

## Chapter 2. Thinking global, developing local: Tradable sectors, cities and their role for catching up

*The key challenge for policy is how to sustain aggregate growth while promoting catching up of lagging regions and job creation at the same time. This is a daunting challenge as there are some clear trade-offs outlined in Chapter 1. This chapter considers two important characteristics of regions that support catching up in terms of labour productivity.*

## Chapter synopsis

Regions that were able to narrow the productivity gap with their country's most productive "frontier" region distinguish themselves from regions that were further diverging from the frontier in two important characteristics. These characteristics are a strong and growing tradable sector and the presence of well-functioning cities.

In European regions that were catching up, tradable sectors contributed, on average, about 37% of the total output in the region in 2000 and this percentage increased even further to nearly 40% in 2014. In contrast, diverging regions started with a lower percentage of gross value added (GVA) in tradable sectors in 2000 than catching-up regions and the contribution of tradable sectors had not increased by 2014. In tradable sectors – those that could be traded – growth and success of the firm is not limited by the size of the local market, at the same time firms in tradable sectors are exposed to international competition and need to be dynamic and innovative to succeed.

A breakdown of the productivity dynamics in regions shows that in the tradable sector, increasing productivity was based on improvements by firms within the sector and region over the 2000-13 period. For non-tradable sectors this within-sector and region improvement accounts for only half the growth, the other half was due to shifts of employment from less to more productive non-tradable economic activities.

Manufacturing is still a key element of the tradable sector, but tradable activities are not limited to manufacturing. Tradable services accounted for 15% of total regional output in 2013 and they had the highest growth rates – more than 2.5% per year between 2000 and 2013 in most European regions. Yet, many regions are not taking advantage of this potential. In European regions with the lowest per capita GDP levels and growth rates, tradable services grew by a mere 1% annually between 2000 and 2013.

A focus on tradable sectors might be seen to increase the exposure to global shocks and risks the jobs and livelihoods of people in a region. The experience of European regions before and since the 2007-08 crisis shows that the opposite is the case. On average, employment grew by about 0.7% annually between 2008 and 2014 in regions that experienced only small shifts in employment to the non-tradable sector before the crisis. In contrast, regions that experienced strong shifts experienced an average decline in employment of nearly 1% and the 10% of regions with the largest pre crisis shifts also experienced the strongest post crisis employment losses (2.9% annually).

Well-functioning cities contribute to productivity dynamics through different channels. They attract more tradable services and high-tech manufacturing activities, whereas rural areas tend to specialise in mature manufacturing sectors and resource extraction. Business creation tends to be most dynamic in a country's region that includes the largest or capital city. An important reason for these patterns and for productivity differences within a country are so-called "agglomeration economies".

The positive economic impact of a city does not need to be constrained by its limits but is often measureable well into a city's surroundings. By linking rural regions and cities, policies can make an important difference in the degree to which they can harness the benefits of agglomeration economies. These links include physical transport connections but are not limited to them. Large cities also come with pecuniary and non-pecuniary "agglomeration costs". Congestion, environmental degradation, high housing prices and other downsides from agglomeration partially offset the productivity gains from agglomeration and reduce the well-being of urban residents.

## Two key factors in narrow the regional productivity gap within countries

### *Tradable sectors are associated with successful catching up*

The first factor is tradable activities' relatively large contribution to the regional economy. Tradable sectors are those that produce goods or services that can be traded across regions and international borders. The analysis in this chapter does not focus on actual trade, which will be covered in Chapter 3. Instead, the following sections consider economic activities that could be traded irrespective of whether such trade actually takes place.

At the regional level this distinction between traded and tradable is often academic. Those sectors that are tradable typically engage in some trade. But it acknowledges that firms can operate in sectors that are tradable without actually engaging in trade themselves. Even without selling their goods and services abroad, firms in tradable sectors are exposed to competition from abroad. Farmers selling their produce on local markets compete with the supply from other regions or countries, a programmer working for a local company needs to provide a better service than those that can be purchased cheaply on global platforms, or a carpenter needs to offer furniture that meets local needs better than the furniture available at global furniture chains.

What unifies trade and tradability is hence the need to be competitive in a global environment. Competitiveness is a diffuse term that is often solely focused on “cost competitiveness”, i.e. producing a given amount of output at costs that are on par with those in other regions or countries. This view can easily lead to an excessive focus on cost savings, e.g. by limiting wage growth. But this is a view that is too narrow. Competitiveness can also be enhanced by using technology to improve production, developing new markets and products, and rethinking the way goods are produced.

### *Well-functioning cities support productivity within their limits and beyond*

The second characteristic associated with catching up is a well-functioning link between cities and regions. Through “agglomeration benefits”, firms and workers are more productive in larger (and denser) cities than they would be in smaller cities or rural areas. Agglomeration benefits arise, in part, when firms gain access to a larger market for their goods and services. Firms can increasingly specialise as the size of the local market increases, which raises their productivity.<sup>1</sup> It also allows workers to find jobs that better match their skills, and firms to fill vacancies with better suited candidates, i.e. those that will be the most productive in the job. A third channel relates to the potential for more frequent interaction between people and firms. The knowledge gained and shared in talking to other people or in discovering other firms' innovations and techniques can help companies generate new ideas, products or processes, which they can leverage to become more productive.

“Agglomeration benefits” are not necessarily limited to the borders of a city. Firms in the surrounding rural areas can access lawyers, marketing specialists or logistics services in larger cities. Rural areas, within easy commuting distance from large cities, provide an alternative to dense urban living and can attract firms through lower land prices while providing access to the large pool of workers the nearby city provides. The strength of these links depends on local infrastructure and integration of the main city with its surrounding area.

## Tradable sectors are associated with successful catching up

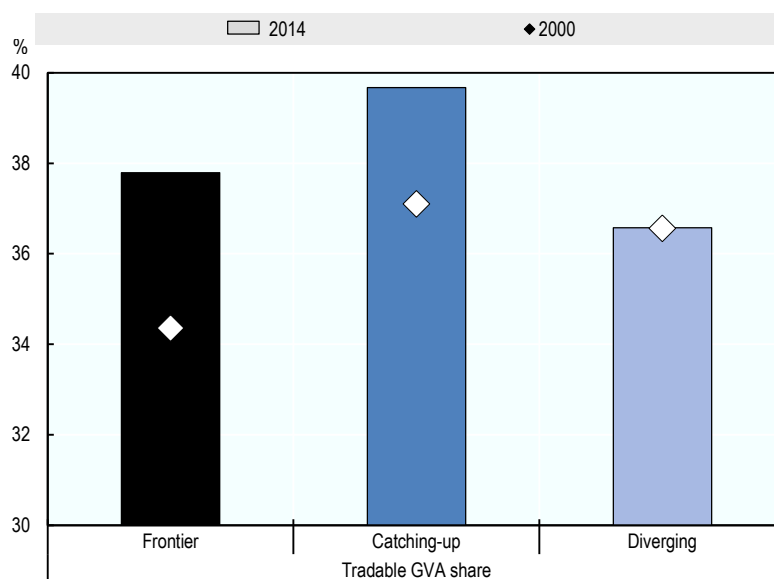
Many regions that were lagging behind the most productive “frontier” regions in their country were able to narrow the gap between 2000 and 2014. The OECD Regional Outlook 2016 considers a range of possible characteristics that support this “catching-up” process (OECD, 2016<sub>[1]</sub>). Few characteristics distinguish regions that were narrowing the gap from those that fell further behind their country’s frontier region(s),<sup>2</sup> but one important feature appears to be the contribution of tradable sectors to overall economic production (Figure 2.1). In European regions that were catching up, tradable sectors accounted for, on average, about 37% of the total output in their respective region in 2000 and this percentage increased even further to nearly 40% in 2014. In contrast, diverging regions started with a lower percentage of gross value added (GVA) in tradable sectors in 2000 than catching-up regions and the contribution of tradables had not increased by 2014.

