions at the beginning of the transition period, when there was institutional leadership fomenting a spirit of co-operation between different stakeholders within the region. Such initiatives helped the region adapt to the changing conditions. For example, in 1991 they formed the Association of Municipalities and Counties of the Wielkopolska Region which now has a membership of 104 municipalities and 13 counties. The city of Poznan and regional authorities are proactive in looking for joint solutions to new problems and challenges. In February 2011 Poznan and its surrounding municipalities established the Association Poznan Metropolis, which serves to facilitate co-operation among local governments especially in the areas of spatial planning and economic development.

- **Internationalisation of regional economy**. The influx of significant foreign resources into the region has given local enterprises the opportunity to establish business contacts with foreign partners, and compete on international markets. The most significant foreign capital investments occurred in the automotive, food, chemical, pharmaceutical, and paper processing industries, typography, and the production of machines and devices (including electrical devices). The major foreign investors come from Germany: Beiersdorf AG (cosmetics), Bahlsen (food), Reemtsma AG (tobacco products), Volkswagen (cars), and MAN (buses); the United Kingdom: GlaxoSmith Kline (pharmaceuticals); the USA: the Wrigley Company (food), Kraft Foods (food), and Exide (car batteries); Japan: Bridgestone (car tyres) and Matsushita (electric batteries); the Netherlands: Philips Engineering (production and logistics centre); and from Switzerland: Nestle (food). The benefits of having big foreign corporations locate in the region go far beyond capital inflow and job creation. Foreign investment has integrated Wielkopolskie into the international economy. The "demonstration effect" has shown that the region is attractive to investors, improving the perception of the region among other potential investors.

- **Adequate infrastructure facilities with good external connections**. Wielkopolskie's relatively high motorway density and its adequate road and rail network facilitate connections between east and west. Transport infrastructure development is one of the Regional Operational Programme's priorities. Current and future projects will improve the accessibility and connectivity of the region to European and other international markets. The expansion of smaller-scale transportation networks is equally important since the system does not evenly serve the whole region and these are also covered by the Regional Operational Programme.

- **Supportive institutional arrangements.** Wielkopolskie has shown the importance of local institutional capacity and approach to guiding the regional development processes. The regional authorities have the potential to prepare appropriate regional development strategies, programmes and projects to achieve their goals and to build social partnerships facilitating communication and co-operation among interested parties.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire and the results our own analysis (summarised in Table 3.21).

- **Uneven development of transport infrastructure.** The physical accessibility of some parts of the region is still a problem. There are regional peripheries poorly connected with Poznan, the Poznan metropolitan area and other parts of the region. These areas are relatively poorly integrated, which has an impact on the overall performance of the region. This will require prompt intervention.

- **Limited investment resources.** For many years both old and newly established firms have found it hard to get hold of capital. The problem is especially visible in Wielkopolskie because of its dynamic development and rapid establishment of new firms. It is estimated that around 70% of small and medium enterprises (SMEs) do not have access to finance. This problem is not unique to Wielkopolskie and results from Poland's history of having a centrally planned economy. With a few exceptions, firms established or privatised since 1990 have not had the opportunity to generate enough capital for investments.

- **Low funding for and limited application of R&D**. Although the region shows innovative activity, the use of its scientific and research potential remains limited. Mechanisms to encourage the transfer of knowledge from R&D facilities to the business sector are weak. Expenditures on R&D is low, especially on the part of the private sector. Despite this, the region is making some advances in this area, for example establishing incubators that bring together research and business activities, or opening technological parks.

- **An inflexible education system which does not meet the region's needs**, alongside little awareness of the need for investment in human resources. The creation and efficient utilisation of human capital is a key element in fostering economic development. However, in Wielkopolskie, the number and professional skills of its graduates does not match the needs of the labour market, creating problems for both entrepreneurs who cannot find the right employees and graduates who cannot find jobs. This creates social and economic problems and hinders the process of development.

- **Slowing pace of modernisation.** Despite favourable development conditions, the R&D potential of the region and the presence of many firms that use new technologies, there are still a large number of traditional sectors in the regional economy. These need to gradually modernise, increasing their value-added activities and enhancing innovation. This will entail changing their embedded risk-averse mentality, improving the links between the private sector and the research community, s and strengthening links between large innovative firms and SMEs.

- **Inefficient development policies.** Among other means, regional authorities provide support to firms via two popular instruments whose efficiency has been questioned: special economic zones and clusters. Data gathered during last year shows that clusters often cannot survive without the permanent support from outside. If so, policies supporting entrepreneurship and entrepreneurs ought to be revised and adjusted to real life conditions.

Table 3.21. **Statistical summary, Wielkopolskie**

	Period	Wielkopolskie	Poland	OECD	National gap	OECD gap
Levels						
GDP pc	1995	7 916	8 048	18 926	98%	42%
	2007	14 636	14 004	24 597	105%	60%
GDP	2007	49 508	310 628			
GDP share	1995	9.27%	n.a.			
Productivity	1998	24 605	19 660	44 513	125%	55%
	2007	37 746	35 027	54 713	108%	69%
Area (in km^2)		29 826	312 685			
Area share of national		9.54%				
Population	2008	3 386 882	38 115 641	3 481 456		
Population share	2008	8.89%	n.a.	n.a.		
Population density	2008	112	122	263		
Elderly dependency ratio	2008	17%	19%	21%		
Youth dependency ratio	2008	23%	22%	28%		
Motorway density (p)	2008	0.06	0.02	0.20		
Motorway density (a)	2008	6.54	2.45	21.91		
Primary attainment % LF	2008	7.2%	9.3%	27.4%		
Tertiary attainment % LF	2008	21.1%	22.9%	26.0%		
Unemployment rate	2008	6.1	7.3	6.3	-1.24	-0.2
Employment rate	2008	53.5	57.7	66.7	-4.22	-13.2
Long-term unemployment	2008	2.84	2.5	2.4	0.35	0.5
Youth unemployment	2008	12.7	17.7	15.3	-4.97	-2.6
Patent applications	2007	9.97	6.7	430.0		
Patents per million	2007	2.9	2.3	85.6		
R&D to GDP	2005	0.47%	0.40%	1.55%		
BERD to GDP	2005	0.12%	0.13%	0.93%		
GERD to GDP	2004	0.17%	0.15%	0.25%		
Changes						
GDP pc growth	1995-2007	5.25%	4.72%	2.2%		
GDP growth	1995-2007	5.40%	4.62%	2.8%		
Productivity growth	1998-2007	4.87%	6.63%	1.83%		
Population growth	1995-2008	0.13%	-0.10%	0.6%		
WA population growth	1995-2008	0.87%	0.48%	0.8%		
Elderly dependency (pp change)	1995-2008	0.29	0.02	2.50		
Youth dependency (pp change)	1995-2008	-14.04	-0.14	-6.28		
Primary education (pp change)	1999-2008	-7.21	-7.51	-6.09		
Tertiary education (pp change)	1999-2008	9.01	10.15	5.84		
Employment rate (pp change)	1999-2008	-4.77	1.04	1.87		
Unemployment rate (pp change)	1999-2008	-3.68	-5.71	-1.82		
Patents per million (pp change)	1995-2007	2.80	1.61	53.29		
R&D to GDP (pp change)	2000-2005	-0.02	-0.05	0.13		

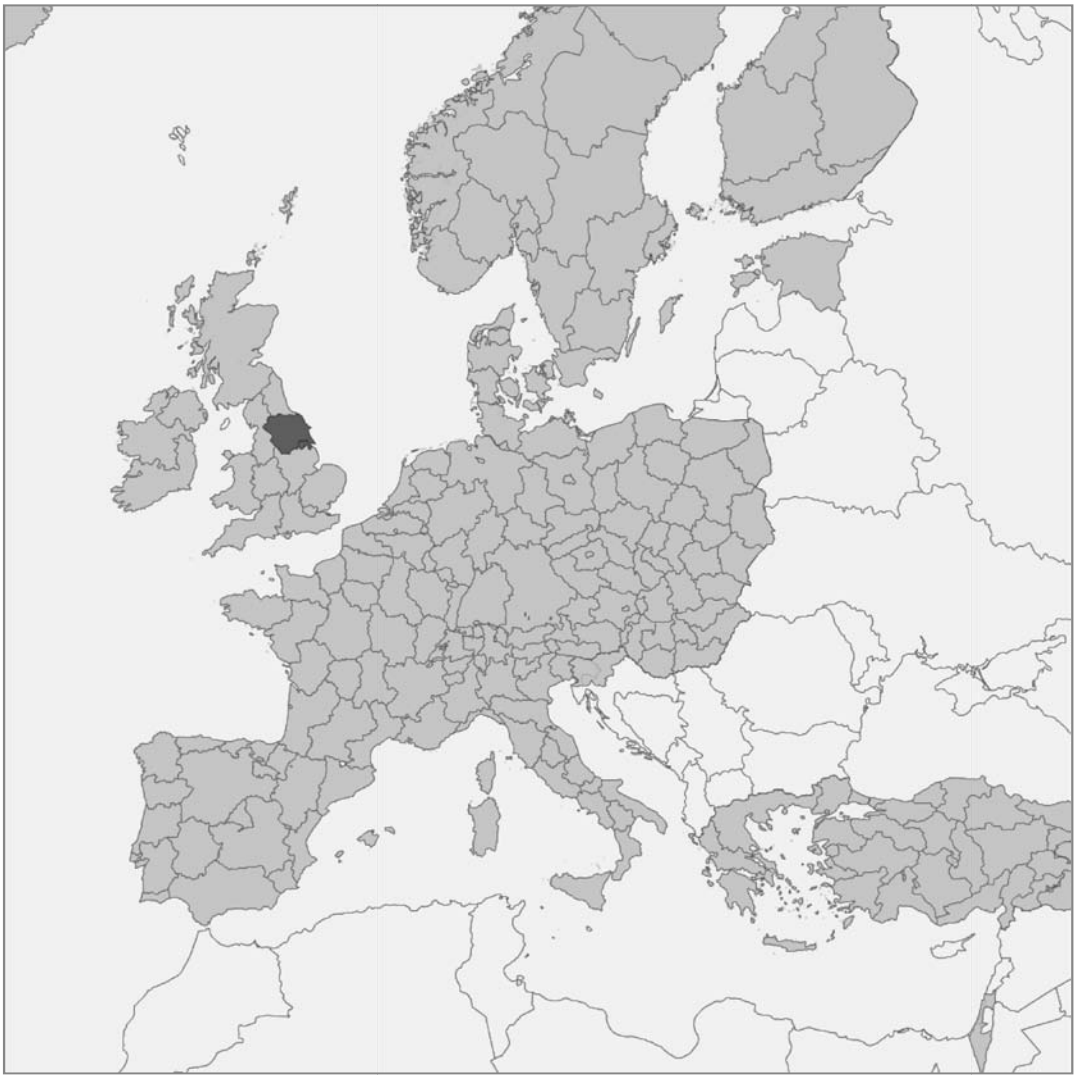
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Yorkshire and Humberside (Leeds), United Kingdom

Figure 3.41. **Yorkshire and Humberside (Leeds), United Kingdom**

Regional category: Catching-up potential and growing below the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

This case study concentrates particularly on the functional area defined as the Leeds city region (LCR), given that sub-national economic policy making in the UK focuses on this level since the decision of the current government to abolish the regional tier which existed at the time this case study was undertaken. The Leeds city region is the economic heart of the Yorkshire and Humberside region and includes all or part of ten local authority areas (Leeds, Bradford, Calderdale, Kirklees, Wakefield, Selby, York, Barnsley, Harrogate and Craven). These areas are administered by 11 local authorities

(the District and Unitary Councils responsible for the above areas plus North Yorkshire County Council. The LCR corresponds broadly to five of the ten TL3 regions, excluding Kingston upon Hull, the East Riding of Yorkshire, North and North East Lincolnshire, the rural parts of North Yorkshire, and most of Sheffield. However, the Leeds city region economic area extends to include Harrogate, Selby and parts of Craven in North Yorkshire, and parts of Barnsley.

In 2007, Yorkshire and Humberside had a population of 5.2 million, around 8.5% of the UK population. Its population density, at 322 people per km^2, is higher than the average for England (395), the UK (250) and the OECD TL2 regions (263). The LCR has a population of just over 2.9 million, 58% of the population of Yorkshire and Humberside and is relatively densely populated at 511 people per km^2. There are particular concentrations of population in Leeds and Bradford with densities of 1 396 and 1 371 people per km^2 respectively (UK Office for National Statistics, 2008b). Yorkshire and Humberside is located in the northern part of England, neighbouring the North East TL2 region to its north, the North West to its west, the East Midlands to its south and the North Sea to its east.

The LCR is fairly polycentric, with the largest cities and urban centres including Leeds with 798 800 inhabitants, Bradford (293 717), York (202 400), Huddersfield (146 234), Halifax (82 056), Wakefield (76 886), Barnsley (71 599) and Harrogate (71 594). Settlement patterns beyond these urban centres include a distinctive mix of urban and rural areas in close proximity to attractive open land. The rural element of the LCR economy accounts for nearly half of the region's rural economy. Despite the region's remoteness from core EU markets, its distance to London – and therefore core markets in the UK – is not excessive, and furthermore Leeds is well positioned in the national transport network offering access by both road and rail to key economic centres, including mainline rail to London and Manchester and key motorway links. Analysis of travel times to a basket of other places including other northern cities, London, Edinburgh and Glasgow, places Leeds as the most accessible city in the north by both rail and road, and York, which is also part of Leeds City Region, as the second most accessible by rail, ahead of Manchester (IPEG and CUPS, 2008).

The LCR has experienced significant shocks to its productive structure in recent decades. As with other northern UK regions, the LCR has been experiencing a long-term restructuring process. The region was a key hub of the industrial revolution as a cradle of the textile, coal and mining industries. It suffered a dramatic decline in these traditional industries during the 1980s leading to a realignment of its productive base into new sectors. A second important element was the wave of financial deregulation during the 1980s and particularly the 1990s which spurred rapid growth and integration of the UK's financial, business and services sector. This had a profound effect in the LCR, which evolved into an important centre for financial, legal and retail activities at a time when the region's traditional financial institutions have been absorbed into larger groups.

As with other parts of the UK, the region has been affected by ongoing institutional instability**.** The recent abolition of Regional Development Agencies operating at TL2 level, and the creation of Local Enterprise Partnerships (LEP) to work at the "functional economy" level is the latest change to the structures of sub-national governance. Whilst the role and competencies for LEPs are still being determined, a number of resources and powers previously held by RDAs have been centralised to central government departments. The geography of the LEP represents continuity for Leeds to some extent,

as it builds on the collaborative structures established in November 2004 by the local authorities to work together on economic and spatial development priorities. Key developments at the LCR level since then include the agreement of the City Region Development Programme (CRDP) in September 2006 and the formation of the City Region Leaders Board in 2007 to lead collaborative decision making across the area. A first wave Multi Area Agreements was created in July 2008 and, along with Greater Manchester, the city region was granted national pilot city region forerunner status in November 2009, steps towards the devolution of sub-national economic policy making.

Economic assessment

The taxonomy classifies Yorkshire and Humberside as region with catching-up potential, growing below the national average. In 1995 its GDP *per capita* was USD 19 907 in PPP, around 11% lower than the national average, and 5% more than the OECD average. Over the period 1995-2007, GDP *per capita* grew at a rate of 2.0%, below both the national rate of 2.53%, and the OECD rate of 2.2%. Consequently the gap in GDP *per capita* widened over this period to 17% below the national value and ended only 2% above the OECD average value. GDP overall grew at 2.3% in Yorkshire and Humberside, below the pace of growth nationally of 2.9% and OECD TL2 rate of 2.8%. GDP output in the functional LCR amounted to GBP 46.4 billion in 2007, contributing around 56% of the region's total GDP.

Population in the region has increased by on average 0.33% since 1995, slightly below the growth in the UK regions of 0.35% and in the OECD TL2 regions of 0.6%. In the LCR the population has grown at a rate of 4.7% since 2001, faster than in the larger region (4.0%) and in England (3.3%). The fastest growing local authority areas within the city region include York, Leeds and Bradford.

Below we summarise how the region performs compared to national and OECD averages for five key indicators. Figure 3.42 summarises its performance against the national average.