The growth in contribution to total output is, however, not accompanied by an increase in the contribution to total employment. In fact, in both types of regions, i.e. those catching up to and those diverging from the frontier, the number of employees in tradable sectors has declined as a percentage of overall employment, on average (OECD, 2016<sub>[1]</sub>). The share of tradable sectors in employment is initially smaller than its contribution to GVA and did not follow the increase (or stagnation) of the contribution to total output. This implies that tradable sectors were not only more productive than non-tradable sectors in 2000, their productivity advantage increased further.<sup>3</sup> This increasing gap between tradable sectors that raise productivity (and thereby wages) and non-tradable sectors that create jobs poses a challenge for sustained growth in the region (as outlined later in this chapter, in the section entitled, “Is a large tradable sector more risky for a region?”). It also raises the concern that income inequality will (further) increase.<sup>4</sup> As sustainable wage growth is tied to productivity growth, the divergence in productivity will also be reflected in income divergence.

In some cases, the decline in employment is concentrated in particular sectors or regions. In Korea, for instance, employment in agriculture across all regions fell by 26% between 2008 and 2014, while output remained constant, reducing the number of jobs in the sector by more than half a million.<sup>5</sup> The total output in the sector slightly increased, but job losses were only partially compensated by an increase in other tradable sectors (e.g. manufacturing). The largest increases in employment in Korean regions were in public services (public administration, health, social affairs and education) and retail, transport and hospitality services, but skills required for agricultural work are not necessarily transferable to activities in these sectors and workers might find the shift towards new opportunities difficult or even impossible, especially while retaining a decent wage (also see the section below, “Successful sectoral transitions require skills, ideas and stamina”).

**Figure 2.1. Economies in “catching-up” regions are more focused on tradable sectors**

Contribution of tradable sectors to gross value added and employment in TL3 regions



*Note:* Catching-up/diverging regions grew by at least 5 percentage points in 14 years more/less than their national frontier over the 2000-14 period. The frontier is defined as the aggregation of regions with the highest GDP per worker and representing 10% of national employment. Due to lack of regional data over the period, only 22 countries are included in the averages. Tradable sectors are defined by a selection of the 10 industries defined in the SNA 2008. They include: agriculture (A), industry (BCDE), information and communication (J), financial and insurance activities (K), and other services (RSTU). Non-tradable sectors include construction, distributive trade, repairs, transport, accommodation, food services activities (GHI), real estate activities (L), business services (MN), and public administration (OPQ).

*Source:* OECD (2016<sub>[1]</sub>) and OECD Regional Statistics [Database].

*StatLink*  <http://dx.doi.org/10.1787/888933707836>

### ***Tradables are not just manufactured goods and natural resources***

What constitutes a tradable good or service is difficult to delineate. Ranging from goods and services to the industries in which they are produced amplifies the challenge. Innovation in communication, transport and other sectors also changes which goods and services can be traded and the extent to which they can be traded. Data-driven delineations often rely on actual trade volumes to assess whether an industry is “tradable” (De Gregorio, Giovannini and Wolf, 1994<sub>[2]</sub>). Another avenue is the localisation of industries, in particular of services. Non-tradable services are those that are distributed widely across a given territory, while those that are geographically concentrated are considered tradable (Jensen et al., 2005<sub>[3]</sub>). Despite being data-driven, both methodologies retain a degree of arbitrariness as both require the choice of thresholds, either for the degree of trade exposure or the degree of concentration.

As most physical goods can be shipped fairly easily, manufacturing, agricultural production and resource extraction are considered tradable sectors. Conversely, non-tradable services typically include governmental services, education, health care, the construction sector and retail. A growing range of business and technical services is becoming increasingly tradable, but a large percentage remains local. Marketing or public relations agencies have a global reach, lawyers much less so and cleaning services are

clearly a locally provided and non-tradable service. Another challenge arises in when it comes to hotels and restaurants. While tourism is an important contributor to the trade balance in some regions, they provide mainly domestic or even only local services.

Since industry-level data for OECD regions is only available for a maximum of 10 industry groups, the classification of tradable and non-tradable sectors will inadvertently require some compromise. Following the OECD Regional Outlook 2016, tradable sectors are defined as agriculture (A), industry (BCDE), information and communication services (J), financial and insurance activities (K), and other services (RSTU). Non-tradable sectors are composed of construction, distributive trade, repairs, transport, accommodation, food services activities (GHI), real estate activities (L), business services (MN), and public administration (OPQ).

All types of tradable sectors can create productivity growth. It is not “just” the goods manufacturing sector; indeed, resource extraction and tradable services can also be drivers of growth. Increasingly, tradable services are gaining in importance among tradable sectors. In the United States, they account for about half of the value added in tradable sectors (Gervais and Jensen, 2013<sub>[4]</sub>). In Europe, the relative size of tradable service sectors and goods producing sectors is similar across regions (see the section, “Sustaining growth requires sectoral transition”). There is, however, an important difference between manufacturing and tradable services. Manufacturing has traditionally employed not only the highly skilled, but also a large number of medium- and low-skilled workers at relatively high wages, which sets it apart from other high-productivity sectors such as mining or finance (Rodrik, 2016<sub>[5]</sub>).

### *What makes tradable sectors different?*

Tradable sectors are more exposed to international competition than non-tradable sectors. While this might seem obvious, it has a direct impact on the economic mechanisms that affect firms in tradable sectors. For firms, it means that growth and success are not limited to the size of the local market. A company might start out serving the local community, but tradable sectors can extend their reach beyond their local borders. This decouples the growth of tradables, to a certain degree, from the rest of the economy. The flipside of wider reach is that competition is also fiercer. This includes not only actual competition as firms start exporting, but also potential competition as companies from other regions or countries could enter a firm’s local market. For tradable goods and services this limits the flexibility firms have in setting prices.

To remain profitable, firms active in tradable sectors need to be dynamic and innovate, either to align costs of production with the prices that they can reasonably charge for their products, or by creating new products and carving out niches that allow them to gain some pricing power. This process can create significant positive effects for other firms in the area. A study on the impact of the opening of large scale manufacturing plants in counties in the United States between 1980 and the early 1990s finds that the productivity of other existing firms in the county increased by an additional 12% over 5 years compared to productivity in firms in comparable counties where the large manufacturing plant did not locate.<sup>6</sup> Moretti (2010<sub>[6]</sub>) finds substantial job creation multipliers associated with the tradable (manufacturing) sector in the United States. For each job created in manufacturing, the number of local jobs in non-tradable goods and services increases by 1.6. In Sweden, Moretti and Thulin (2013<sub>[7]</sub>) find a smaller multiplier, with estimates ranging from 0.4 to 0.8 jobs.

### *The drivers of productivity growth differ in tradable and non-tradable sectors*

Productivity in a country or a region can increase as the economic sectors become more productive, e.g. because firms invest in new machinery, create new products or implement more efficient processes of creating their goods or services. At the sectoral level, this growth can be driven by incumbent firms or when new, more productive and dynamic firms enter the market and force out older, less productive firms. This source of productivity growth is the “within” component in a three-way decomposition of productivity growth (Box 2.1).

#### **Box 2.1. Breaking down labour productivity growth**

##### **Sectoral and regional contributions to labour productivity growth**

Labour productivity growth can be broken down by sector or region in a multitude of ways including one useful method that divides labour productivity into three components: the productivity growth of the units (within), the reallocation of employment towards the initially more productive units (reallocation level) and the reallocation of employment towards units with faster labour productivity growth (reallocation growth).

With GDP measured at constant prices, labour productivity ( $LP$ ) measured as real GDP per worker in a country ( $i$ ) and year ( $t$ ), i.e.  $\frac{GDP_{it}}{EMP_{it}}$ , can be expressed as the sum of sectoral/regional labour productivity weighted by the employment share ( $ES$ ) of the sector/region with  $j$  indexing sectors/regions.

$$LP_{it} = \sum_{\forall j} LP_{ijt} * ES_{ijt}$$

The growth rate in labour productivity can be separated into two components, one that depends on the change in sectoral/regional labour productivity and a second component that captures the change in employment in more or less productive sectors and regions. The result indicates that both relative shifts in employment across sectors or regions – as well as productivity growth within sectors/regions – contribute to productivity growth. However, the initial formula does not have a straightforward interpretation. Moreover, the combination of beginning- and end-period as “weights” for the changes is not very intuitive either.

$$\begin{aligned} \dot{LP}_{it} &= \frac{LP_{it} - LP_{it-1}}{LP_{it-1}} \\ &= \frac{\sum_{\forall j} (LP_{ijt} - LP_{ijt-1}) * ES_{ijt} + LP_{ijt-1} * (ES_{ijt} - ES_{ijt-1})}{LP_{it-1}} \end{aligned}$$

Different options exist to change the breakdown into a more easily interpretable formula. The drawback of having several options is that there is no unique decomposition of labour productivity growth. The traditional choice is to add and subtract  $\frac{LP_{ijt-1}}{LP_{it-1}} ES_{ijt-1} LP_{ijt}$  to/from the above formula, which yields a formula with three distinct terms.

$$LP_{it} = \sum_j \frac{GDP_{ijt-1}}{GDP_{it-1}} LP_{ijt} + \frac{LP_{ijt-1}}{LP_{it-1}} \Delta ES_{ijt} + LP_{ijt} \frac{LP_{ijt-1}}{LP_{it-1}} \Delta ES_{ijt}$$

The first term captures the direct contribution of sectoral/regional labour productivity growth to total productivity growth. The direct contribution of a sector/region is larger than its initial contribution to the economy (GDP share). The second and third term capture the reallocation of employment towards sectors/regions that were more (or less) productive in the base period (second term) and those where labour productivity grew or declined (third term).

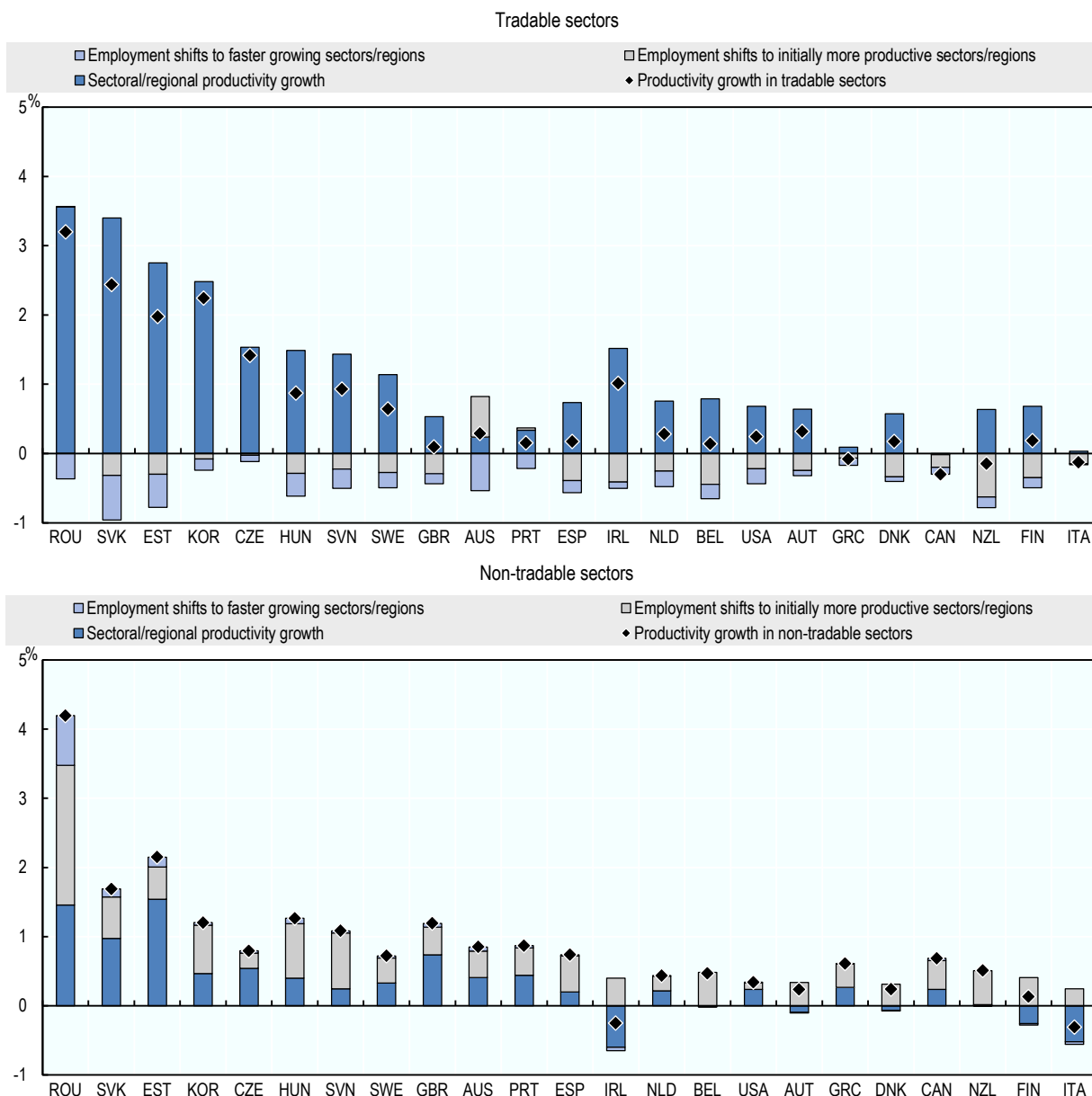
*Source:* Based on de Avillez (2012<sub>[8]</sub>).