- **Productivity is lagging.** In 1995, productivity – measured by GDP per employee – stood at 43 975 in Yorkshire and Humberside, trailing the national average by 9% and standing at around the average for OECD TL2 regions. Productivity growth, at 1.68%, has been inferior to national rates of 2.23% and OECD rates of 1.83%, widening the gap to 15% below the national average and 2% below the OECD average. Within the LCR, estimates of productivity levels also remain lower than the national average, with an output per resident of GBP 16 039 in 2007 compared to a UK figure of GBP 18 164 (Leeds City Region, 2010).[26] Output *per capita* in the LCR grew marginally above the regional pace of growth over 1998-2007 with considerable variation between the different local authorities within the LCR. Leeds recorded the highest figures (GBP 18 824.5), around 65% higher than the lowest, Barnsley (GBP 7 428.2). Wakefield recorded the highest growth overall (Leeds City Region, 2010).
  - The widening of the productivity gap is largely influenced by the ongoing profound structural change in the UK and the repositioning of key economic roles in the LCR. The region is switching from traditional declining manufacturing sectors to new manufacturing activities including the production of non-metallic mineral products; pulp and paper products and printing; and timber, rubber and plastic. Manufacturing is prevalent in

Kirklees, Selby, Bradford and Barnsley. More importantly, the LCR has successfully diversified its productive base from traditional industry to become more service-sector oriented, particularly in sectors such as banking, finance, insurance and retail. The service sectors are most concentrated in Leeds and represent the most important service sector in the UK outside the London area, with secondary centres spread around the city region in places like York and Halifax. In 2006, it was estimated that services employed 243 000 people in the LCR with 100 000 in the city of Leeds, and growth in other centres in the city region. The sector generated about 25% of the LCR's total GVA. The number of businesses in the banking, finance and insurance sector went up 7.1% between 1998 and 2007 and this resulted in a net increase in employment of 67 500 jobs.

  - In contrast manufacturing industries experienced losses in both numbers of businesses and employment. Between 1998 and 2007 there was a decline of over 1 100 manufacturing businesses (12% of the total) leading to a decline of the number of jobs by 57 500 or 25%. Other sectors such as transport and communications remained largely stable in terms of the numbers of businesses, with a small increase of employment levels of 8 000. Outside services, the main growth in employment occurred in public administration, education and health experiencing an increase of 65 400 jobs (23%). There was also growth of 18 000 jobs in distribution, hotels and restaurants (6.5%).

- **Labour market performance slightly trails the national average** with pre-crisis unemployment rates of 6.1% and youth unemployment rates of 15.3% in 2008, both around 0.4 percentage points above the national average. Long-term unemployment is also slightly higher (0.1 pp) and the employment rate of 70.6% is slightly below the national average of 71.5%. Employment rates increased 2.12 percentage points over 1995-2008, slightly lower than the national average gain of 2.33 pp and the declines in unemployment of 0.5 pp were also lower than the national average. The city region has done slightly better than the wider region with an employment rate in 2007 of 73.7% compared to 73.2% for Yorkshire and Humberside.

- **Human capital has been falling behind in recent years**. The proportion of highly skilled workers in the labour force has increased more than nationally in recent years but in 2008 its share, 31.5%, still remains below the average level in UK regions of 34.6%, but above the OECD average of 26%. The region also has a slightly higher proportion of low-skilled workers in its workforce (22.7%) than nationally, but still less than among OECD TL2 regions. In recent years however the proportion of low-skilled workers has increased by a full 6.7 percentage points at a time when it has remained unchanged among UK regions and has decreased by 6.2% in OECD TL2 regions. In 2007, 14.3% of the region's working age population had no qualifications. Whilst this has improved since 1999, when the proportion was 16.8%, it has fallen behind the rest of the country which fell from 16.5% to 12.9% over the same period.

  - The LCR has a similar unqualified proportion of the working age population (14.5%) as the wider region and is falling behind in intermediate and higher level skills. In 2007 62.1% of the working-age population had achieved National Vocational Qualification (NVQ) level 2, up from 57.7% in 1999 while Yorkshire and Humberside had 61.3%, up from 56.0% in 1999.

For England as a whole the figures were 64.1% up from 57.7% in 1999. At NVQ level 4, the proportions were 25.3% (21.3% in 1999) in the LCR, 23.8% in Yorkshire and Humberside, (19.5% in 1999), and 28.3% for England as a whole (22.4% in 1999).

- **Road infrastructure exceeds national standards but remains below OECD levels**. In 2008, motorway density – measured by kilometres of motorway to its population – stood at 0.07 for the region, slightly above the average value of UK regions of 0.05 but less than half the average value in OECD regions of 0.20. Whilst the connectivity between Leeds and Manchester is good, speed is a continuing problem for economic activity levels in both cities with congestion and unreliability on both the road and rail network. This problem is the focus of a number of proposals for network improvement, including the Northern Hub which will address congestion around Manchester and therefore increase access to international transport connectivity for Leeds, and planned investment to speed up commuting between Leeds and Manchester, to seek to gain significant economic benefits from stronger integration of the two labour markets, which one study estimated to be worth GBP 6.7 billion to the economy.[27]

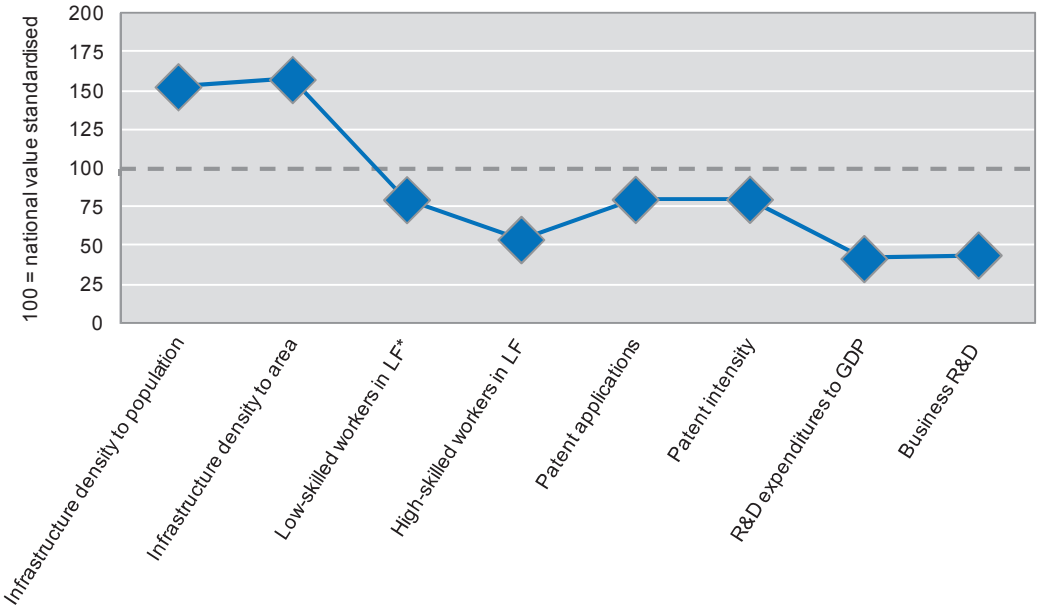
  - The growth of the LCR has placed significant pressures on the transport network within the city region, as more people commute longer distances (Leeds City Region (2010). Roads are more congested than in 1990 and there is little spare capacity with most corridors affected during the peak periods. Similar trends exist on rail into Leeds, which also suffers from poor and out-of-date rolling stock. In contrast, there is significant spare capacity available on the bus network, which is affected by slow and unreliable journey times. Lack of integrated ticketing and poor quality interchanges cause further problems. Demand for transport services that connect the LCR with other city regions and national centres continues to increase. For passenger services, the main road and rail connections are south to London and Sheffield and Wakefield and across the Pennines to Manchester, including to Manchester Airport. There is considerable scope to strengthen these linkages in terms of speed, frequency and capacity, to help deliver agglomeration benefits and economic growth. For haulage, a key link is to the Hull and Humber Ports via rail and road to support Leeds' retail and logistics sectors, and these continue to need attention.

- **Innovation activity in the region remains below national and OECD standards**. Yorkshire and Humberside has fewer overall patent applications (408.9) in 2007 than the UK (505.2) and OECD TL2 (430) averages. In relation to its population, patent intensity is also slightly lower at 79 patent applications per million inhabitants, than the national average of 90.2 and the OECD average of 85.6. The share of R&D expenditure is 0.91% of GDP, almost half the national share of 1.62% and the OECD average of 1.55%. The private sector spends more in R&D activities than the public sector although in both there is room to expand. The share of business R&D to GDP is 0.39%, almost one-quarter the national average of 1.01% and less than half the OECD average of 0.93%. Public sector R&D expenditure is just 0.05% of GDP, significantly lower than the average in UK regions and less than one-fifth the public sector share in OECD regions.

– The city region has a large electrical and optical equipment sector, 70% of which is concentrated in the Airedale Corridor, the preferred location for key clusters. The Advanced Digital Institute is the corridor's flagship project. The LCR is home to eight higher education institutions (HEIs) producing more than 36 000 graduates each year. This is fuelling the growth of knowledge-intensive companies in sectors such as environmental sciences, bioscience, health and medical research, and the digital and creative industries. Science City York is the most successful project of its kind in the UK. The digital and creative industries are seen as a future opportunity for the city, building on a range of existing assets and incubation hubs. The decision to relocate some key BBC operations to Salford in Manchester City Region is perceived as a major opportunity in this sector.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Looking at the picture for Yorkshire and Humberside as a whole (Figure 3.42), reveals the region has adequate levels of infrastructure (with good connections to London), but below average levels of both human capital, and innovation intensity. A key challenge for the region is in improving the participation of the private sector in innovation activities. The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (summarised in Table 3.22).

Figure 3.42. **How drivers of growth compare to the national average, Yorkshire and Humberside (Leeds), 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of both the Leeds city region and the wider Yorkshire and Humberside region.

- **A strong private sector has helped diversify the economy.** LCR is the home to an estimated 70 000 private businesses.[28] Whilst there has been strong growth in public sector employment over recent years, there were roughly four net additional jobs in the private sector for every job created in the public sector in the LCR between 2003 and 2008, a similar proportion to that in evidence nationally. In the larger Yorkshire and Humberside region overall the proportion of private to public jobs growth was much lower at two to one.

- **A relatively diversified economic structure** has been an important driver of growth in the city region. The development of a highly competitive cluster in financial services and insurance capable of competing in world markets, growth in public sector employment and relative stability in other sectors such as construction and distribution, has, on aggregate, enabled the area to be successful. Manufacturing remains important in textiles and engineering, retail and food processing, and a surging medical industry which has remained consistently competitive by building capabilities and resources in new product development, although the overall importance of these sectors has declined in terms of both growth and employment.

- **Critical mass in human capital** due to a notable concentration of higher education institutions – one of the largest groupings in Europe. Two universities appear in The Times HES/ QES Top 100 World University rankings. In addition, the LCR has nine sector-specific Centres of Industrial Collaboration (CICs), two of the FT's World Top 100 Business Schools and Science City York. More broadly, LCR has a large and diverse workforce of 1.4 million.

- **A central geographic location** has played an important role in the region's development. It has good access to ports on the east coast, with the logistics sector linked to the port at Hull. It has rail and road links to other parts of the regional and national economy including mainline connections to London from both Leeds and York. It has access to a number of airports, including the globally linked hub in Manchester.

- **The largest city region outside London.** The presence of a polycentric urban structure and well-connected rural territories offers a wide range of distinctive living environments and a diverse offer for both residential and business purposes. In addition it provides a gateway to a number of historic sites and rural landscapes, making it attractive to visitors.

Main bottlenecks for growth and development

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended side-effects stemming from isolated sectoral interventions (OECD, 2009a).

- **Internal connectivity needs improvement.** Although the LCR enjoys relatively good connections to London, internal connections and those to other city regions, in particular Manchester and Sheffield, and across the wider regional territory could be improved for both passenger and freight. Internal connectivity is critical to Leeds's polycentric functional labour market. In particular, the connectivity between York and the remaining larger functional area needs to be improved. There is also a continuing, as yet unfulfilled, dialogue about the potential of stronger integration between the relatively close economies of Leeds, Manchester and Sheffield (Overman *et. al.*, 2009). with evidence showing that stronger linkages could be beneficial to the LCR, and the regional and national economies. Stronger and more established local leadership would need to be established before this issue could be fully progressed.

- **Lack of effective mobilisation of all key stakeholders** was perceived to be an important barrier to growth. The region's ability to pull everybody together is affected by its polycentricity, geographical dispersion and institutional complexity, with a large number of Unitary and District Authorities covered by the LCR territory. These factors have made it harder to generate effective communication, strong co-ordination and a common sense of purpose. The relatively new strategies and structures, including the new public-private Local Enterprise Partnership (LEP), mean the LCR has some way to go towards achieving its full potential. The recently published LEP plan aims to address these bottlenecks by aiming to improve co-ordination and align priorities, but it will require strong focus to secure delivery.

- **Labour market capacity and skills**. Whilst the city region has been successful in making the transition from a predominantly industrial to a more diverse economy there remain challenges in key urban areas including the key towns and cities on the south and west of the city region in terms of labour market participation, skills and levels of economic activity within these places. A focus on the skills of the resident population combined with the continuing development of the housing market in places like Wakefield and Bradford would add to the economic capacity of the wider functional economy. This would be supported by the continuing steps to improve the transport connectivity of the area mentioned above.

- **Although its economy has size and scale, the city region lacks market awareness**. The LCR exists within a strong and historically important county, Yorkshire, and has yet to achieve the global and national recognition of equivalent city region economies such as Manchester and Barcelona. Further work to define its strength and what it offers to a range of audiences would boost its profile and attractiveness to a range of potential stakeholders ranging from highly skilled workers (including graduates), investors, and visitors for leisure, education or business.

Table 3.22. **Statistical summary, Yorkshire and Humberside (Leeds)**

	Period	Yorkshire and Humberside	United Kingdom	OECD	National gap	OECD gap
Levels						
GDP pc	1995	19 907	22 336	18 926	89%	105%
	2007	25 107	30 145	24 597	83%	102%
GDP	2007	129 990	1 296 729			
GDP share	1995	7.09%	n.a.			
Productivity	1995	43 975	48 295	44 513	91%	99%
	2007	53 735	62 926	54 713	85%	98%
Area (in km^2)		15 408	243 069			
Area share of national		6.34%				
Population	2007	5 159 800	60 781 334	3 481 456		
Population share	2007	8.49%	n.a	n.a		
Population density	2007	322	250	263		
Elderly dependency ratio	2007	24%	21%	21%		
Youth dependency ratio	2007	26%	27%	28%		
Motorway density (p)	2007	0.07	0.05	0.20		
Motorway density (a)	2008	24.89	13.67	21.91		
Primary attainment % LF	2008	22.7%	22.0%	27.4%		
Tertiary attainment % LF	2008	31.5%	34.6%	26.0%		
Unemployment rate	2008	6.1	5.7	6.3	0.40	-0.2
Employment rate	2007	70.6	71.5	66.7	-0.88	4.0
Long-term unemployment	2008	1.5	1.4	2.4	0.12	-0.9
Youth unemployment	2008	15.35	14.9	15.3	0.42	0.0
Patent applications	2007	408.89	505.2	430.0		
Patents per million	2007	79.0	90.2	85.6		
R&D to GDP	2005	0.91%	1.62%	1.55%		
BERD to GDP	2005	0.39%	1.01%	0.93%		
GERD to GDP	2005	0.05%	0.16%	0.25%		
Changes						
GDP pc growth	1995-2007	1.95%	2.53%	2.2%		
GDP growth	1995-2007	2.32%	2.92%	2.8%		
Productivity growth	1995-2007	1.68%	2.23%	1.83%		
Population growth	1995-2007	0.33%	0.35%	0.6%		
WA population growth	1995-2008	0.59%	0.60%	0.8%		
Elderly dependency (pp change)	1995-2007	-0.69	-0.03	2.50		
Youth dependency (pp change)	1995-2007	-4.16	-0.04	-6.28		
Primary education (pp change)	1999-2008	6.73	6.18	-6.09		
Tertiary education (pp change)	1999-2008	5.34	5.29	5.84		
Employment rate (pp change)	1999-2007	2.12	2.33	1.87		
Unemployment rate (pp change)	1999-2008	-0.50	-0.69	-1.82		
Patents per million (pp change)	1995-2007	40.06	41.12	53.29		
R&D to GDP (pp change)	1995-2005	-0.05	-0.15	0.13		

Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Zacatecas, Mexico

Figure 3.43. **Zacatecas, Mexico**

Regional category: Catching-up potential and growing below the national average

Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.
Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Zacatecas encompasses nine smaller TL3 regions consisting of 58 municipal units. Its population in 2008 was 1.38 million, rising to 1.49 million by 2010, representing 1.29% of the Mexican population. The region's population density is 18 people per km^2, lower than the average for Mexican regions of 54. It is located in the north-central part of Mexico, with Durango to the northwest, Coahuila to the north, Nayarit to the west, San Luis Potosi and Nuevo Leon to the east, and Jalisco, Guanajuato and Aguascalientes to the south. The largest cities are Fresnillo, with 213 139 inhabitants in 2010 followed by Guadalupe with 159 991 and the capital city, Zacatecas, with 138 176. All three are located no more than 70km apart with Zacatecas and Guadalupe effectively integrated into a single metropolitan area called Zacatecas-Guadalupe with a population of 298 167 in 2010. The three cities, which enjoy strong linkages and close

ties, are home of about 37% of the region's population. The region's geographic characteristics are quite mixed, with the Eastern Sierra Madre characterised by elevations over 2 500 meters above sea level, and the area known as Altiplanicie or Central Meseta having semi-desert characteristics.