Another source of productivity growth is the shift of employment from less to more productive sectors or from less to more productive regions. Here “less” or “more” is relative to the country’s average productivity. Historically, productivity growth is increased by workers transitioning from agricultural production with low productivity to employment in manufacturing with significantly higher productivity. Relatedly, overtime productivity growth is also positively affected if employment shifts from sectors with low productivity growth to sectors with higher productivity growth. The shift of workers in a sector or region can be employment neutral, as workers move from one sector to another, but can also coincide with either employment growth or decline. Over the 2000-13 period, growth in tradable sectors was driven by within-sector productivity growth, i.e. the tradable sector became more productive. In contrast, productivity in non-tradable sectors grew mostly through employment shifts.<sup>7</sup>



**Figure 2.2. Productivity growth in tradable sectors has been driven by improvements within these sectors**

Drivers of labour productivity growth in tradable and non-tradable sectors, 2000-13



*Note:* Countries ordered by total productivity growth (highest to lowest). Labour productivity growth based on per worker GVA within tradable and non-tradable sectors. See Box 2.1 for details on the breakdown. Tradable sectors are defined by a selection of the 10 industries defined in the SNA 2008. They include: agriculture (A), industry (BCDE), information and communication (J), financial and insurance activities (K), and other services (RSTU). Non-tradable sectors are composed of construction, distributive trade, repairs, transport, accommodation, food services activities (GHI), real estate activities (L), business services (MN), and public administration (OPQ).

*Source:* Calculations based on OECD Regional Statistics [Database].

StatLink  <http://dx.doi.org/10.1787/888933707855>

### ***Employment shares shifting to more productive regions contributes to productivity growth in large (capital) city regions***

A further breakdown of the productivity growth shows that the non-tradable transition of employment towards more productive non-tradable activities is mostly due to increased concentration in regions with large cities, typically regions that include the country's capital city. Taking Spain, the United Kingdom and the United States as examples, nearly all of the impact of jobs shifting towards more productive sectors or more productive places comes from a single region, Madrid in Spain, Greater London in the United Kingdom and Texas in the United States (Figure 2.3).

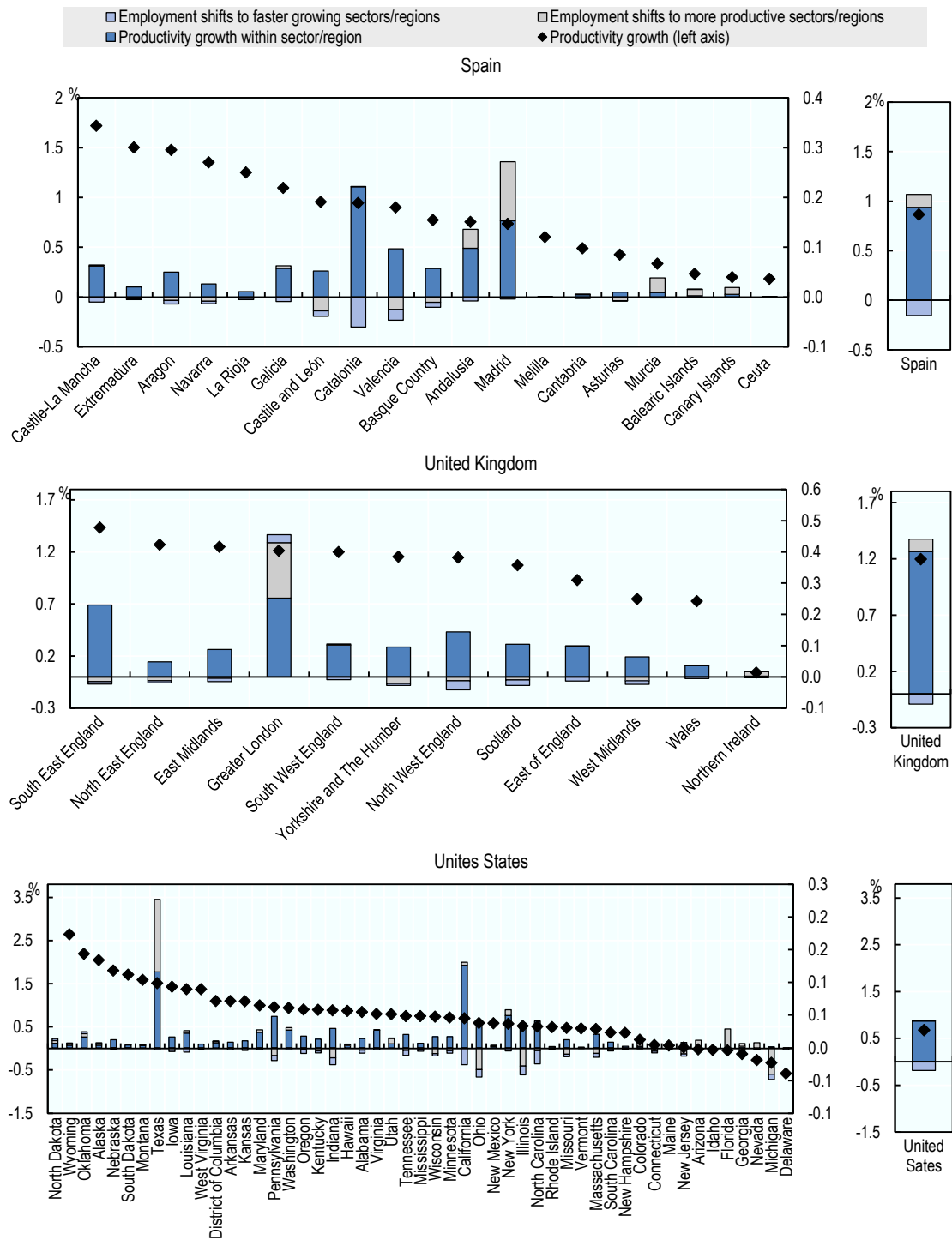
In part this is because these regions are big. They account for a large percentage of total employment and shifts in these large regions will be amplified in the aggregate contribution. But it is not just the size of the regions. Most other regions have not only little but even negative contributions of employment shifts to total growth. One of the reasons why large regions, in particular those with big cities, might create more productive employment opportunities in non-tradable sectors is that they offer the largest markets for services and therefore the greatest opportunities to benefit from economies of scale. They also attract more competitors and thereby create returns on investing in innovative processes and ideas.

While employment shifting towards sectors that are initially more productive contributes a significant percentage in Madrid, Greater London and Texas – between 40% and 50% of the regions' productivity growth contribution – the employment shift's overall contribution to national growth is actually very small (country aggregate in Figure 2.3). Since positive contributions from employment shifts are nearly exclusive to non-tradable sectors, the sectoral transition in non-tradable sectors within regions seems, hence, to contribute very little to overall productivity growth. The same is true for the contribution of shifts of employment towards faster growing non-tradable sectors, as they tend to be negligible.