Although Mexico has experienced two significant shocks to its economy in recent decades – the ending of the import substitution model during the late 1980s and early 1990s and the signing of the NAFTA treaty in 1994 – these did not have a notable impact on the region. Despite being relatively centrally located in Mexico, Zacatecas is relatively far from the northern borders.

Mexico is a federal state with a two-tier system of sub-national government comprising of 31 states and 1 federal district (Mexico City) at the regional level and of 2412 municipalities at the local level. Although Mexico is a federal country, its policy making remains quite centralised. Since the 1990s there has been a gradual devolution to the states and municipalities but sectoral policies are largely designed at the federal government level, making co-ordination with lower levels of government a challenge. In the absence of effective co-ordination mechanisms, both between different levels of government and across sectors, policy making at the regional and local scale in Mexico is highly fragmented, making it hard to design strategies and policies tailored to local needs.

Economic assessment

The taxonomy classifies Zacatecas as a region with catching-up potential, growing below the national average. In 1995, its GDP *per capita* was 3 967 USD in PPP, around 42% below the Mexican average and 79% below the OECD average in TL2 regions. Over the period 1995-2008, GDP *per capita* grew at a rate of 2%, below the national rate of growth of 2.08% and the average for OECD TL2 regions of 2.2%. Consequently the gap has widened further over this period to 43% below the national average and 80% below the OECD average. Population in the region increased by only 0.18% compared to an average increase in Mexican regions of 1.17% and in the OECD of 0.6%. This slower population growth can be explained by the heavy outflow of migrants affecting the fertility rate. In 2005 Zacatecas ranked 9th among Mexican regions as a region exporting people out of the country. GDP growth overall at 2.2% was below the national pace of growth of 3.3% and also below the growth rate in OECD TL2 regions 2.8%. In sum the region is lagging and the gap in GDP *per capita* would be even worse were it not for relative population decline.

Below we summarise how the region performed compared to national and OECD averages for five key indicators. Figure 3.44 summarises its performance against the national average.

- **Productivity growth is weak.** Productivity – measured by GDP per employee – stood at USD 12 142 in PPP in 1996, 36% below the national average and 73% below the OECD average. From 1996-2007, productivity in the region grew at a rate of 0.97%, below the average pace of growth of all Mexican regions of 1.38%, and of OECD TL2 regions of 1.83%. Consequently the region's productivity gap has increased to 38% below the national average and 75% below the OECD figure. This weak performance is closely related to the absence of industrial and high value-added activities in the region which in turn is due to the region's unfavourable geographic terrain and location. Zacatecas has been historically tied to the production of minerals (gold, silver, zinc, copper, lead and cadmium) providing an important source of employment for the inhabitants of the region's 15 mining districts. The region also has non-metallic minerals including gravel, kaolin, sand, clay, limestone, talc, calcite, salt, plaster, perlite and rock quarries. In 2008, the region had the third largest mining

sector (both metallic and non-metallic) among Mexican regions, producing 11.8% of the total national production, by 2010 its share had increased to 19.7% and it had moved into second place. The arid and semi-arid areas in the region occupy around three-quarters of the region's land area. Only 14% of the region is suitable for agricultural activity, 79% for livestock and 7% consists of non-timber forest. This lack of suitable terrain is an important bottleneck for productivity-enhancing economic activities.

  - The proportion of the workforce employed in services rose from 40.3% in 1995 to 49.5% in 2000, while the proportion of workers employed in the primary sector declined from 42.6% to 20.7% and the proportion in the secondary sector increased from 17.1% to 26.7%. The increase in secondary activities is due in part to the development of *maquiladora* manufacturing activities in the state, in the auto parts and clothing sectors. These activities have been concentrated mainly in the major urban centres of Zacatecas and Fresnillo but have also been scattered around other municipalities. In 2000, 72% of the workforce was male, with females making up only 28% and 78% of whom were working in the service sector.

- **Labour market outcomes resemble national levels**. The pre-crisis unemployment rate in Zacatecas in 2007 was 3.1%, almost identical to the national average of 3.0%. The employment rate in the region is 62.0%, slightly below the national rate of 63.1%, having increased by 1.59 percentage points over the period 1996-2007, less than the average in Mexican regions of 1.81 pp.

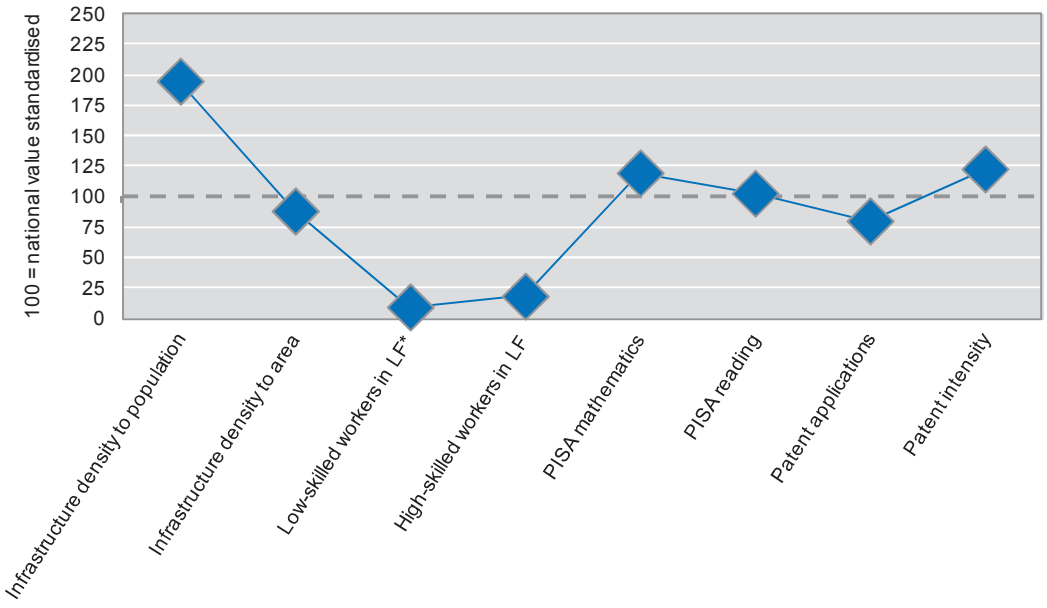
- **Human capital is quite low despite recent improvements**. Over the period 1995-2005 Zacatecas reduced the proportion of low-skilled workers in its labour force by 3.93 percentage points, and increased highly skilled by 1.43 pp. These gains were below national changes of 5.27 pp and 6.09 pp, respectively. Despite these improvements, 77.3% of the region's workforce is classed as low skilled and only 12.3% as highly skilled, a worse performance than the national figures. During the period under analysis, the school system in Zacatecas was considered to be one of the worst performing in the country. In terms of PISA scores however, the region's educational outcomes are around the national average in reading scores and above it in mathematical scores (Table 3.23). The government has given priority to increasing proficiency in English among the student population and to encourage certain specialties associated with information technology as a factor in attracting assembly activities of higher technological level.

- **Infrastructure in the region is mixed.** On the one hand infrastructure density – measured by kilometres of motorway to its population – is 8.3 in Zacatecas, above the average value of 3.22 for Mexican regions. On the other hand, in relation to its land area, motorway density was 152.45, below the average value of Mexican regions of 175.14. The metropolitan regions of Guadalupe, Zacatecas and Fresnillo are on a road and rail corridor linking Mexico City with Ciudad Juarez and the Western United States. However, this route has the greatest distance to reach densely populated urban areas and core markets in the US. The state government has sought to create a solid base of industrial infrastructure in the town of Calera, between Zacatecas and Fresnillo, near Zacatecas International Airport. As part of this priority, the federal government has been investing in projects to connect this area to the gas pipeline network.

- **Innovation activity is low but surpasses national levels in relation to population.** The region has 3.0 patent applications overall, less than the average for Mexican regions of 6.2 and for OECD TL2 regions at 430. Nonetheless, in relation to its population, patent intensity is higher, at 2.2 compared to the national average of 1.6 but very low in comparison with the OECD average in TL2 regions of 85.6.

Ensuring key drivers of growth are integrated and complement each other positively, is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Looking at the picture for Zacatecas as a whole (Figure 3.44), reveals the region is weak in levels of infrastructure in relation to its surface area and low level of human capital although the region surpasses national levels in PISA scores. The region enjoys high levels of innovation in relation to its population.

Figure 3.44. **How drivers of growth compare to the national average, Zacatecas, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced Zacatecas' performance:

- **Agriculture activity remains an important economic activity** in the region, making up a larger proportion of the economy than in other regions. The region is suitable for growing products such as beans, chillies, vines and other crops and livestock, providing important employment opportunities. The agriculture sector experienced an annual average growth rate of 4.5%.
- **Flows of remittances from migrants living outside of the region** inject a significant amount into the local and regional economy. Despite the positive impact of remittances their role in the medium and longer term is quite uncertain as they depend on external conditions. This was demonstrated recently with the global financial crisis and the return of many migrant workers back to the region.

- **The presence of minerals and mineral activities** has been a source of employment and economic activities in areas where few would exist otherwise. Because of its geological formation the history of Zacatecas has been closely linked to the production of precious metals (gold and silver) and mining is a significant source of employment.
- **The presence of an international airport** has been an important location factor for *maquiladora* activities with high added value such as that recently located in the state associated with the automotive and aerospace industries.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire as well as the results of our own analysis (Table 3.23).

- **Demographic effect of high levels of outmigration.** The population in the region is falling behind the rest of the country as it grows more slowly. Growth in its working age population was also lower, at 1.04%, than the national rate of 1.89%.The reduced population growth can be explained by the heavy outflow of migration and relative population decline has become a structural problem with the drop of fertility rates which further reduces population. The region has an elderly dependency ratio of 11% and a youth dependency ratio of 50%, both higher than nationally. The elderly dependency ratio has been increasing at a rate of 1.66%, faster than nationally, bringing higher current and future costs of service delivery, such as health care, assistance, homecare and transport.
- **Low levels of industrial activity focusing mainly on low-value added products.** The region has a relatively weak industrial production with few large and international firms. More than 98% of its manufacturing establishments are family-owned micro enterprises with no links to larger enterprises. The economy is dominated by mining, which is capital intensive and tends to have relatively low links to the local economy and to higher value-added activities. Further value-added activities, such as refining, are typically carried on outside of the region. During the period of analysis no cluster has been consolidated around the main activates of the region in mining, agriculture and livestock.
- **The modernisation of agriculture has been moderate.** Partly this is due to difficulties in attaining scale effects because of its terrain, outdated irrigation systems and limited application and use of modern technology in cultivation. The low level of human capital, high proportion of elderly people and large numbers of younger people leaving the region reduces the ability to apply technological improvements in this area. Farmers will need to improve and differentiate their products by fomenting activities to improve the quality and marketing of what they produce.
- **Poor educational levels and low availability of skilled workers** in the region. The school system in Zacatecas is considered as one of the lowest in the country. An evaluation carried out by the World Bank in 2006, highlighted that students in this region make a particularly poor use of education, due to trade union conflicts, inadequate basic infrastructure in the schools and insufficient financial resources, among other things. In terms of PISA scores however, the region's educational outcomes are not as low, scoring slightly higher mathematics scores (424 as opposed to the national average of 419) and reading scores (426 as opposed to the national average of 425).
- **Low participation of women in the workforce** with men forming 72% of the workforce in 2000 and women only 28%. Women were primarily employed in the service sector (78%).

Table 3.23. **Statistical summary, Zacatecas**

	Period	Zacatecas	Mexico	OECD	National gap	OECD gap
Levels						
GDP pc	1995	3 967	6 879	18 926	58%	21%
	2007	5 032	8 808	24 597	57%	20%
GDP	2007	6 957	630 945			
GDP share	1995	0.75%	n.a.			
Productivity	1996	12 142	18 837	44 513	64%	27%
	2007	13 500	21 891	54 713	62%	25%
Area (in km^2)		75 416	1 959 244			
Area share of national		3.85%				
Population	2008	1 381 399	106 682 518	3 481 456		
Population share	2008	1.29%	n.a.	n.a.		
Population density	2008	18	54	263		
Elderly dependency ratio	2008	11%	9%	21%		
Youth dependency ratio	2008	50%	46%	28%		
Motorway* density (p)	2007	8.32	3.22	n.a.		
Motorway* density (a)	2007	152.45	175.14	n.a.		
Primary attainment % LF	2005	77.3%	66.9%	27.4%		
Tertiary attainment % LF	2005	12.3%	16.4%	26.0%		
PISA mathematics	2009	424	419	500		
PISA reading	2009	426	425	500		
Unemployment rate	2007	3.1	3.0	6.3	0.09	-3.2
Employment rate	2007	62.0	63.1	66.7	-1.11	-4.7
Patent applications	2000	3.00	6.2	430.0		
Patents per million	2000	2.2	1.6	85.6		
Changes						
GDP pc growth	1995-2007	2.00%	2.08%	2.2%		
GDP growth	1995-2007	2.2%	3.3%	2.8%		
Productivity growth	1996-2007	0.97%	1.38%	1.83%		
Population growth	1995-2008	0.18%	1.17%	0.6%		
WA population growth	1995-2005	1.04%	1.89%	0.8%		
Elderly dependency (pp change)	1995-2008	1.66	0.01	2.50		
Youth dependency (pp change)	1995-2008	-20.76	-0.17	-6.28		
Primary education (pp change)	1995-2005	-3.93	-5.27	-6.09		
Tertiary education (pp change)	1995-2005	1.43	3.59	5.84		
PISA Mathematics (pp change)	2003-2009	42.00	33.52			
PISA Reading (pp change)	2003-2009	36.00	25.19			
Employment rate (pp change)	1996-2007	1.59	1.81	1.87		
Unemployment rate (pp change)	1998-2007	2.19	1.06	-1.82		
Patents per million (pp change)	2000-2000	0.00	0.83	53.29		

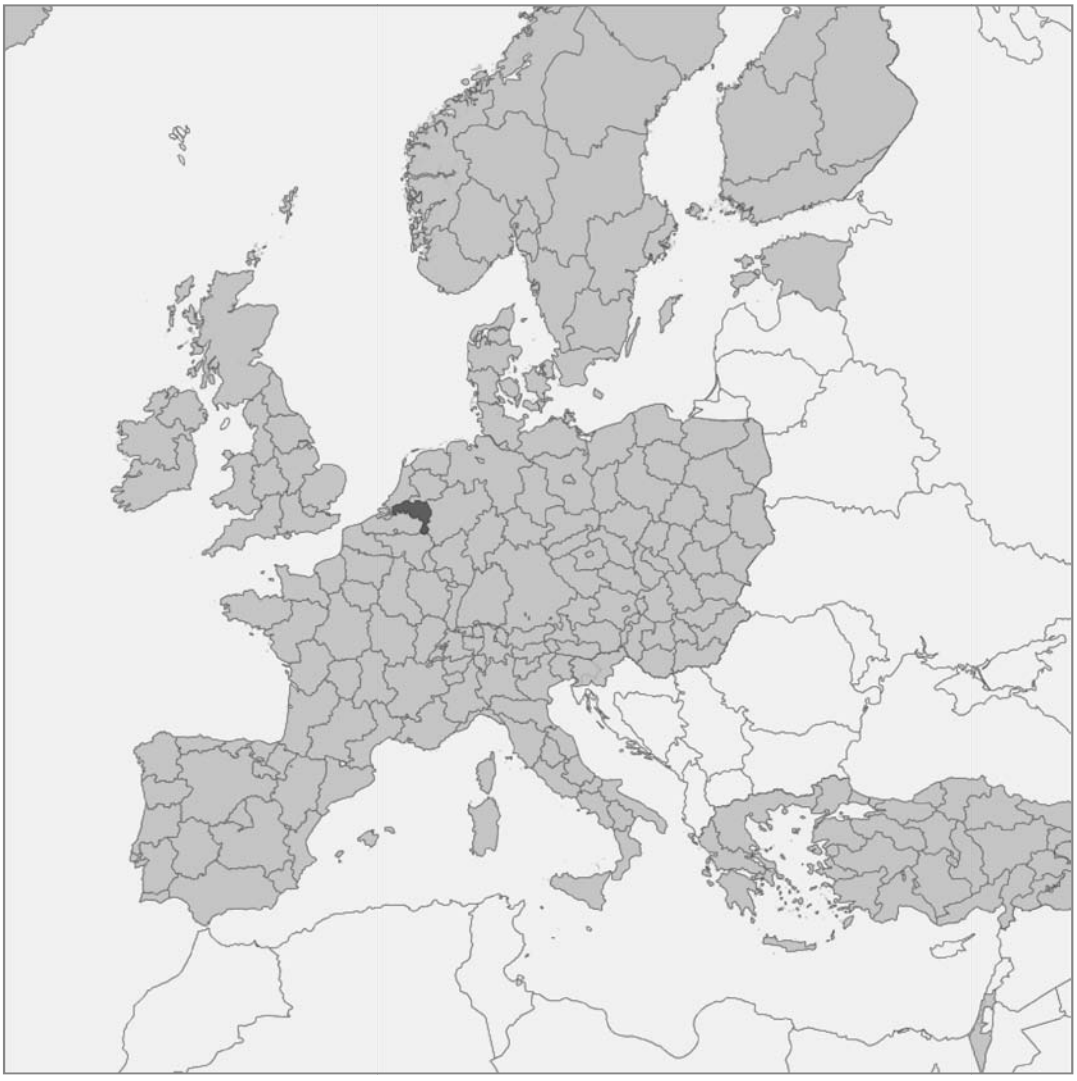
Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area. * Motorway data for Mexico includes motorways and secondary roads.