The two key drivers for overall productivity growth – concentration of jobs in more productive regions and within-sector productivity improvements – have very different implications for inequality. While improving sectoral productivity raises living standards and opportunities everywhere, increased concentration is likely to contribute to further divergence within countries.

Put differently, productivity growth in the tradable sector will have a tendency to contribute to more spatial equality in a country, possibly with the exception of natural resources. In contrast, increases in the non-tradable sector will ultimately contribute to more spatial inequality.

**Figure 2.3. Employment shifting towards more productive sectors and regions is concentrated in a few regions**



Note: The breakdown in national productivity growth equals the sum of the regional contributions. Regions are ordered by total labour productivity growth over the 2000-13 period. See also Figure 2.2.

Source: Calculations based on OECD Regional Statistics [Database]

StatLink <http://dx.doi.org/10.1787/888933707874>

## Sustaining growth requires sectoral transition

The dynamism of tradable sectors is an essential feature of their success. Without constant innovation and progress, firms in tradable sectors risk falling behind competitors or being replaced by new entrants. The introduction of the assembly line by Henry Ford in 1913 and 1914 revolutionised the production of automobiles. Standardisation and separation of tasks increased efficiency and left the more flexible, but less efficient, craftsmen-based production model behind. In the 1950s, the Toyota Motor Company pioneered an adapted version of the mass production system that increased flexibility in the use of key machinery through the standardisation of components and replaced large inventories with “just-in-time” production chains.<sup>8</sup> The result was a rapid expansion in Toyota’s production from less than 50 000 vehicles in 1955 to more than 400 000 in 1965 and 1.1 million in 1970, based on tremendous efficiency gains compared to their competitors.<sup>9</sup>

The innovation on the production side changed the way automobiles were assembled, quality was ensured and inventories were handled. But the product itself changed continuously as well. Today’s cars still run on four wheels and have a steering wheel (at least for now), but little else remains of the 1914 Model T. This progress can change the face of an industry. Until 2003, apprentices in Germany were trained as car mechanics. Since 2003, the changing nature of cars and the car mechanic’s job has been acknowledged and the prior separate tracks of car mechanic and car electrician have been merged into a joint vocational track in car mechatronics.<sup>10</sup>

### *Tradable services are becoming increasingly important*

Despite all progress, car manufacturers still produce “just” cars. But the components that make up a car are dramatically changing. Beyond mechanical engineering, the need for new materials, chemicals and electrical components is matched by an increasing reliance on software to monitor and control the car. This transition means that services that support the production are becoming increasingly important. But the change is not limited to the product itself. Services are becoming increasingly attached to products. Car manufacturers operate their own banks to provide loans or manage leasing, and they run large budgets on marketing, spending more than the total gross domestic product of Slovenia or Lithuania.<sup>11</sup>

Car manufacturing is cited here just as an example, but the pattern is replicated in other industries, e.g. in footwear manufacturing (Box 2.2). The examples combine two important insights into industrial transition. The first is the constant change in the nature of products, new materials, new processes and new ways of using products, which requires industry to adapt constantly. The second is that services, especially those that are tradable, are becoming more prevalent and more prominent in production, opening up new opportunities.

### Box 2.2. Transition towards services in the footwear sector

#### Riviera del Brenta, Italy

In the Riviera del Brenta industrial district in northern Italy, firms in the footwear sector have collaborated to pool investment in training while also collectively upgrading product market strategies in order to engage in high quality international markets. Not far from Venice, the region traditionally hosted cottage industries that mainly employed low-skilled blue collar workers. However, the area has now become a global centre for the production of high quality ladies footwear (supplying Giorgio Armani, Louis Vuitton, Chanel, Prada, Christian Dior among others). This was achieved when the local employers association, known as ACRIB, developed an international brand. High-skilled jobs in design, R&D, management and marketing have increased as a percentage of overall employment in the region. Before the 1993-94 repositioning, almost all workers in shoe manufacturing were blue collar workers; nowadays this proportion is around 40%, with the remaining 60% comprised roughly of 50% designers and 10% sales and marketing staff). Close co-operation with local unions ensured that improvements in productivity led to wage gains and better working conditions, particularly in terms of health and safety.

The economic development of the district has been driven by the privately-run local polytechnic, Politecnico Calzaturiero, which employs managers from surrounding companies to train local workers and job seekers after hours, while also offering management training, and investment in research, innovation and technology transfer. The organisation therefore invests in skills supply while also optimising skills utilisation through new product development and improved human resource management. The fact that firms are members of ACRIB means that they are less concerned about pooling training, technology and new innovations. Indeed, investment in local human capital will not only improve prospects for individual firms but also for the global brand as a whole.

*Source:* OECD (2014<sub>[9]</sub>) based on Froy, Giguère and Meghnagi (2012<sub>[10]</sub>).

#### *Parts of Europe transition towards tradable services*

Across Europe, a sectoral shift is underway in the core EU regions. Services account for more than 80% of the total output produced in 2014, with less than 20% of services were in the tradable sector. But tradable sectors are expanding rapidly with growth of more than 2.5% per year, while non-tradable services grew less than 1.4% per year over the 2000-14 period (Figure 2.4). Although industry, which includes manufacturing, is still larger than tradable services, at least in terms of total output produced, its slow growth means that tradable services are likely to overtake industrial production in the coming years.

#### *Growth in low-income regions is led by industrial production*

Tradable services do not play the same key role in all parts of Europe. In Europe's least-developed ("low-income") regions (i.e. those with less than 50% of the EU average per capita GDP) industrial production accounts for one-third of total output. In these

regions, located in Bulgaria, Hungary, Poland and Romania, industry is also the fastest growing sector. Non-tradable services in these regions account for smaller shares of the regional economies than in other parts of Europe, but these sectors are growing at nearly the same pace as the industrial sector. But when it comes to tradable services, “low-income regions” are at the very early stages of development. Tradable services account for less than 6% of their economies and only grew at a rate of about 1.2% per year over the 2000-14 period (Figure 2.4). While that might be a relatively high growth rate in the overall EU context, among low-income regions the expansion of tradable services was slow, and even slower than growth in agriculture (1.5%).