Source: OECD Regional Database (2011).

Zuid-Nederland, the Netherlands

Figure 3.45. **Zuid-Nederland, the Netherlands**

Regional category: Catching-up potential and growing above the national average



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD Regional Database; map created with OECD Regional eXplorer.

Snapshot

Zuid-Nederland encompasses two smaller administrative TL3 regions, Noord-Brabant and Limburg. Its population was 3.5 million in 2008, or 21.6% of the national population. Its population density, at 468 people per km^2, is quite high, above the national average of 395, and almost double the OECD average of 263.

Located in the southern part of the Netherlands, the region's geographic location is quite central to core European markets, sharing borders with Belgium to its south and southwest and Germany to its east. The neighbouring regions within the Netherlands are West Nederland and Oost-Nederland. North Brabant borders with Zeeland to the west, South Holland to the northwest and Gelderland to the north. Limburg borders Germany and Belgium. The largest cities in the region are Eindhoven, with 213 809 inhabitants, Tilburg (203 492), Breda (173 299), Maastricht (116 200), Hertogenbosch (102 220) and Venlo (100 271). The region has a polycentric settlement pattern fairly evenly spread out across the region. Just 2% of the population live in rural communities, significantly lower the rest of the Netherlands, at 12%, and the OECD average of 45%.

Zuid-Nederland experienced a significant economic shock during the 80s and an important economic event during the 2000, both influencing its productive structure. The first was a jobs crisis and period of restructuring in the 1990s, brought about by problems at Philips, its largest employer. While the Netherlands has traditionally concentrated on trade, banking, transport and distribution, the region has been characterised by a strong presence of the private sector and industry, influenced by the foundation of Philips in 1891 when the Philips brothers started a light bulb factory in Eindhoven. Within 40 years, the company was the most important in the region, employing more than 22 000 workers and becoming involved in many societal initiatives such as housing, education and hospitals. It subsequently became an important multinational firm and the backbone of the region's economy. In the late 1980s, amid a stagnating world economy, Philips faced competition from Japanese and Korean companies, fast-changing demands in the world market and some failing megaprojects. These forced the largest reorganisation in Dutch history. In 1997, Philips decided to relocate its headquarters to the capital. Its workforce in the region reduced by almost half, from 40 000 employees in the 1960s to 25 000 in the early 1990s at a period when other important firms in the region were experiencing financial difficulties and laying off workers. These events triggered a structural change, including changing the overall mindset in the region, new policies and forms of governance and new institutions, all based on the idea of enhancing innovation in order to compete internationally and adopting the concept of open innovation. Philips took the lead, opening the first knowledge campus, and creating many spinoffs to existing business operations. New higher educational institutions were established and the government adopted a "triple-helix"[29] form of governance based on co-operation and enhancing links between the private, public and educational centres. All these initiatives brought a period of success to the region which has now become one of the key knowledge hubs in the EU and in the OECD area. The second, less influential event, was the further expansion of the European market, by the accession of 10 new member countries in 2004 providing new international links and opportunities to firms within the region especially in Eastern Europe.

The Netherlands is a unitary state with two tiers of sub-national government. The first tier consists of 12 provinces (*provincies*) and the second tier 443 municipalities (*gemeenten*). In 2006, 33.5% of total spending was devolved while the regions and below accounted for 11.9% of total revenue. Programmes such as Peaks in the Delta have given a stronger regional focus to economic development policy in the Netherlands. Cross-border co-operation is a key element of regional policy. Rural development initiatives have been introduced the make agricultural activities more productive and build stronger synergies between rural and urban regions.

The provinces perform tasks that are too small for national governments and too large for municipal ones. The provincial government is active on a wide range of activities including spatial planning, infrastructure and transport, economy, environment, recreation, nature, wellbeing, culture, and municipal finances. The chief responsibilities of the municipalities are residential areas and infrastructure. The Netherlands has been undergoing a gradual trend of decentralisation with more responsibilities delegated to the municipalities.

Economic assessment

The taxonomy classifies Zuid-Netherland as a region with catching-up potential and growing above the national average. In 1995 GDP *per capita* was USD 23 833 (adjusted for PPP), around 9% below the national average and 26% above the OECD average. Over the period 1995-2007, its GDP *per capita* grew by 2.5%, outperforming the national growth rate of 1.9% and the OECD growth rate of 2.2%. Consequently the gap in GDP *per capita* closed over this period to just 2% below the national average and further surpassed the OECD average by 30%. The population grew at a rate of 0.30%, lower than the national average of 0.46% and the OECD average of 0.6%. GDP growth overall was 2.4%, the same as the national average and slightly below the OECD growth of 2.8%. In sum the region has been converging nationally in GDP *per capita*, and has further outpaced the OECD average. This is partly explained by the region's lower population growth.

Below we summarise how Zuid-Nederland performs against national and OECD averages for five key indicators. Figure 3.46 summarises this performance against the national average.

- **Productivity in Zuid-Nederland has grown more slowly** than other Dutch regions and the OECD. Productivity – measured by GDP per employee – stood at UDS 57 346 in PPP in 1995, 8% higher than the national figure and 29% higher productivity for the OECD. From 1999 to 2007 productivity grew in the region at a rate of 1.1%, below the national rate of 2.2% and the OECD average rate of 1.83%. Consequently the region's relative productivity has been gradually declining, standing at 1% below the national average and 14% above the average in OECD average by 2007. The ongoing restructuring since the mid 1990s from an industrial to a knowledge economy has influenced productivity growth in a number of ways. Restructuring processes can cause declining productivity as new organisational forms break down old ones. The region's new activities may increase GDP less as many of them are marketed and developed outside of the region. The region also faces shortages in human capital, with insufficient high skilled workers for its needs. Finally, it is competing in a very competitive market undergoing continuous price pressures acting against higher GDP growth.

    - Manufacturing[30] accounts for 28.2% of industrial activity compared to 21.5% for the nation as a whole, while financial intermediation, real estate rental and business activities are lower (21.8% as opposed to 25.5% nationally) as are public sector activities, including health and social work (20.9% as opposed to 22.7% nationally). There are a number of important cluster in the region: the high-tech systems and materials cluster, employing 110 000 workers and the "mother" of other key technology areas in the region; the industrial design cluster, employing 22 000 and responsible for inventing, developing and producing many innovative products; the chemistry and chemical industry

cluster employing 17 000 workers, and a world leader in basic chemistry, food ingredients, coatings and high performance materials; the automotive cluster employing 13 000 workers; and the health cluster employing 13 000 workers.

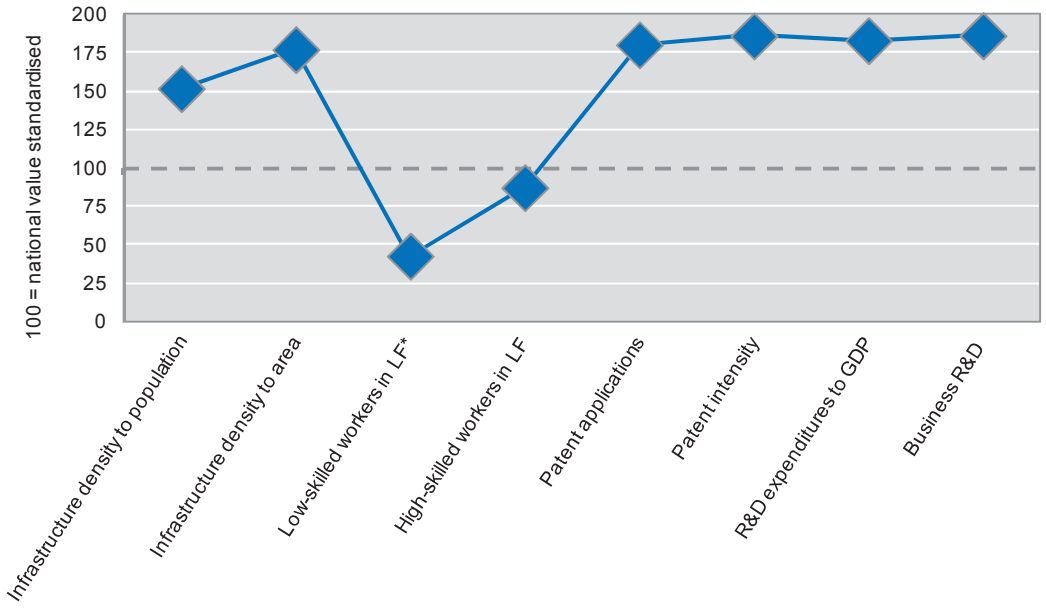
- **Labour market outcomes are adequate**. The labour market has improved significantly over the past decades from close to double digit unemployment during the crisis in the 1990s crisis. The pre-global financial crisis unemployment rate fell to 2.7%, lower than the national rate of 2.9%, with youth unemployment at 5.02% (as opposed to 5.5%); both indicators are significantly lower than the OECD average. Employment rates in the region are 77.5%, close to the national rate of 77.4% and more than 10 percentage points higher than in the OECD. Human capital improvements have been strong and now approach national standards. The region has a slightly higher share of low-skilled workers in its labour force at 23.9% compared to the national average of 22.6% but a lower share than typically in OECD regions. The proportion of highly skilled workers is 33.1%, a bit lower than nationally at 33.8% but well above the OECD average of 26%. The proportion of highly skilled workers has increased in the region by nine percentage points while the proportion of low skilled workers by has fallen by seven percentage points at a time when both remained unchanged nationally. The improvements in human capital can in part be attributed to the presence of an important range of higher educational facilities in the region including three strong universities with different but complementary profiles in Tilburg, Eindhoven and Maastricht; the broad higher educational establishments of Fontys Hogescholen, the world-leading Design Academy in the field of industrial design, Hogeschool Zuyd, Avans Hogeschool, and the renowned Hogeschool HAS Den Bosch in the field of agro-food. At all educational levels (from secondary to university) educational establishments work together with industry.

- **Infrastructure is adequate and above national standards** with good internal and external connections although there is room for improvement. In 2008, motorway density in the region – measured by the ratio of kilometres of motorway to population – was 0.19, higher than the national average of 0.16 and around the OECD average of 0.20. In relation to land area, its motorway density is 92.4, almost double the national value of 62.2 and more than three times the OECD average of 21.9. The region overall has good connections, especially its highway connections running east to west, bringing goods into western ports, mainly Rotterdam. Over 40% of freight is carried on routes between Eindhoven and Venlo, which suffer from heavy truck congestions. An alternative train route has been established between Rotterdam and Dusseldorf to ease freight congestion on the highway and the cities but the train capacity is still low. Bottlenecks exist around the city of Eindhoven, which has only half a ring road circling the north of the city. Road and rail connections between Eindhoven, Rotterdam and Amsterdam are adequate. External connections could be improved, especially rail and highway connections from Eindhoven to Dusseldorf, with the latter having different rail standards. The high speed train from Amsterdam to Belgium is currently not connected to any of the region's main cities. The region has the second largest airport in the country for passenger movements with an important business industrial park around it. Important advancements have been made in applying ICT solutions to freight transport planning, and smart mobility (connecting trucks with ICT). The region has a particularly advanced ICT infrastructure with the most fibre-optic connections in the country and is actively pursuing to connect with next generation technology.

- **Innovation activity is a key asset with strong private sector involvement.** There were 1 930 science and technology patent applications in 2007, more than double the Dutch average and more than five times the OECD average of 430. Patent intensity at 544.2 per million people also surpasses the national average of 208.9 and is more than six times the OECD average of 85.6. The ratio of R&D expenditure to GDP is 2.77%, higher than the national figure of 1.74% and the OECD average of 1.55%. Business R&D expenditure at 2.42% of GDP is more than twice the average private sector share for the Netherlands (1.74%) and the OECD (0.93%). The share is even higher in Eindhoven with private expenditures forming around 8% of GDP. In contrast public sector R&D spending at 0.05% of GDP is significantly lower than national (0.2%) and OECD rates (0.25%).
  - The region's strong innovation performance can in part be attributed to an early adoption of the triple-helix forms of co-operation during the early 90s, giving rise to a large number of research institutions with close links to the region's main clusters.

Ensuring key drivers of growth are integrated and complement each other in positive ways is critical for growth and development and avoids unintended consequences stemming from isolated sectoral interventions (OECD, 2009a). Figure 3.46 presents an integrated picture of several critical growth drivers identified in this section. This shows that the region has adequate levels of infrastructure and innovation intensity. Its key challenges are in improving human capital, both in reducing the share of low-skilled workers and improving the share of highly skilled workers.[31]

Figure 3.46. **How drivers of growth compare to the national average, Zuid-Nederland, 2008**



Note: *Higher value means the region has fewer low-skilled workers in its labour force (LF); all values are standardised.

Source: OECD Regional Database (2011).

Key elements of growth and development

A number of distinct factors have influenced the performance of the region.

- **A successful turnaround** driven by mobilising key actors and stakeholders in the region**.** The crisis in the early 1990s, with the relocation of Philip's headquarters to Amsterdam, induced a sense of common urgency among the different stakeholders in the region, mobilising them in a spirit of strong co-operation. Three leaders in the region, the major of Eindhoven (Rein Welschen), the president of the technical university of Eindhoven (Henk de Wild) and the president of the chamber of commerce (Theoi Hurks) came together to combine the efforts of the private, public and educational sector. The crisis forced these parties to intensify contact with each other and start co-operating. Their strong personalities meant the interests of all three communities were represented equally without any one dominating, thus mobilising a large number of other stakeholders from the three communities. The first, fruitful, co-operation initiatives soon expanded to take in more stakeholders. By the end of 2005, these initial moves were formally institutionalised into the Brainport Programme which since 2010 has been executed by Brainport Development. The composition of its board is based on the regional triple-helix model, with four mayors (of Eindhoven, Veldhoven, Helmond and Waalre), the presidents of the four knowledge institutions (TU/e, FONTYS, University of Tilburgand and ROC Eindhoven), and four business representatives (from Philips, VDL, BZW, and the regional Chamber of Commerce). The Brainport programme has been very influential in the region's overall development and still maintains a strong spirit of co-operation among the three communities resulting in a wide range of programmes and initiative. Many provinces from the Netherlands and elsewhere regard the regional triple-helix institutional arrangement as best practice.

- **Continuity in policy programmes and goals**. After the crisis, representatives from the three communities (private, public and academia) established a plan over 1993-95 formalised into a regional development plan in 1996. This plan was quite defensive, with the aim of getting through the crisis, and was heavily driven by external resources. The programme, also known as the “stimulus”, combined resources from the EU (both from the European Social Fund and from the Structural Funds), the national government, the provinces and the 21 municipalities amounting to significant sources. Funds were allocated to enhance the triple-helix structure supporting high-tech business development with close links to higher education. At the outset the focus has been on bringing low-skilled unemployed workers back into the workforce. The external sources were gradually phased out over time especially with the Horizon programme established in 2000 which strengthened the links further between the sectors and was more proactive and market-driven, but provided continuity with the previously established goals. The Brainport Navigator 2013 programme, established in 2005, was also a joint initiative from the triple-helix partners defining projects in four domains: technology (more public and private R&D, better linkages), business (start-ups, attracting FDI, new business on the axes of

societal challenges and technological excellence), people (more students, life-long learning, attracting knowledge workers) and basics (living climate, cultural facilities, accessibility). Finally, the Brainport 2020 strategy and action programme, ordered by the national government, was established by the regional triple helix in 2011. This programme focuses on the same domains as the Brainport Navigator, but involves more parties, both from the regional and national level. All the different programmes are thus all based on strengthening links and aligning goals among the private, public and educational communities in the region.

- **A common voice and a strong position** is an asset for communicating with the central government. Through the close links between the private, public and education sectors, the region's common voice, common agenda and common goal in the different policy areas has made it quite effective in its bargaining position with respect to other regions and the central government. The same message is given whether by the chairman of Philips Nederland or by the mayor of Eindhoven allowing the region to be consistent and successful in bargaining and negotiations.

- **Strong open innovation value chains with a strong involvement of the private sector** have been a critical driver for the region's successful performance in recent years. Innovation was previously based on closed organisational forms and mainly driven by Philips. The company's loss of international competitiveness drove it to adopt the concept of open innovation, establishing the first knowledge campus, and creating many spinoffs to existing business operations (ASML, NXP, FEI, Atos Origin, Liquavista, Panalytical, VDL ETG, Assembleon, Atos Origin, Keytec, M&T and many others). This change of approach has helped make the region one of the main knowledge hubs in the OECD area. This has been recognised by the international community, who declared Brainport Eindhoven the Intelligent Community of the Year 2011 out of more than 400 participants.

Main bottlenecks for growth and development

The analysis below is based on information obtained during the OECD mission, responses to a questionnaire and the results of our own analysis (summarised in Table 3.24).

- **Lack of public funding for knowledge infrastructure**. The public knowledge base is too narrow and lags behind that of other regions in the Netherlands and Europe. Moreover, the contrast with business spending on R&D is large. The ratio of public to private R&D stands at 1 to 10. This makes the ecosystem vulnerable. The challenge for the region is to strengthen its public knowledge infrastructure in such a way that it can contribute to the further development of the region.

- **A shortage of talent.** Zuid-Netherland has too few technically educated people in its workforce. Shortages are to be expected in both the short and long term. The labour force is projected to shrink and the number of jobs in technical disciplines is expected to rise. Currently, the outflow of technical employees from the labour force is greater than the inflow. If no action is taken, the region is expected to experience a significant shortage estimated at 3 000 unfilled vacancies a year. Low numbers of young people are choosing a technical education in the region. The highly cyclical nature of the high-tech sector requires periods of intense hiring but also intense layoffs. National regulations make it hard to retain knowledge workers as under current regulation foreign workers without jobs are required to leave the country after three months. The regional authorities are putting in place interesting initiatives aimed at measuring skills and competences of workers within firms (e-portfolio initiative) in order to offer a more diversified portfolio of job opportunities to knowledge workers allowing them have a better career development but also more job opportunities in cyclical periods.

- **Lack of international appeal**. The region lacks the cosmopolitan character that is often found in international cities, as well as a strong international community. Without an international appeal and high-quality metropolitan cultural services, the region struggles to attract companies and knowledge workers from elsewhere. In addition, the region does not have the most attractive climate characterised by cold weather and rainy days. One factor that will help in this respect is the above-mentioned improvements in the train connections with Germany and the German and Dutch high-speed network.

- **Failure to further unleash the innovation potential in the region.** As previously highlighted, the region's productivity growth is slowing and falling below the national rate over the past decade. In order to reverse this trend the region will need to commercialise its existing inventions better. This will require educational institutions to concentrate more on entrepreneurship. Unleashing the innovation potential further in this region will require more venture capital and further attraction of high-tech workers to this region.

- **Barriers to cross-border co-operation**. The region currently enjoys current good cross-border co-operation between the Eindhoven-Leuven-Aachen triangle (ELAT), also known as the golden triangle. A treaty of co-operation was signed in 2004 by the mayors of Eindhoven, Aachen and Leuven in presence with CEOs of industry and knowledge centres resulting in a very successful joint program. Nevertheless, barriers to deeper co-operation between the three countries remain. There are differences in fiscal rules, tax regimes and social security rules which make it difficult to mobilise resources, labour and knowledge across the three locations, and in particular the movement of foreign workers is currently highly inflexible and subject to different national regulations. There are also opportunities in Europe that could be seized better in Zuid-Nederland. The region currently has only half the amount of European innovation subsidies that would be expected based on the share that the region has of European R&D.

Table 3.24. **Statistical summary, Zuid-Nederland**

	Period	Zuid-Nederland	Netherlands	OECD	National gap	OECD gap
Levels						
GDP pc	1995	23 833	26 082	18 926	91%	126%
	2007	32 065	32 697	24 597	98%	130%
GDP	2007	113 758	403 195			
GDP share	1995	21.24%	n.a.			
Productivity	1999	57 346	53 019	44 513	108%	129%
	2007	62 639	63 286	54 713	99%	114%
Area (in km^2)		7 291	41 528			
Area share of national		17.56%				
Population	2008	3 548 532	16 405 399	3 481 456		
Population share	2008	21.63%	n.a.	n.a.		
Population density	2008	468	395	263		
Elderly dependency ratio	2008	23%	22%	21%		
Youth dependency ratio	2008	25%	27%	28%		
Motorway density (p)	2008	0.19	0.16	0.20		
Motorway density (a)	2008	92.44	62.20	21.91		
Primary attainment % LF	2008	23.9%	22.6%	27.4%		
Tertiary attainment % LF	2008	33.1%	33.8%	26.0%		
Unemployment rate	2008	2.7	2.9	6.3	-0.20	-3.6
Employment rate	2008	77.5	77.4	66.7	0.09	10.8
Long-term unemployment	2008	1.01	1.0	2.4	0.01	-1.4
Youth unemployment	2008	5.02	5.5	15.3	-0.47	-10.3
Patent applications	2007	1 930.53	860.9	430.0		
Patents per million	2007	544.2	208.9	85.6		
R&D to GDP	2005	2.77%	1.74%	1.55%		
BERD to GDP	2005	2.42%	1.07%	0.93%		
GERD to GDP	2005	0.05%	0.20%	0.25%		
Changes						
GDP pc growth	1995-2007	2.50%	1.90%	2.2%		
GDP growth	1995-2007	2.41%	2.40%	2.8%		
Productivity growth	1999-2007	1.11%	2.24%	1.83%		
Population growth	1995-2008	0.30%	0.46%	0.6%		
WA population growth	1995-2008	0.05%	0.36%	0.8%		
Elderly dependency (pp change)	1995-2008	5.59	0.03	2.50		
Youth dependency (pp change)	1995-2008	-0.66	0.00	-6.28		
Primary education (pp change)	1999-2008	-6.96	-6.41	-6.09		
Tertiary education (pp change)	1999-2008	8.91	8.61	5.84		
Employment rate (pp change)	1999-2008	6.42	7.01	1.87		
Unemployment rate (pp change)	1999-2008	-0.27	-1.13	-1.82		
Patents per million (pp change)	1995-2007	373.13	131.78	53.29		
R&D to GDP (pp change)	1997-2005	0.32	-0.15	0.13		

Notes: The national average in GDP *per capita* and productivity are weighted; all other national average values are unweighted, meaning each regional value is treated as one observation. BERD = business R&D expenditure; GERD = government R&D expenditure; LF = labour force; pc = *per capita*; pp = percentage point; R&D = research and development; WA = working age; p = population; a = area.

Source: Calculations based on *OECD Regional Database* (2011).

Synthesis of case study findings

In this section we pull together the main findings from the 23 case studies. Table 3.25 summarises the main factors for growth in the dynamic regions (those that have caught up) while Table 3.26 summarises those and in the less dynamic regions that have not yet caught up to national averages. Tables 3.27 and 3.28 then summarise the bottlenecks hindering growth among both the catching-up group of regions and the non-catching up group.

Table 3.25. **Main factors for growth in the dynamic regions**

Region	Main growth factors
Aquitaine	• Tourism development • Regeneration of the centre of Bordeaux through urban and spatial planning • Strong research capacity, mainly centred on Gironde
Principado de Asturias	• Infrastructure improvements connecting a relatively closed region to external markets • Improvements in human capital • Mobilising key actors by reaching agreements in a region with a strong legacy of conflict • Transition from reliance on external subsidies towards own growth potential
Brandenburg	• Adequate infrastructure investments • Human capital development • Mentality and policy shift from a focus on subsidies towards growth potential
Central Transdanubia (Közép-Dunántúl)	• Strong influx of FDI to the region and strong presence of foreign investors • Strong involvement of the business sector combined with a work ethic culture • Favourable geographic position • Fairly advanced infrastructure network
Durango	• Presence of natural resources and improvements in infrastructure connections and close links with northern markets • Establishment of the nation's largest dairy clusters in the north of Mexico • Cross-regional linkages with neighbouring region of Coahuila • Human capital capacity building and in vocational training • Presence of road and rail infrastructure and adequate geographic location
Jalisco	• Adequate transport infrastructure capitalising on the region's privileged geographic position • Enhanced dialogue and interactions among key stakeholders promoting endogenous growth • Urban development in the metropolitan area of Guadalajara • Ability to transform economy to higher value-added goods through human capital gains • Adequate brand name of Guadalajara
Marche	• Entrepreneurial tradition • Strong involvement of the private sector in manufacturing tradition • Ability to turn around traditional sectors through innovation-intensive initiatives • Active role by key local public and private actors focusing on innovation and workforce development/retention
Midi-Pyrénées	• Innovation intensity driven by steady growth of the aerospace cluster and active innovation-driven policy • The tertiary education brings a very high research potential to the region • High international exposition
Sachsen-Anhalt	• Strong presence of industry and industrial related activities • Favourable geographic location and proximity to core European markets • FDI investments • Important improvements in infrastructure • Gradual change of mentality is making the region less dependent on external interventions and more on internal ones
San Luis Potosi	• Making the most of a good geographical location • Abundant labour force with technical skills in the surging sectors • Favourable regulatory environment and policies supporting private sector activities • Adequate infrastructure has helped consolidate an important logistics hub around the metropolitan zone • Improved linkages between firms and universities

Table 3.25. **Main factors for growth in the dynamic regions** (*cont.*)

Region	Main growth factors
Wielkopolskie	• Favourable geographic location • Differentiated base for economic development • Attractive business environment • Favourable social determinants for economic development • Internationalisation of regional economy • Adequate infrastructure facilities providing good external connection • Institutional arrangements supporting economic development
Zuid-Nederland	• A successful turnaround driven by mobilising key regional actors and stakeholders • Continuity in policy programmes and goals over several cycles resulting in a shift from exogenous-based programmes to internal ones • A common voice and strong position • Strong open innovation value chains with a strong involvement of the private sector

Table 3.26. **Main factors for growth in the less dynamic regions**

Region	Growth factors
Chiapas	• The region's brand name has brought positive gains • The application of technologies to the region's natural amenities has brought important gains • Nature tourism has been an important driver of the region's value-added • Infrastructure gains have benefited the region over the past decades
Estado de México	• The region's attractiveness has been an important driver of population and FDI investment • FDI investment in the region has been quite significant • Proximity to the main production consumer hub in Mexico • The presence of a significant number of larger firms has been an import driver for the region's manufacturing cluster
Lubelskie	• Internal demand for goods and services • Proximity to the eastern border • Adequate levels of human capital in higher education
Nord-Pas de Calais	• Important concentration of clusters and poles of competitiveness • Attractive higher education institutions (HEIs) • Urban dynamism, mainly in the capital city of Lille • Growth of the service sector during an ongoing period of restructuring
North East (Tyne and Wear)	• The regeneration in the City Region has brought important economic benefits to the TWCR • Diversification of traditional sectors • Strong higher educational programmes and institutions
North West (Manchester)	• Coherence and continuity in governance • Capital deepening • Good supply of highly skilled workers
Podlaskie	• Adjusting of economic activities to the region's assets and its environmental constraints • Institutional arrangements supporting economic development emphasising the mobilisation of endogenous resources • Mobilising the region's natural environment and resources has gradually changed its image from rural to relatively attractive • Enhancing links and contacts with Belarus and Lithuania has taken advantage of the region's proximity to eastern borders • Adequate higher educational facilities have brought important human capital potential to the region
Sicilia	• Important improvements in the transport infrastructure networks • Improvements of the Sicilia brand • Small-scale examples of innovative policy
Východné Slovensko	• Low wage costs • Good border co-operation • Tourism development
Yorkshire and Humberside (Leeds)	• The strong presence of the private sector has been an important factor in the diversification of the economy • A relative diversified economic structure • Critical mass in human capital due to a notable concentration of higher education institutions • Central geographic location with good access to ports and rails • Leeds is the largest city region outside London
Zacatecas	• Agriculture activity remains an important economic activity • The flows of remittances from migrants living outside of the region • The presence of minerals and mineral activities • The presence of an international airport

Table 3.27. **Main bottlenecks in the dynamic regions**

Region	Bottlenecks
Aquitaine	• Insufficient size and closures of industrial enterprises • Insufficient integration of the region's regional innovation system • Low entrepreneurial culture along with anti-manufacturing sentiment • A surge of activities in the residential economy
Principado de Asturias	• Demographic effects; in particular high elderly dependency ratios • Insufficient involvement of the private sector in R&D • A low entrepreneurial spirit
Brandenburg	• Population decline has been a long-term reality in Brandenburg • Low business R&D investment • Small proportion of major companies in the region
Central Transdanubia (Közép-Dunántúl)	• Innovation intensity in the region is relatively low • Human capital gaps with a high proportion of low-skilled workers • Red tape and regulatory burdens
Durango	• Low diversification of its economy and reliance on agricultural activities and natural resources make the region vulnerable to external fluctuations • Enhanced competition by Asian importers in wood and wood-related activities in internal markets • Demographic trends bring challenges to public investments and represent a loss of human capital potential • Insufficient integration of the value chains in mining and wood-related sectors represent important bottlenecks for producing higher value added goods • Inadequate logistics infrastructure could give greater impetus to the region
Jalisco	• A lack of regional entrepreneurial culture • Increased commuting and congestion costs represent important bottlenecks to the Guadalajara metropolitan area • Bridging gaps between human capital supply, and the needs of the region • Lack of effective territorial co-ordination in the region driven by highly sectoral national policies and lack of leadership
Marche	• Vulnerability to global competition especially in traditional sectors with low levels of innovation • Gaps in accessibility and ICT infrastructure • Weak access to credit and venture financing • Ageing population brings important challenges to the region • Inability to define and apply performance-based indicators
Midi-Pyrénées	• Decline of low-tech activities (textiles, leather, wood processing) in a number of rural areas • Fragmented labour markets reduces the growth potential of the region and brings important challenges to governance • Spatial planning and in particular urban planning remains underdeveloped • Infrastructure gains could improve internal and external accessibility
Sachsen-Anhalt	• Population declines in the region bring important challenges • Brain drain of highly skilled workers represents a loss of human capital potential • Low innovation capacity due to lack of company headquarters and obstacles to enhanced links between university and business
San Luis Potosi	• Limited local business capacity • A culture of low levels of co-operation among businesses in productive sectors • Problem of urban development • Connectivity between the metropolitan area of San Luis Potosi and the ports of Tampico-Altamira
Wielkopolskie	• Uneven development of transportation infrastructure • Limited investment resources available to enterprises • Low application of its research and scientific potential, and relatively low funding of R&D and innovations, especially in enterprises • Low flexibility of the education system which is not adjusted to real needs • Slow pace of further modernisation of regional economy • Inefficiency of selected policies supporting development undertakings
Zuid-Nederland	• The lack of public funding is a challenge for the region to strengthen the knowledge infrastructure • The growing demands of the region are outpacing the availability of talent • Lack of international appeal and brand name of the region • Bottlenecks in further unleashing the innovation potential in the region and creating more economic value of existing innovations • Need to further enhance cross-border co-operation with regions in Germany and Belgium