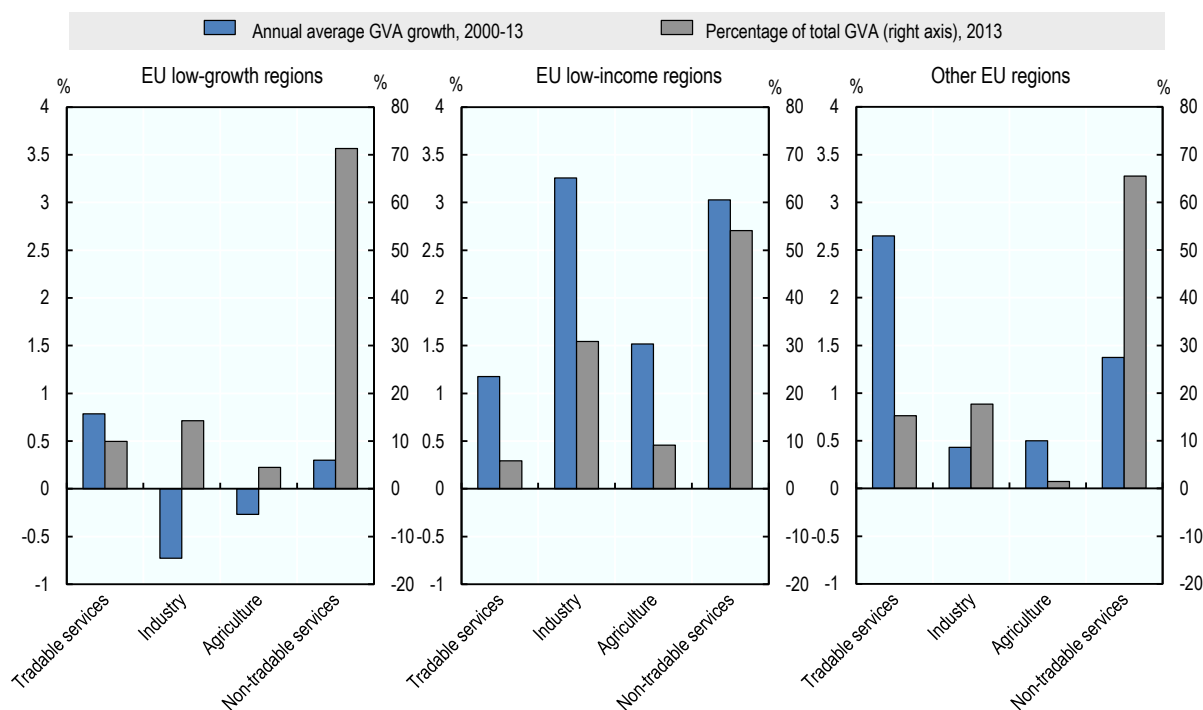
### ***Low-growth regions are struggling to diversify into tradable services***

The picture is very different for struggling regions in Europe’s south. Industrial production accounts for less than 14% of total output in these “low-growth” regions, which were lagging behind the EU average in terms of per capita GDP in the 2000s and grew below the EU average between 2000 and 2013.<sup>12</sup> In addition to already being a small sector, industry declined by 0.7% per year between 2000 and 2013 (Figure 2.4).

What is missing in “low-growth” regions is a transition towards new tradable opportunities. Non-tradable services account for more than 70% of total economic activity, with tradable services contributing less than 10% – one-third less than in other parts of Europe. In addition, tradable services only expanded by 0.8% per year, more than other sectors in low-growth regions, but below the growth rates of tradable services in other parts of Europe.

In addition to a lack of transition towards tradable services, the goods-producing sector appears to be stagnating. Manufacturing remains an important contributor to regional economies in many regions. Production of goods, however, is now more than the manufacturing and assembly of parts. In an increasingly globalised world, the main source of value added is often found in up- or downstream steps in the production process. Research and development (R&D) and design of new products, as well as marketing and aftersales services often carry higher value added than the assembly of the product itself.<sup>13</sup>

**Figure 2.4. Low-growth regions in Europe struggle to transition towards high-growth sectors**



*Note:* GVA level and growth (2000-13) in 2010 USD at constant prices and PPPs. Data for 17 EU countries. Low-income regions are EU regions with less than 50% of EU-average per capita GDP in 2000; low-growth regions are EU regions with less than 90% of the EU-average per capita GDP in 2000 (less-developed and transition regions) that grew less than the EU average over the 2000-13 period (full list in Annex Table 1.A.1) Tradable services include information and communication (J), financial and insurance activities (K), and other services (RSTU). Non-tradable services are composed of construction, distributive trade, repairs, transport, accommodation, food services activities (GHI), real estate activities (L), business services (MN), and public administration (OPQ).

*Source:* Calculations based on OECD Regional Statistics [Database].

StatLink  <http://dx.doi.org/10.1787/888933707893>

### Successful sectoral transitions require skills, ideas and stamina

Sectoral transition is a difficult task. The legacy of the decline in mining in England's north or Germany's Ruhr area is still evident today. Cities like Gelsenkirchen or Duisburg in Germany's Ruhr area, which were once thriving economic centres in coal mining and steel production, struggle with unemployment rates that are more than twice the country average even decades after the major decline in Germany's extractive industries.<sup>14</sup> The closure of heavy industries in the "Rust Belt" in the United States did not result in such a spike in unemployment rates, but instead led to large net migration flows and thereby an erosion of the local economic base.<sup>15</sup>

Technological progress has always changed the nature of jobs and rendered some obsolete. The move from artisanal to factory production in textiles reduced the need for shop-floor workers, but created new jobs for engineers and technicians, as well as demand for supervisory workers, bookkeepers and other administrative staff. Therefore the disruptions caused by major technological shifts have been temporary, at least in

aggregate. But “temporary” does not mean short-lived nor are the disruptions evenly distributed across workers or regions in a country.<sup>16</sup>

### *Loss of job-specific skills can make transitions costly for workers*

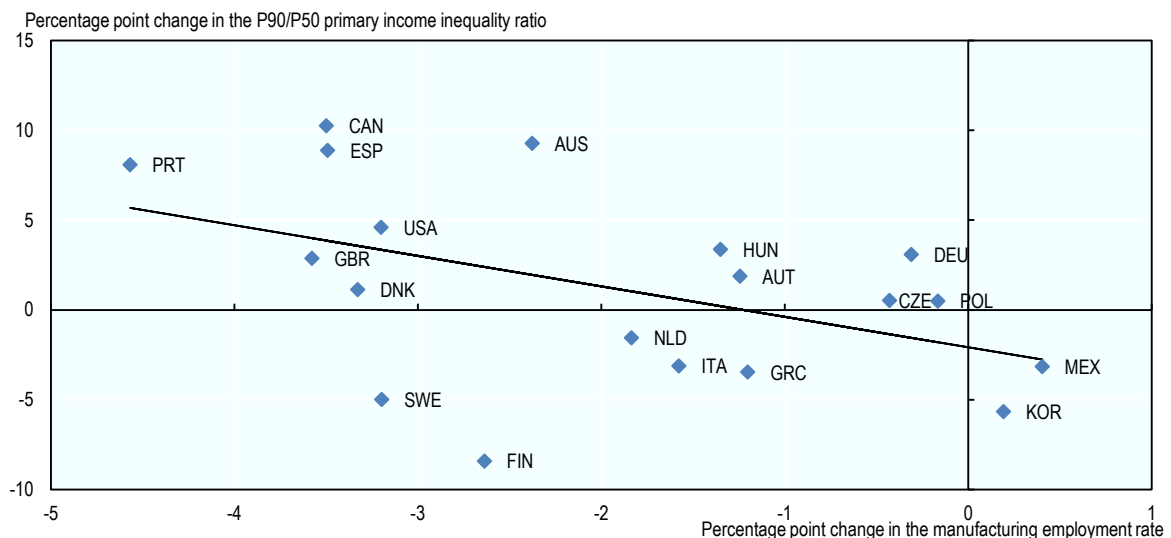
For displaced workers, finding new jobs, especially those with equivalent income is difficult. As the nature of jobs changes, the knowledge and skills specific to their jobs and tasks that they have built up over time becomes obsolete. In economic terms, this means that their “human capital”, i.e. the sum of their knowledge and personal attributes that allow them to create economic value, depreciates.