Table 3.28. **Main bottlenecks in the less dynamic regions**

Region	Bottlenecks
Chiapas	• Highly fragmented economic activities with few links, impeding spillover and scale-effects • The need to balance traditional culture and social policies with development efforts • There is an important lack of human capital and loss of human capital potential • The region's geographic terrain hampers development efforts • Inadequate infrastructure still represents an important bottleneck for development
Estado de México	• Demographics effects − high population growth in the region • Slow reaction by the region to external shocks and slow implementation of much needed structural transformation of the region's productive structure • Lack of highly skilled labour measured by the proportion of the labour force with tertiary educational attainments
Lubelskie	• Inadequate integration of the region into spatial and functional structures at the supra-regional and national level • Inadequate infrastructure in the region, especially in transportation • The region's unfavourable geographic location on the largely impermeable EU external border is an important bottleneck • Inability to restructure an existing low productive agriculture sector
Nord-Pas de Calais	• Persistent weakness of R&D investments and low private sector involvement in R&D • Limited entrepreneurial culture and low levels of private initiative • Loss of human capital potential for future generations • Gains in accessibility and the region's privileged geographic location have still not fully translated into economic gains
North East (Tyne and Wear)	• Low private sector involvement leads to excessive reliance on public sector activities • The region currently faces insufficient critical mass to generate agglomeration and spillover effects due to fragmented internal markets and insufficient strong internal connections • Inability to fully mobilise key actors in the region and accelerate a shift towards growth • Lack of continuity in governance and in policy design brought by institutional stability
North West (Manchester)	• Mismatch in skills between demand and supply • A fragmented labour market area due to poor connectivity within the functional city region • An excess of programmes too thinly spread
Podlaskie	• Inadequate integration of the region into spatial and functional structures at supra-regional and national level • Inadequate infrastructure in the region, especially transportation • The region's unfavourable geographic location is an important bottleneck • Lack of internal cohesion due to strong internal fragmentation • Exclusion of large parts of the region from economic activities (environmental constraints) • Insufficient links between educational institutions and local and regional business activities representing a loss of human capital potential • Inefficiency of selected policies supporting development undertakings • Important gaps in of multi-level governance
Sicilia	• Difficulty in creating a paradigm shift toward growth potential • Lack of political vision to change traditional, entrenched interests vested in the status quo in the region • Low competitiveness in the private sector and lack of dynamism inducing a significant brain drain of young, productive talent • Institutional capacity building should be improved both in terms of organisational efficiency and in term of use of human capital
Východné Slovensko	• Unfavourable geographic location • Inadequate infrastructure with low motorway density • Brain drain due to insufficient industrial production • Unfavourable policy environment
Yorkshire and Humberside (Leeds)	• Room remains for improving internal connectivity • Lack of effective mobilisation of all key stakeholders in the region • Lack of labour market capacity and skills • Although its economy has size and scale, the Leeds city region lacks market awareness
Zacatecas	• High levels of outmigration from the region affecting the demographics • Low levels of industrial activity focusing mainly on low value-added activities • The modernisation of agriculture has been moderate • Inadequacy of educational level and low availability of jobs-skill in the region • Low participation of women in the workforce

We next synthesise and codify the combined 185 growth factors and bottlenecks listed in the previous tables into 18 broader thematic areas (see Annex 3.A1). We use these broader thematic categories as a tool for analysis, permitting us to detect the most frequent growth factors and bottlenecks in the sample of case studies, and in particular in those regions that have caught up and those that have not. We also examine for areas of complementarities in our dynamic regions and for common bottlenecks. Table 3.29 ranks them from high to low according to how many regions experienced them.

Table 3.29. **Growth factors and bottlenecks ranked by occurrence in the case studies**

	Thematic areas	Growth factors ranked	Bottlenecks ranked	Sum
1	Policies	13	13	26
2	Human capital	12	11	23
3	Innovation	7	13	20
4	Infrastructure connectivity	11	8	19
5	Institutions	8	9	17
6	Business	8	7	15
7	Geography	7	5	12
8	Internationalisation	8	3	11
9	Diversified economy	5	4	9
10	Density and cohesion	0	8	8
11	Demographic factors	0	7	7
12	Natural assets and amenities	4	0	4
13	FDI	3	0	3
14	Financing	0	3	3
15	Agriculture	1	2	3
16	Tourism	2	0	2
17	Environmental constraints	0	1	1
18	Other	2	1	3
	Total	90	95	**185**

Note: For more details about the indicators included in these 18 summary themes, please see Annex 3.A1 at the end of this chapter.

This ranking shows that, of the growth factors, regional policies and human capital are the thematic areas most strongly represented, followed by infrastructure and institutions. Amongst the bottlenecks, policies and innovation are the most strongly represented, followed by human capital and institutions. Whilst it is important to bear in mind that the growth factors and bottlenecks are neither exclusive nor exhaustive, the research design applied in the case studies permits us to identify the critical and distinctive factors influencing the performance of the regions between 1995 and 2007.

The next section outlines some of the broad-brush lessons emerging from the 23 case studies.

Growth factors in dynamic regions

Table 3.30 lists which of the 18 themes presented the previous section were important for growth in the dynamic case study regions, i.e. those regions that have grown faster than the national average over the 1995-2007 period. It is interesting to observe the

important role policies and institutions appear to play in these dynamic regions. The most common thematic area among the growth factors in these types of regions appear to be infrastructure and policies (with equal frequency), followed by institutions, human capital, innovation and the business environment. It is also interesting to observe the distribution of all five growth factors: no one factor is particularly salient, suggesting successful performance is likely driven by a combination of these growth factors.

Table 3.30. **Most common growth factors in the dynamic regions**

Factors for growth in regions growing above average	Frequency	Percentage
Policies (shift in mentality, silos, fragmentation, adjusting policies to assets, linkages, cross border, urban spatial)	8	15
Infrastructure connectivity	8	15
Institutions (governance, leadership capacity, continuity, mobilisation)	6	12
Human capital	6	12
Innovation, including entrepreneurial innovation	5	10
Business environment, public sector activity and industry	5	10
Geography	4	8
Internationalisation: international competition and brand name attractiveness	3	6
Presence of natural assets and amenities	2	4
FDI	2	4
Economy (diversified, differentiated and market aware)	1	2
Other	1	2
Tourism	1	2
Density (cohesion, internal fragmentation, labour market mismatch)	0	0
Demographic factors	0	0
Agriculture	0	0
Environmental constraints	0	0
Availability of financing	0	0
Total	**52**	**100**

Infrastructure and connectivity appear to be critical factors for growth in these dynamic regions. These include infrastructure investments which improve internal transport infrastructure, which connect relatively closed and isolated regions to external markets, and which ensure that transport infrastructure capitalises on privileged geographic positions. For example:

- Modernising transportation networks in Brandenburg, Sachsen-Anhalt and Central Transdanubia has improved internal transport and external connectivity.
- Infrastructure improvements have connected relatively remote regions to external markets in Asturias and to EU markets in Wielkopolskie.
- Investments in infrastructure helped consolidate an important logistics hub in San Luis Potosi.
- Transport infrastructure has capitalised on the privileged geographic positions of Jalisco and Durango.

Policy is an equally important factor for growth in these regions. Important policy objectives and policies include adopting the new regional paradigm which shifts from a focus on subsidies towards building endogenous growth potential (OECD, 2009a),

polices that improve linkages (among firms and universities, and cross-border), and policies targeting urban regeneration. For example:

- Several previously underdeveloped regions – Asturias, Brandenburg, Sachsen-Anhalt and Zuid-Nederland – have now benefitted from a shift in mentality and policies away from reliance on subsidies and towards growth based on nurturing their existing potential.
- Linkages between firms and universities have been improved in recent years in San Luis Potosi and cross-regional linkages improved between Durango with neighbouring Coahuila, one of the most dynamic regions in the entire country, bringing significant growth to Durango's core sectors.
- Urban development/regeneration and spatial planning have been important drivers in Aquitaine and Jalisco).

Institutions (such as governance, leadership, capacity, continuity and mobilisation, see Annex 3.A1) were also important. Factors encompass using negotiation and dialogue as important tools for mobilising key actors, institutional arrangements that support economic development, giving regional actors a common voice and strong position, and an active role for key local public and private actors focusing on innovation and workforce development/retention. For example:

- Negotiation and dialogue were important for mobilising key actors in several regions (Asturias and Jalisco and Zuid-Nederland).
- Institutional arrangements supporting economic development, such as building local institutional capacity and guiding the regional development processes have been important elements in Wielkopolskie.
- A common voice and strong position is an asset for communicating with the central government and can be created by close links between the private, public and education sectors (e.g. Zuid-Nederland).
- Active role by key local public and private actors focusing on innovation and workforce development/retention (Marche).

Human capital development − including strengthening tertiary education and technical skills, matching human capital to market needs and offering vocational training – is also effective (see Annex 3.A1 for more detail). For example:

- An adequate and continued supply of skilled workers was a critical element for development in Brandenburg; in Asturias a key for success has been reducing the share of low-skilled workers by training programmes targeting young children in schools and ensuring they continue with education, technical students and vocational training programmes as well as improving communication between the private sector and education centres allowing human capital to gradually become more aligned to the demands of the market.
- The San Luis Potosi region enjoys an abundant labour force with sufficient technical skills in the surging sectors.
- Tertiary education improvements brought a very high research potential to the Midi-Pyrénées region.

- Establishing a number of higher education and research institutions with close links to the main clusters in the region allowed Jalisco to transform its economy to one based on higher value-added goods.
- Durango benefited from building its capacity of human capital and vocational training.

Innovation can be successfully promoted through strong, open innovation supply chains, encouraging entrepreneurial activities and innovation clusters. For example:

- Zuid-Nederland benefitted from strong open innovation value chains and a strong involvement of the private sector.
- Marche's entrepreneurial tradition was a growth factor, combined with its ability to turn around traditional sectors through innovation-intensive initiatives.
- Aquitaine has benefitted from the strong research capacity of its great diversity of labs involved in advanced and leading edge technologies, as well as the presence of higher educational institutions.
- Innovation intensity driven by steady growth of the aerospace cluster and active innovation policy has helped to stimulate growth in the Midi-Pyrénées.

Finally, **business and industry** are also of key importance, especially the presence of a business-friendly environment, and the involvement of the business sector in the development strategy of the region and a good work ethic. For example:

- A strong presence by industry and related activities was a factor in Sachsen-Anhalt.
- A favourable regulatory environment and policies supporting private sector activities were beneficial in San Luis Potosi and Wielkopolskie.
- Strong involvement of the private sector in manufacturing helped Marche grow.
- Strong involvement by the business sector, combined with a strong work ethic, have been important in Central Transdanubia.

Bottlenecks in regions growing below the national average

What are the bottlenecks to growth in those regions that are growing too slowly? Table 3.31 lists the main categories, and shows institutional bottlenecks have a particularly strong influence, followed by policies, density, human capital and geographical factors. It is interesting to note that institutions and policies are also important bottlenecks for development as well as important factors for growth. Other bottlenecks include density and cohesion, internal fragmentation and labour market mismatch. "Density and cohesion" refers to the cohesiveness of the regional structure in terms of local labour markets, and the administrative structure. For example, Podlaskie has a fragmented administrative structure largely because three regions were merged to form a single region and two capital cities lost their administrative role. This makes defining and implementing policy a challenge horizontally and vertically. In terms of local labour markets, Midi-Pyrénées features an interesting contrast, containing the growing metropolis of Toulouse on the one hand, and peripheral mid-range cities in the process of restructuring their economic base on the other. There are also continuing efforts to strengthen the integration between the relatively closed economies of Leeds, Manchester and Sheffield.

Table 3.31. **Most common bottlenecks in regions growing below the average**

Bottlenecks in regions growing below average	Frequency	Percentage
Institutions (governance, leadership, capacity, continuity, mobilisation)	8	15
Policies (shift in mentality, silos, fragmentation, adjusting policies to assets, linkages, cross border, urban spatial)	7	13
Density and cohesion (internal fragmentation, labour market mismatch)	7	13
Human capital	6	12
Geography	5	10
Infrastructure connectivity	4	8
Business environment (public sector activity and industry)	3	6
Demographic factors	3	6
Innovation including entrepreneurial innovation	2	4
Agriculture	2	4
Diversified and differentiated economy with market awareness	1	2
Other	1	2
Environmental constraints	1	2
Internationalisation (international competition, brand name attractiveness)	0	0
Presence of natural assets and amenities	0	0
FDI	0	0
Tourism	0	0
Availability of financing	0	0
Total	**50**	**100**

The most common **institutional** bottlenecks include poor mobilisation of stakeholders, lack of continuity and coherence in policy implementation by institution, institutional instability, lack of a common and strategic vision, low capacity and gaps in multi-level governance (MLG). For example:

- Sicilia suffers from a lack of political vision to change traditional, entrenched interests vested in the *status quo*, weak institutional capacity (both organisational efficiency and use of human capital) and an inability to define and apply performance-based indicators.
- Podlaskie suffers from gaps in multi-level governance with no good examples of good practice and a lack of internal cohesion.
- The North West (Manchester) suffers from too many programmes that are too thinly spread.
- Key stakeholders in both Yorkshire and Humberside (Leeds) and the North East (Tyne and Wear) are poorly mobilised in support of pro-growth policies.
- The North East (Tyne and Wear) have also been affected by poor continuity in governance and policy design, caused by institutional instability.

The policy paradigm appears to be a frequent bottleneck in our case studies, especially the inability to shift policies away from a relying on subsidies towards policies that mobilise a region's own resources and assets; inefficiencies in selected policies; insufficient links between different institutions; and slow reactions to external shocks. For example:

- Sicilia is being held back by the difficulty of creating a policy paradigm shift on the part of both regional and national government towards realising its growth potential.
- Podlaskie suffers from inefficient policies supporting development, and insufficient links between educational institutions and local and regional business activities, representing a loss of human capital potential.
- Východné Slovensko's issues are the lack of constructive dialogue between the national and the regional level, inadequate mechanisms to ensure a bottom-up approach, a lack of capacity for analysis and objectivity for strategic planning and identifying priorities, a lack of evaluation methods and the need for a more transparent and objective policy process.
- Both Podlaskie and Lubelskie are affected by their inadequate integration into the supra-regional and national level. This was caused by their limited development potential and inability to attract sufficient investment and business activities.
- Growth in Estado de México was hindered by the region's slow reaction by the region to external shocks and slow implementation of much needed structural transformation in the region's productive structure.

A significant bottleneck in non-catching up regions is **internal fragmentation and labour market mismatch,** including low participation of women in the workforce, mismatch of skills between demand and supply, a fragmented labour market due to poor connectivity, insufficient critical mass to generate agglomeration and spillover effects due to fragmented internal markets, fragmented economic activities and insufficient strong internal connections. For example:

- There is low participation of women in the workforce in Zacatecas.
- North West (Manchester) has a mismatch between demand and supply of skills.
- A stumbling block for North West (Manchester) and Yorkshire and Humberside (Leeds) is their fragmented labour market due to poor connectivity within the functional city region.
- North East (Tyne and Wear), Chiapas and Podlaskie don't have sufficient critical mass to generate agglomeration and spillover effects due to fragmented internal markets, fragmented economic activities and insufficiently strong internal connections.

In terms of **human capital,** the most important bottlenecks are an insufficient stock of human capital, lack of skills and brain drain:

- Nord-Pas de Calais and Východné Slovensko have experienced brain drain due to insufficient industrial production; this is leading to the loss of human capital potential for future generations.
- Low labour market capacity (low labour market participation and skills) are bottlenecks in Yorkshire and Humberside, Chiapas and the Estado de México.
- Low educational levels and poor jobs skills are issues for Zacatecas.

Geographical bottlenecks include an unfavourable geographic location, terrain that is not suited to productivity gains, and unfavourable external borders. For example:

- Podlaskie and Východné Slovensko both suffer from an unfavourable geographic location.
- Chiapas struggles with terrain that is not suited to productivity gains.
- An impermeable EU external border is undermining growth in Lubelskie.

Infrastructure and connectivity bottlenecks include transportation, low motorway density, and a failure to capitalise on improved accessibility and the region's privileged geographic location. For example:

- Chiapas, Podlaskie and Lubelskie all have inadequate infrastructure, especially transportation.
- Low motorway density is a problem in Východné Slovensko.
- Nord-Pas de Calais has been unable to capitalise on improved accessibility and the region's privileged geographic location.