A manufacturing worker with 20 years of experience in metalworking, using heavy welding and cutting equipment, cannot easily transition into service jobs. Some of the habits might be useful in other jobs, e.g. as a truck driver, given that supporting the loading and unloading of materials might come natural to someone used to working in teams on physically demanding tasks. However, transitioning into a chemical technician working in a laboratory, a cargo and freight agent in logistics or a manager in retail is difficult and usually impossible. But these are the service jobs that pay a similar average salary as those of a metal worker.<sup>17</sup> Jobs that are more easily accessible, e.g. janitor, bartender or taxi driver, pay much less than manufacturing jobs.

Across OECD countries, a decline in manufacturing employment in a region is associated with a decline in total employment (Figure 2.5). This might be due to lower re-employment prospects of displaced manufacturing workers, but could also be due to the positive multipliers of employment in tradable sectors. As expanding tradable sectors create demand for jobs in local services, so could a decline in tradable sectors, here in manufacturing, lead to further contraction.

**Figure 2.5. Income inequality across regions rose more in countries with larger losses in manufacturing employment**

Percentage point change in the ratio of 90<sup>th</sup> and 50<sup>th</sup> percentile primary income, 2000-14



*Note:* The change in primary income inequality is measured as the change in the ratio of the TL2 region with average primary income at the 90th percentile to the TL2 region with average income at the 50th percentile average income. Data for 2000-14 or closest years available.

*Source:* OECD (2017<sub>[11]</sub>) based on OECD Regional Statistics [Database].

StatLink  <http://dx.doi.org/10.1787/888933707912>



### *Gains from industrial transition are not evenly distributed*

Since at least the 1990s, jobs in OECD countries have increasingly polarised with gains in “lousy and lovely jobs” (Goos and Manning, 2007<sub>[12]</sub>). Employment increased in both occupations paying high wages and in those paying low wages.<sup>18</sup> The polarisation of jobs has been linked to the degree of routinisation of tasks required for the job. The more standardised a task, the more easily it is replaced. This is the case for both cognitive and manual routine tasks. Some administrative jobs, such as record keeping, or those including repetitive services, e.g. bank tellers, are examples of jobs with a high degree of routine tasks that can be relatively easily replaced through computerisation. Industrial robots can replace routine manual tasks, such as sorting or repetitive assembly. Conversely, creative writing or cleaning services are harder to replace as they are highly non-routine.<sup>19</sup> There is also evidence from the United States that suggests that social skills and tasks that focus on interaction play an important role in driving relative employment growth (Deming, 2017<sub>[13]</sub>).

Industrial change and technological progress does not destroy all jobs, but those that remain often change significantly. A factory worker producing machine parts might have manually filed, welded and assembled pieces in the past, tasks that were then increasingly supported by specialised tools, which finally become ICT supported. This means that production moved from using predominantly blue collar workers in manual roles to using robots and engineers that monitor and program these tools. Occupational changes in the United States since the 1980s seem mainly driven by these within-industry shifts, whereas prior to the 1980s the driving force behind the changing structure in jobs was the shift between different types of industry (Acemoglu and Autor, 2011<sub>[14]</sub>).

The gains from new opportunities have mainly accrued to those with higher levels of education and, more generally, those individuals who are more “skilled”. This “skill-biased technological change” has been linked to rising income inequality. Despite a growing supply in highly educated workers, wages relative to those of workers without a university degree have increased steadily since the 1980s. This implies that demand rose even faster than supply.<sup>20</sup> Both the growing integration of information and communication technologies (ICT) and the attendant increase in the value of non-routine tasks in production, as well as incentives to focus on skill- and knowledge-intensive sectors and parts of value chains have been linked to skill-biased technological change.<sup>21</sup> Importantly, it appears to be the combination of computerisation and the increase in non-routine tasks – rather than computerisation on its own – that is driving demand for skilled workers.<sup>22</sup> The concept of “skills” in this context refers to workers that are more adept at a variety of (non-routine) tasks. Non-routine tasks and offshoring both play a role in explaining growing polarisation as both lower the demand for middle-wage jobs. However, evidence from 16 Western European countries suggest that it has been the change in the nature of tasks rather than offshoring that has driven polarisation (Goos, Manning and Salomons, 2014<sub>[15]</sub>).

High levels of education and skill benefit the individual who possesses them, but such qualities can also create positive spillover effects on other workers. An advanced degree can create significant personal benefits for workers. Personal incomes rise with the level of education, but also other aspects improve, e.g. health outcomes.<sup>23</sup> But working in an environment where the educational attainment of others is higher can also raise the productivity and wages of workers without increased education. The presence of such

social (as opposed to private) returns to education often justifies subsidising education and training.

### *Structural change is more challenging for low-density economies*

The impact of industrial transition in the local labour market is particularly severe when the local economy is not diversified. The more heavily an area depends on specific sectors, the larger the potential shock to its economic structure. Diversification is particularly problematic for low-density – rural – economies where labour markets are too “thin” to allow for a large variety of firms to be established. These places need to specialise to achieve critical mass and economies of scale (OECD, 2016<sub>[16]</sub>). But the need to specialise implies that when the local industry is adversely affected by competition or declining demand, a mass of newly unemployed workers swells the supply of labour while demand shrinks. In larger markets, e.g. large cities, the increased number of job seekers can be absorbed by other sectors more easily.

In some cases the transition is created by a sudden shock. This was the case when the People’s Republic of China (“China” hereafter) joined the World Trade Organisation (WTO) and competition increased for some manufacturing companies around the world. Particularly hard hit were certain companies manufacturing ICT equipment and textiles, China’s first and second largest group of exports in 2001, the year when the country joined the WTO.<sup>24</sup> More generally, labour-intensive manufacturing was facing strong competition from China.<sup>25</sup> A study for the United States estimates that local labour markets that were more exposed to the growth in imports from China experienced, on average, a 4.5% fall in manufacturing employment and a decline in the employment rate by 0.8 percentage points, relative to a local labour market that was less exposed.<sup>26</sup> In other cases, the change has been gradual. For instance, in Italy’s north, the Province of Bergamo is gradually shifting away from traditional medium- and low-tech activities towards medium-high tech activities with higher productivity and value-added potential (OECD, 2016<sub>[17]</sub>).