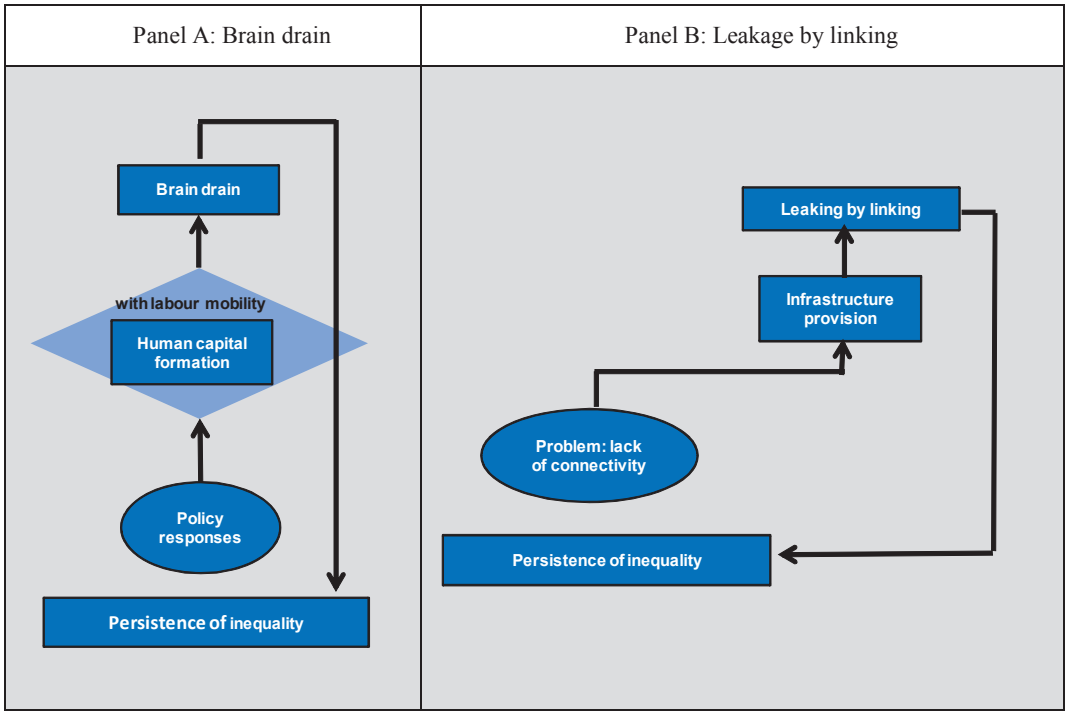
Synergies in growth factors and bottlenecks

Previous studies (OECD, 2009a, 2009b) have amassed some evidence for the key factors for regional growth and the benefits associated with an integrated territorial approach. This publication allows us to illustrate these broad recommendations with more concrete examples and to provide evidence for areas of likely complementarities.

As discussed in Chapter 1, the OECD has for some time been promoting a new paradigm in regional policies which consists of shifting from temporal subsidy-based policies to a portfolio of integrated and co-ordinated investments aimed at mobilising the endogenous resources and assets within regions. A key element in this new paradigm is a multidimensional approach which consists of integrating, co-ordinating and synchronising these endogenous factors with pro-growth policies, adequate institutions and governance mechanisms so as to avoid potential unintended consequences typically driven by actions taken in isolation ("silo actions"). For example, in Figure 3.47, Panel A shows how improving human capital through training without complementary policies to ensure jobs are created can lead to loss of skilled workers from the region (brain drain). Similarly, Panel B shows how tackling a single problem – poor connectivity by providing good external transport links – can

cause human capital to leave the region if not accompanied by other policies to provide them with jobs locally (the leaking-by-linking effect) (OECD, 2009b).

Figure 3.47. **How isolated policies can entrench poor growth**



This section aims to improve our understanding in this area by mapping all the growth factors together in order to identify common patterns in the growing group of regions that can reveal systemic effects and potential areas of complementarities and synergies. We apply the same approach to the bottlenecks among the non-catching up group of regions, to identify commonalities in these regions.

The case studies also shed some light on the importance of an integrated approach to policy and how different strands of policy can complement – or undercut – each other. For less developed and intermediate regions that were on a convergence trajectory, for example, the most common formula for success appeared to be a simultaneous improvement in horizontal co-ordination of policies, regional institutional capacities, infrastructure provision and human capital development (Table 3.32). This suggests that there may be strong synergies among these critical pillars.

In around one-third of the sample, a simultaneous improvement in infrastructure, the business environment (particularly when linked to regulatory reform) and "geographic factors" is observed. The last of these, of course, is exogenous, though it serves as a reminder that, in an economic sense, a region's "location" may improve (or deteriorate) as a result of developments like the formation of NAFTA or the enlargement of the EU. Such events can improve or reduce a region's access to major markets independently of any changes in connective infrastructure or travel time or costs. Thus, regions enjoying an improvement in their "geographic" conditions were able to reap the benefits of their location by simultaneously improving infrastructure and the business environment.

This also serves as a reminder that, while many of the key growth drivers are endogenous to regions, not all of them are. Skill in adapting to changes in the external environment can be a great asset in itself, and a lack of adaptive capacity has been identified in several of the case studies as a significant bottleneck.

Bottlenecks can also come in packages, but these are less clear cut (Table 3.33). The study found simultaneous problems with policy frameworks, infrastructure provision and connectivity in three regions. Three others were characterised by inadequate institutions and labour market fragmentation, which might suggest a link between the two. Moreover, the quality of institutions emerged as a key issue in both successful and under-performing regions – institutional bottlenecks were identified in nine case studies and improvements to institutions cited as factors supporting growth in eight others. Thus, governance matters.

Perhaps the most striking feature of the case studies is that the commonalities observed among successfully converging regions are far more apparent than those among regions that are losing ground. The latter are characterised by greater variety of conditions with respect to the variables under study. In fact, this is not surprising: to achieve catch-up growth, regions must successfully address a range of different challenges; deficiency in any one may be sufficient to thwart them. There are thus more "recipes" for failure than for success. This does not, however, mean that there are "one size fits all" formulae for growth: on the contrary, some policy challenges are common to all regions, their very different circumstances mean that they must tackle them in their own ways.

Table 3.32. **The benefits of getting policies right in several critical areas: Evidence from the case studies**

	Policies [a]	Human capital	Infrastructure and connectivity	Business environment [c]	Geography	Institutions [b]	Innovation	Social factors	Internationalisation and attractiveness	Natural assets and amenities	FDI	Economy [d]	Tourism
Jalisco	x	x	x			x			x				
Asturias	x	x	x			x							
Brandenburg	x	x	x										
Durango	x	x	x							xx			
San Luis Potosi	x	x	x	x	x								
Sachsen-Anhalt	x	x	x	x	x						x		
Wielkopolskie			x	x	x	x		x	x			x	
Central Transdanubia			x	x	x						x		
Zuid-Nederland	x					xx	x						
Marche				x		x	xx						
Midi-Pyrénées		x					x		x				
Aquitaine	x						x						x

Notes: [a] Policies = a shift in mentality from subsidies to pro-growth, policy "silos", fragmentation, adjusting policies, linkages, urban and spatial; [b] Institutions = governance, leadership capacity, continuity, mobilisation; [c] Business environment includes public sector activity and industry; [d] Economy = diversified, differentiated and market aware economy.

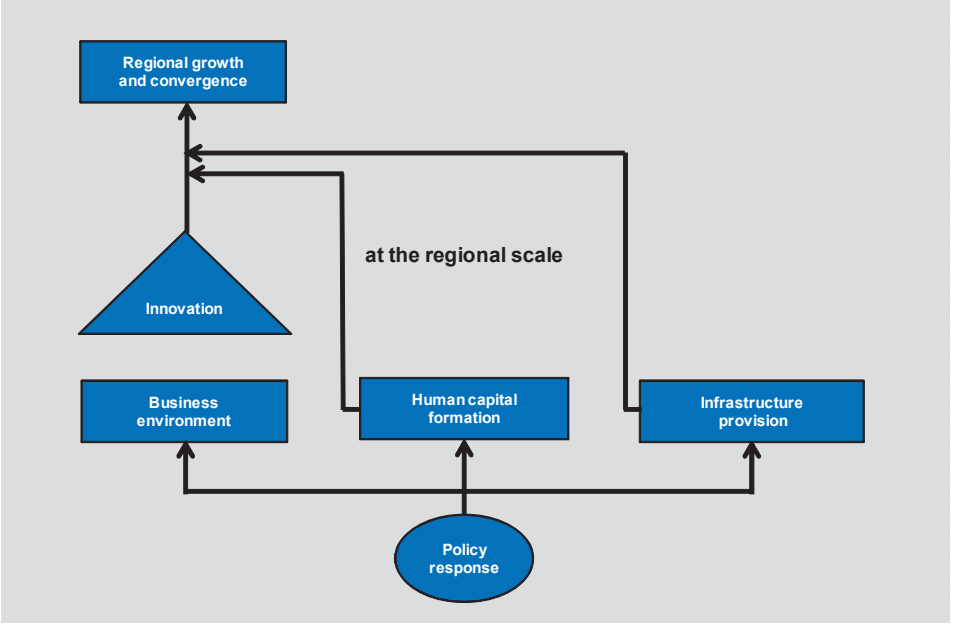
Table 3.33. **Common bottlenecks in regions with below average growth**

	Policies [a]	Infrastructure and connectivity	Human capital	Institutions [b]	Density [a]	Business environment, public sector activity and industry	Innovation and entrepreneurship	Geography	Social factors	Economy [c]	Demography	Agriculture	Environmental constraints
Lubelskie	X	x						x				x	
Podlaskie	xxx	x		x	x			x					x
Východné Slovensko	X	x	x					x					
North East (Tyne and Wear)				xx	x	x							
North West (Manchester)				x	xx								
Yorkshire and Humberside (Leeds)			x	x	x					x			
Estado de México	X		x								x		
Nord-Pas de Calais			x				xx	x					
Chiapas		x	x		X			x	x				
Zacatecas			x		X	x					x	x	
Sicily	X			xxx		x					x		

Notes: [a] Policies = a shift in mentality from subsidies to pro-growth, policy "silos", fragmentation, adjusting policies, linkages, urban and spatial; [b] Institutions = governance, leadership capacity, continuity, mobilisation; [c] Economy = diversified, differentiated and market aware economy.

While this implies a constraint in terms of policy coherence, it also points to opportunities arising from policy complementarities. Figure 3.48 shows how a multidimensional policy response can pull all the threads together to result in regional growth.

Figure 3.48. **Towards a multidimensional response**



To sum up, policies that seek to foster growth in less developed regions make good economic sense. Such regions can and often grow strongly. This benefits national performance, while strengthening both resilience and equity. Yet catch-up growth cannot be achieved via a top-down, subsidy-based approach. It requires a co-ordinated effort at regional level to identify local assets and remove the policy impediments and other barriers to their mobilisation. A mix of top-down and bottom-up initiatives is therefore needed, and the case studies suggest that success is most likely when the bottom-up element is strengthened.

This is because designing the kind of policy package most likely to unlock a region's potential will require information that is available only in the region itself. An understanding of the growth factors and constraints that tend to matter at different levels of development, such as those discussed above, should help policy makers identify the kinds of questions they need to ask and the kinds of initiatives that might help.

For example, where an advanced region might prioritise R&D and innovation support, a less developed region might focus first on an absorption/adoption strategy, developing human capital and improving the business environment rather on science-based innovation. This must be an exploratory, bottom-up learning process. Regions can learn from one another, but they will rarely be able simply to imitate others' success or follow a pre-defined formula. Ultimately, there is no substitute for self-discovery.

Notes

1. The case studies were selected and financed by the European Commission and authorities from Mexico, Poland and the United Kingdom.

2. The only exception was in the six case study regions in Mexico due to logistical constraints. Rather than travelling to all six regions, OECD analysts travelled to Mexico City and interviewed policy makers from the six regions and conducted the mission trips via teleconference with each of the six regions.

3. Economic activities connected to the elderly population.

4. This case study employs as unit of analysis the administrative boundaries of the region, rather than the functional area of Berlin. This suggests that some of the analysis may suffer from biases due to differences between place of work and place of residence.

5. "German Unity Transport Projects" are large-scale construction projects to establish transport links between East and West Germany.

6. Transfers from Solidarity 1995-2019 amount to EUR 30 billion. This amount will gradually be phased out over time. The region received EUR 1.5 billion a year from 1995-2004 and currently this amount is reduced to EUR 1 billion annually.

7. According to the Commission for the Development of Indigenous Peoples there are 11 types of indigenous groups. The political constitution in Chiapas recognises 9 indigenous groups.

8. The region's cultural heritage should not be interpreted as a bottleneck for development or an impediment to implementing change. Over the past five years traditional methods combined with innovative practices have added value to local products in the region and assisted various SMEs in the region to implement and learn modern commercial practices.

9. In 2009 Chiapas adopted the UN Millennium Development Goals in its constitution, bringing profound changes in public policies aimed at embracing economic development, social and cultural goals.

10. In 2010, 88.3% of children between 6 and 14 years attended school in the 28 municipalities with the lowest human development index in the region, representing 9 out of 10 children. This percentage rose from 77.7% (in 2000) to 85.8% in 2005 and finally to 88.3% in 2010. Source: Census of Population and Housing, 2010.

11. In 2010 the percentage of illiterate inhabitants above 15 years of age decreased by 3.5 percentage points compared to 2005. Source: Census of Population and Housing, 2010.

12. *Maquiladora* is the Mexican name for manufacturing operations in a free trade zone (FTZ), where factories import material and equipment on a duty-free and tariff-free basis for assembly, processing, or manufacturing and then re-export the

assembled, processed and/or manufactured products, sometimes back to the raw materials' country of origin.

13. This case study uses as its unit of analysis the administrative borders of Estado de México, while recognising its limitations given that the region is part of the catchment area of the Distrito Federal. As a result, some of the analysis may suffer from biases due to differences between people's place of work and place of residence.

14. Our measure of productivity (GDP per employee) considers all types of workers in the labour force, due to data availability at the regional level. Our measure does not distinguish between paid workers, unpaid workers and self-employers. A productivity measure based on paid workers for Estado de México would yield a higher measure of productivity due to the large population influx in the region composed of paid and unpaid workers.

15. The employment rate is defined as the proportion of the working age population with employment. The definition of employment does not include unpaid employment and is based on INEGI's definition.

16. Patent data might be biased in the region of Estado de México given the large number of lawyers working in the neighbouring region of Mexico Distrito Federal where many patents are recorded.

17. The electronics industry in Jalisco started around the 1960s with the operation of branches of some multinational enterprises. After the enforcement of NAFTA, the sector experienced a new boom based mainly on investments by contract manufacturing enterprises (CM) in assembly operations of PCs – due to a reorganisation at the global scale – in which high value-added activities such as R&D, marketing and basic components manufacturing became distinctly separated in their location from low value-added activities such as assembly operations. The great majority of these assembly operations fled to China several years later, giving rise to a new development phase. This involved restructuring PC enterprises towards distribution and logistics and specific final assembly activities. The region's facilities also specialised in the assembly of PCs in small batches or on order for the North American market.

18. Combined, triple helix innovation is a process by which academia, government, and industry collaborate (i.e. engage in a process of mutually beneficial leveraging of resources) to create or discover new knowledge, technology, or products and services to fulfil a social need.

19. Indicators measure accessibility to potential markets in travel time by two modes of transportation using an inverse weighted GDP matrix to all EU regions. The weighting rule applies the inverse distance for travel time by each mode of transportation. Potential road and rail access thus measure the travel time from one region to all other regions in the EU.

20. These figures correspond to the functional areas and are only available in the national currency, rather than in PPP dollars.

21. Art. 70 GGff.

22. "German Unity Transport Projects" are large-scale construction projects to establish transport links between East and West Germany.

23. The GRW are instruments of regional policy with the goal to improve economic infrastructure and support balanced regional development among the federal states. It is a shared responsibility of the Bund and Länder; see Art. 91a GG.

24. As regards legislative functions, the Constitution states that the regions (with ordinary or special status) hold exclusive competences for: local development (industry, commerce, handcraft, tourism), agriculture, mining, water resources, hunting, housing and city planning, regional networks of transport, public transport, regional administration, regional public order and safety, vocational training, social services. In other fields, the competences of the regions are shared with the state, which establishes the general principles enabling the regions to develop detailed legislation (international and EU relations, foreign trade, safeguards and work security, R&D, health care protection, civil protection, territorial planning, civil ports and airports, large transport networks infrastructures, harmonisation of public account and co-ordination of public finance and the taxation system, energy, education, supplementary social security, local credit institution, enhancement of cultural and environmental assets).

25. The districts must be composed of an agglomeration of companies from the same sector and a complementary set of institutional actors (universities, research institutes and higher education, government, etc.). The general organisation of the district must reproduce the production chain as a horizontal or vertical, being essential for its recognition a certain number of companies (not less than 150), a high degree of integration within the supply chains. and a high capacity for technological innovation (production processes, presence of leading companies and educational institutions, etc.).

26. GVA *per capita* is not available for Leeds City Region or individual local authorities; data from the Regional Econometric Model can be used to measure output *per capita* for these areas. The data set is from a different source to those used to calculate GVA and GVA *per capita*. It is also important to note that the output *per capita* figures for the City Region are residence-based and not workplace-based which may account for the some of the difference from figures at NUTS 3 level (Yorkshire and Humberside) which has a GVA *per capita* figure of GBP 16 114 in 2007 compared with GBP 19 413 for England (1998 figures GBP 11 623 and GBP 13 482 respectively).

27. Strengthening Economic Links between Leeds and Manchester, SERC/LSE, Northern Way November 2009.

28. Leeds City Region Development programme.

29. Combined triple helix innovation is a process by which academia, government, and industry collaborate (i.e. engage in a process of mutually beneficial leveraging of resources) to create or discover new knowledge, technology, or products and services to fulfil a social need.

30. Disaggregated manufacturing data are not available. This share also includes activities for mining and quarrying, electricity, gas and water supply.

31. The region expects the highest labour shortages for people with vocational education. Due to the large, high-tech production facilities (ASML, DAF, VDL, FEI including their suppliers), the region needs numbers of craftsmen, well-educated, but not highly-skilled in statistical terms.

OECD Regional eXplorer can be found at *http://stats.oecd.org/OECDregionalstatistics/*.

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Annex 3.A1

Categorising the growth factors and bottlenecks

This annex categorises the combined 185 factors of growth and bottlenecks from the case studies into 18 thematic areas. Although some factors for growth and bottlenecks could be assigned to more than just one thematic area, our correspondence is made on a one to one basis and for these cases we assign and select the most relevant thematic area. Table 3.A.1.1 displays the correspondence.

Table 3.A1.1. **Codifying growth factors and bottlenecks into thematic areas**

Themes	Factors and bottlenecks	Region
1. Agriculture	Agriculture activity remains an important economic activity	Zacatecas
	Inability to restructure an existing low productive agriculture sector	Lubelskie
	The modernisation of agriculture has been moderate	Zacatecas
2. Availability of financing	Limited investment resources available to enterprises	Wielkopolskie
	Lack of public funding to strengthen the knowledge infrastructure	Zuid-Nederland
	Weak access to credit and venture financing	Marche
3. Business environment, public sector activity and industry	Attractive business environment	Wielkopolskie
	Strong presence of industry and industrial related activities	Sachsen-Anhalt
	Strong private sector involvement in the manufacturing tradition	Marche
	Strong involvement of the business sector combined with a strong "work ethic" culture	Central Transdanubia
	Limited local business capacities	San Luis Potosi
	Favourable regulatory environment and policies supporting private sector activities	San Luis Potosi
	Strong presence of the private sector driving the diversification of the economy	Yorkshire and Humberside (Leeds)
	Important concentration of clusters and poles of competitiveness	Nord-Pas de Calais
	Presence of a significant number of larger firms driving the manufacturing cluster	Estado de México
	Insufficient involvement of the private sector in R&D	Asturias
	Red tape and regulatory burden	Central Transdanubia
	Insufficient integration of value chains in mining and wood sectors to produce higher value-added goods	Durango
	Low competitiveness in the private sector and lack of dynamism driving brain drain of young, productive talent	Sicily
	Low involvement of the private sector leading to excessive reliance on public sector activities	North East (Tyne and Wear)
	Low industrial activities focusing mainly on low-value added activities.	Zacatecas
4. Demographic factors	Population declines and an excessive elderly population	Asturias
	Long-term population decline	Brandenburg
	Population declines in the region	Sachsen-Anhalt
	Demographic trends bring challenges to public investments and represent a loss of human capital potential	Durango
	Ageing population bring important challenges to the region	Sicily
	High population growth in the region.	Estado de México
	High levels of outmigration	Zacatecas

Themes	Factors and bottlenecks	Region
5. Density and cohesion (internal fragmentation, labour market mismatch)	Fragmentation in labour markets reduces its growth potential and brings important challenges to governance	Midi-Pyrénées
	Lack of internal cohesion due to strong internal fragmentation.	Podlaskie
	Mismatch in skills between demand and supply	North West (Manchester)
	A fragmented labour market area due to poor connectivity within the functional city region	North West (Manchester)
	Improving internal connectivity critical for polycentric settlement	Yorkshire and Humberside (Leeds)
	Low critical mass due to fragmented internal markets and weak internal connections	North East (Tyne and Wear)
	Economic activities in Chiapas are highly fragmented with low links impeding spillover and scale-effects	Chiapas
	Low participation of females into the workforce	Zacatecas
6. Diversified and differentiated economy with market awareness	Differentiated base for economic development.	Wielkopolskie
	Internal demand for goods and services by small firms	Lubelskie
	A relatively diversified economic structure	Yorkshire and Humberside (Leeds)
	Diversification of traditional sectors	North East (Tyne and Wear)
	Growth of the service sector during on ongoing period of restructuring	Nord-Pas de Calais
	Small proportion of large scale companies in the region	Brandenburg
	Insufficient size and death of industrial enterprises.	Aquitaine
	Low diversification and reliance on agriculture and natural resource brings vulnerable to external fluctuations	Durango
	The region lacks market awareness despite the economy having size and scale	Yorkshire and Humberside (Leeds)
7. Environmental constraints	Exclusion of large parts of the region from economic activities due to environmental constraints.	Podlaskie
8. FDI	Largest recipient of FDI in eastern Germany	Sachsen-Anhalt
	Strong influx of FDI to the region and strong presence of foreign investors	Central Transdanubia
	FDI investment in the region have been quite significant	Estado de México
9. Geography	Favourable location in relation to EU markets and central location in the country	Wielkopolskie
	Favourable geographic location and proximity to core European markets	Sachsen-Anhalt
	A favourable geographic position	Central Transdanubia
	Has taken advantage of its good geographic location	San Luis Potosi
	Proximity to the Eastern border	Lubelskie
	Central geographic location with proximity to London	Yorkshire and Humberside (Leeds)
	Proximity to the main production consumer hub in Mexico	Estado de México
	Unfavourable geographic location on the periphery of the EU border	Podlaskie
	Unfavourable geographic location on the largely impermeable EU external border	Lubelskie
	Geographic location peripheral to Western markets, separated by from the capital region by mountainous terrain	Východné Slovensko
	Privileged geographic location close to Brussels, Paris and London albeit not fully translated into economic gains	Nord-Pas de Calais
	Terrain, not conducive to productivity gains, hampering development efforts	Chiapas
10. Human capital	Reduction of low-skilled workers improved stock of technical students and more response to the demands of market	Asturias
	Adequate and continued supply of skilled workers matching the market needs	Brandenburg
	Very high research potential due to the tertiary sector brings a very high research potential to the region	Midi-Pyrénées
	Abundant labour force with human capital technical skills in the surging sectors	San Luis Potosi
	Ability to transform its economy to higher value-added goods through human capital gains	Jalisco
	Gains in human capital improving adult skills and vocational training adding to the region's capacity	Durango

Themes	Factors and bottlenecks	Region
10. Human capital *(cont.)*	Adequate higher educational facilities have brought important human capital potential to the region	Podlaskie
	Adequate levels of human capital in higher education	Lubelskie
	Higher education institutions supply a diversified pool of highly skilled workers	North West (Manchester)
	Critical mass in human capital due to a notable concentration of higher education institutions	Yorkshire and Humberside (Leeds)
	Strong higher educational programmes and institutions	North East (Tyne and Wear)
	Higher education institutions attracting students and improving supply of highly skilled workers	Nord-Pas de Calais
	Inflexible education system which is not adjusted to real needs,	Wielkopolskie
	Availability of talent is falling behind the growing demands of the region	Zuid-Nederland
	Brain drain in highly skilled workers represents a loss of human capital potential	Sachsen-Anhalt
	High proportion of low-skilled workers and weak links between educational and business sector	Central Transdanubia
	Gaps between human capital and the needs of the region.	Jalisco
	Brain drain due to insufficient industrial production	Východné Slovensko
	Labour market capacity and skills in selected areas would add to the region's economic capacity	Yorkshire and Humberside (Leeds)
	Loss of human capital potential for future generations with high dropout rates and low secondary attainments	Nord-Pas de Calais
	An important lack of human capital and loss of human potential	Chiapas
	Deficit of highly skilled labour	Estado de México
	Inadequacy of educational level and low availability of jobs-skill in the region	Zacatecas
11. Infrastructure connectivity	Infrastructure improvements connecting a relatively closed region to external markets	Asturias
	Adequate infrastructure facilities providing good external connections to the east and west	Wielkopolskie
	Adequate infrastructure investments improved connectivity to European and international markets	Brandenburg
	Important improvements in infrastructure have attracted logistic companies to the region	Sachsen-Anhalt
	Fairly advanced infrastructure network has strengthened connections to Budapest and to European markets	Central Transdanubia
	Adequate infrastructure has helped consolidation of an important logistics hub around the metropolitan zone of San Luis Potosi	San Luis Potosi
	Adequate transport infrastructure capitalising on the region's privileged geographic position	Jalisco
	Road and rail infrastructure and adequate geographic location	Durango
	Important improvements in the transport infrastructure networks	Sicily
	Capital deepening brought by investments in physical capital in the city centre	North West (Manchester)
	Infrastructure gains modernising the port, railways and airport have benefited the region over the past decades	Chiapas
	Uneven development of transportation infrastructure with limited accessibility in some parts of the region	Wielkopolskie
	Gaps in ICT infrastructure limits the capacity to disseminate innovation around industrial clusters	Marche
	Connectivity gaps between the metropolitan area San Luis Potosi and the ports of Tampico-Altamira	San Luis Potosi
	Inadequate logistics infrastructure failing to give greater impetus to the region	Durango
	Inadequate infrastructure in the region, which lacks an airport and adequate road and rail infrastructure	Podlaskie
	Limited transport network lacking motorways and ring roads; the railways and local roads are inefficient	Lubelskie
	Inadequate infrastructure with low motorway density and limited connection between cities and with external markets	Východné Slovensko
	Inadequate infrastructure still represents an important bottleneck for development	Chiapas
	Strong open innovation value chains with a strong involvement of the private sector	Zuid-Nederland

Themes	Factors and bottlenecks	Region
12. Innovation, including entrepreneurial	Entrepreneurial tradition in the region	Marche
	Ability to turn around traditional sectors through innovation-intensive initiatives	Marche
	Strong research capacity, mainly centred in Gironde	Aquitaine
	Innovation intensity driven by steady growth of the aerospace cluster and active innovation-driven policy	Midi-Pyrénées
	Small-scale examples of innovative policy	Sicily
	Low appliance of research and scientific potential, and relatively low funding of R&D, especially in enterprises	Wielkopolskie
	The application of technology to the region's natural amenities has brought important gains	Chiapas
	A low entrepreneurial spirit	Asturias
	Slow pace of further modernisation of regional economy	Wielkopolskie
	Bottlenecks in further unleashing innovation potential and creating more economic value of existing innovations	Zuid-Nederland
	Low level of overall R&D investment especially by the business sector	Brandenburg
	Low innovation capacity due to lack of company headquarters and obstacles to enhancing links between university and business	Sachsen-Anhalt
	Low innovation due to few connections between large firms and SMEs and weak links between HED and business	Central Transdanubia
	Insufficient integration of the region's regional innovation system	Aquitaine
	Low entrepreneurial culture along with anti-manufacturing sentiment	Aquitaine
	Decline of low tech-activities (textiles, leather, wood processing) in a number of rural areas	Midi-Pyrénées
	A lack of entrepreneurial culture especially in traditional sectors and smaller firms	Jalisco
	Persistent weakness of R&D investments and low involvement of the private sector in R&D activities	Nord-Pas de Calais
	Limited entrepreneurial culture and low private initiative	Nord-Pas de Calais
13. Institutions (governance, leadership capacity, continuity, mobilisation)	Mobilising key actors by reaching agreements in a region with a strong legacy of conflict	Asturias
	Institutional arrangements supporting economic development	Wielkopolskie
	A successful turnaround driven by mobilising key actors and stakeholders in the region	Zuid-Nederland
	Single regional voice and strong position	Zuid-Nederland
	Active role by key local public and private actors focusing on innovation and workforce development/retention	Marche
	Mobilising stakeholders in the regions through enhanced dialogue and interactions among key stakeholders	Jalisco
	Institutional arrangements supporting economic development	Podlaskie
	Coherence and continuity in governance	North West (Manchester)
	Important gaps in of multi-level governance	Podlaskie
	Lack of political vision to change traditional, entrenched interests vested in the status quo in the region	Sicily
	Institutional capacity building should be improved in terms of organisational efficiency and use of human capital	Sicily
	Inability to define and apply performance-based indicators	Sicily
	An excess of programmes too thinly spread	North West (Manchester)
	Lack of effective mobilisation of all key stakeholders in the region	Yorkshire and Humberside (Leeds)
	Inability to fully mobilise key actors in the region and accelerate a shift towards growth potential	North East (Tyne and Wear)
	Lack continuity in governance and in policy design brought by institutional stability	North East (Tyne and Wear)
14. Internationalisation (international competition, brand name attractiveness)	Internationalisation of regional economy	Wielkopolskie
	High international exposition	Midi-Pyrénées
	Adequate brand name of Guadalajara	Jalisco
	Mobilising the region's natural environment and resources, changing image from typically rural to relatively attractive	Podlaskie
	Improvements to the Sicily brand	Sicily

Themes	Factors and bottlenecks	Region
14. Internationalisation (international competition, brand name attractiveness) (*cont.*)	Low wage costs attracting foreign investments	Východné Slovensko
	The region's brand name has brought positive gains	Chiapas
	The region's attractiveness has been an important driver of population and FD investments	Estado de México
	International appeal and brand name of the region	Zuid Nederland
	Vulnerability to global competition especially in traditional sectors with low levels of innovation	Marche
	Enhanced competition by Asian importers in wood and wood-related activities in the internal markets	Durango
15. Other	Favourable social determinants for economic development	Wielkopolskie
	Flows of remittances from migrants living outside the region	Zacatecas
	Balancing traditional culture and social policies with development efforts.	Chiapas
16. Policies (shift in mentality, silos fragmentation, adjusting policies to assets, linkages, cross border, urban and spatial)	Transitioning from being less reliant on external subsidies and more on growth potential	Asturias
	Continuity in policy programmes and goals resulting in a shift from exogenous-based programs to internal ones	Zuid-Nederland
	Mentality and policy shift from a focus on subsidies to towards growth potential	Brandenburg
	Gradual change of mentality making region less dependent on external interventions and more on internal ones	Sachsen-Anhalt
	The regeneration of the city centre of Bordeaux through urban and spatial planning	Aquitaine
	Linkages between firms and universities have been improved in recent years	San Luis Potosi
	Urban development in the metropolitan area of Guadalajara has been an important driver in the region	Jalisco
	Cross-regional linkages with its neighbouring region of Coahuila	Durango
	Adjusting of economic activities to the region's assets and its environmental constraints.	Podlaskie
	Enhancing links with Belarus and Lithuania brought benefits to the region's proximity to eastern borders	Podlaskie
	Good border co-operation	Východné Slovensko
	The regeneration in the city region has brought important economic benefits	North East (Tyne and Wear)
	Urban dynamism, mainly in the capital city of Lille	Nord-Pas de Calais
	Inefficiency of selected policies supporting development undertakings	Wielkopolskie
	Further enhance cross-border co-operation with regions in Germany and Belgium	Zuid-Nederland
	Spatial planning, particularly urban planning, remains underdeveloped	Midi-Pyrénées
	A culture of low co-operation due to initiatives lacking yield low inter-firm co-operation	San Luis Potosi
	Problem of urban development lacking an efficient urban system	San Luis Potosi
	Lack of effective territorial co-ordination due to high sectoralisation of national policies and lack of leadership	Jalisco
	Inadequate integration of the region into spatial and functional structures at supra-regional and national level	Podlaskie
	Increased commuting and congestion costs represent important bottlenecks to the Guadalajara metropolitan area	Jalisco
	Insufficient links between educational institutions and local and regional business activities	Podlaskie
	Inefficiency of selected policies supporting development undertakings	Podlaskie
	Inadequate integration of the region into spatial and functional structures at the supra-regional and national level	Lubelskie
	Difficulty in creating a paradigm shift toward growth potential	Sicily
	Unfavourable policy environment	Východné Slovensko
	Slow reaction by the region to external shocks and slow implementation of structural transformation	Estado de México
17. Presence of natural assets and amenities	The presence of natural resources and improvements in infrastructure and proximity to northern markets	Durango
	The establishment of the nation's largest dairy clusters in the north of Mexico	Durango
	Natural tourism has been an important driver of the region's value-added	Chiapas
	The presence of mineral and mineral activities	Zacatecas
18. Tourism	Tourism development has been an important driver in the region	Aquitaine
	Tourism development	Východné Slovensko

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