### *Buffering shocks requires supply and demand side measures*

The central challenge in adapting to industrial transition is that obsolete skills need to be replaced. At the regional level the next generation of workers might provide those skills. An inflow of workers from other places, both within the same country but even from other countries, can provide firms in regions with the capacity to utilise opportunities arising from industrial and technological change. But displaced workers might find it more difficult to adapt. The personal cost they incur can be quite significant with the less-educated often more affected than others. They are less mobile and therefore less able to find alternative opportunities in other regions. In addition, their skills are often more specific to the tasks they used to perform, and therefore no longer in demand.<sup>27</sup>

This challenge is amplified by the increasing digitisation of jobs and an increasing pace of industrial transition. Workers need to combine specific skills to be competitive in their industries, with general skills that allow them to adapt to upcoming challenges. Successful moves towards high-value added activities require general skills, tacit, non-codified knowledge in areas such as original design, the creation and management of cutting-edge technology and complex systems, as well as management or organisational know-how (OECD, WTO and World Bank Group, 2014<sub>[18]</sub>). Regions with traditional strengths in manufacturing used to make school-to-work transitions relatively easy. As a result, young people often joined the labour market as soon as they had completed

compulsory schooling, without finishing secondary education or obtaining a post-secondary degree. They found work and acquired job-specific skills in the workplace. The result is a large percentage of employees who are highly skilled in job- or firm-specific tasks but who lack the general skills required to adapt to modern production techniques and to implement innovative practices.

Adapting to sectoral transition therefore requires measures that target the next generation of workers, as well as those individuals who already work. Lifelong learning is not a new concept, but it requires further differentiation. Training to prepare for sectoral transition is not just specific to the task at hand, but has a general component that can be useful in other occupations or help upgrade the workers' profile. When it comes to computerisation and digitisation this remains an uphill battle. On average, over 40% of those using software at work every day do not have the skills required to use digital technologies effectively (OECD, 2016<sub>[19]</sub>). But the changing nature of jobs makes digital skills increasingly important. A recent study estimates that 9% of jobs in OECD countries are at high risk of being automated (Arntz, Gregory and Zierahn, 2016<sub>[20]</sub>).

Supply-side measures focused on workers need to be coherent with demand-side developments if they are expected to succeed, in particular in low-density economies. Retraining and new skills are only valuable if there are employment opportunities in which they can be used. In areas with large and dynamic labour markets and high rates of new firm creations these opportunities might arise naturally. In other areas there might be room for targeted policy interventions that create incentives for investment and the creation of new firms.

### Is a large tradable sector more risky for a region?

The exposure of tradable sectors to international fluctuations in demand and to global shocks might make them seem less resilient than non-tradable sectors that depend on the local economy. This raises the question of whether a strong focus on tradable sectors is creating risks that could be avoided by instead focusing on sectors that only serve their local economy. The 2007-08 crisis can provide some insights into the resilience of tradable sectors.

#### *Many regions experienced employment decline after the 2007-08 crisis*

Employment declined in many regions following the 2007-08 crisis, with unemployment rates surging and remaining high for years after the initial shock. In the Norte region in Portugal, for example, 150 000 fewer people were employed in 2015 than in 2008, a nearly 9% drop in employment. Low productivity growth in non-tradable sectors is likely to contribute to the pattern. In Norte, manufacturing firms increased labour productivity at the cost of declining employment, whereas tradable services grew both in terms of productivity and employment (Figure 2.6). New jobs were mainly created in non-tradable services, but these jobs were less productive than the existing ones, which led to a decline in average labour productivity in the sectors. With the shock of the 2007-08 crisis, these jobs were not sustained and non-tradable services reduced employment by 77 000 jobs, more than were created before the crisis. Manufacturing, instead, underwent continuous restructuring as productivity increased; although many jobs were lost – more than 150 000 over the 2000-15 period. Norte is not alone in this experience. Central Macedonia in Greece had 170 000 fewer people employed, nearly 22% less than in 2008, and more than half a million fewer people worked in Andalusia (Spain) in 2014 than in 2008, a drop of 17%.

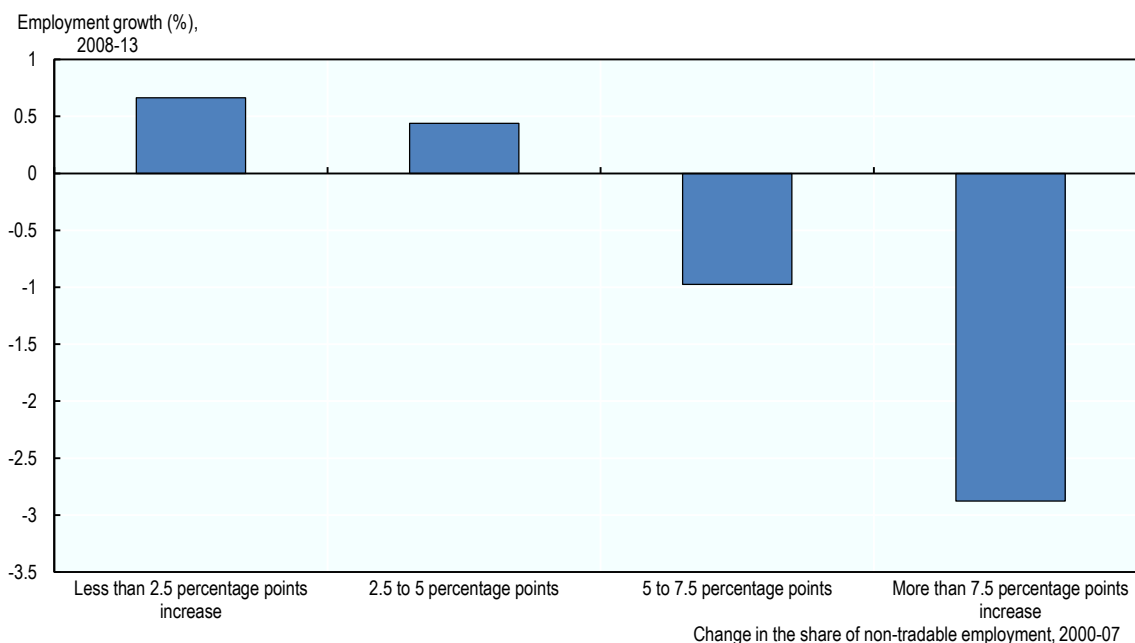
### ***Regions with the largest non-tradable sector expansions suffered the strongest employment losses***

Employment post-2008 declined (more) in regions that expanded their non-tradable sectors relative to tradable activities in the pre-crisis period (2000-07). Employment in regions where non-tradable employment increased by less than 2.5 percentage points between 2000 and 2007 grew, on average, by nearly 0.7% per year between 2008 and 2014. Employment growth was, on average, about 0.4% in regions with moderate increases in non-tradable employment and negative for regions with large expansions of non-tradable employment. Since the crisis, employment has declined, on average, by nearly 1% for regions where employment shifted by 5-7.5 percentage points from tradable to non-tradable sectors and by 2.9% for regions with more than 7.5 percentage point shifts (Figure 2.6).

This might seem surprising, but non-tradable activities are not truly insulated from global trends. Local links tie tradable and non-tradable sectors together. Demand factors play a role as well. As global economic conditions suffer, non-tradable sectors have to rely on local demand to pick up again, while firms in tradable sectors have the opportunity to develop new and alternative markets (or even start trading if they had not done so before).

**Figure 2.6. Regions with strong pre-crisis increases in non-tradable sectors lost more jobs**

Annual average employment growth (2008-13) and change in the share of non-tradable workers in total employment in 2007 compared to 2000

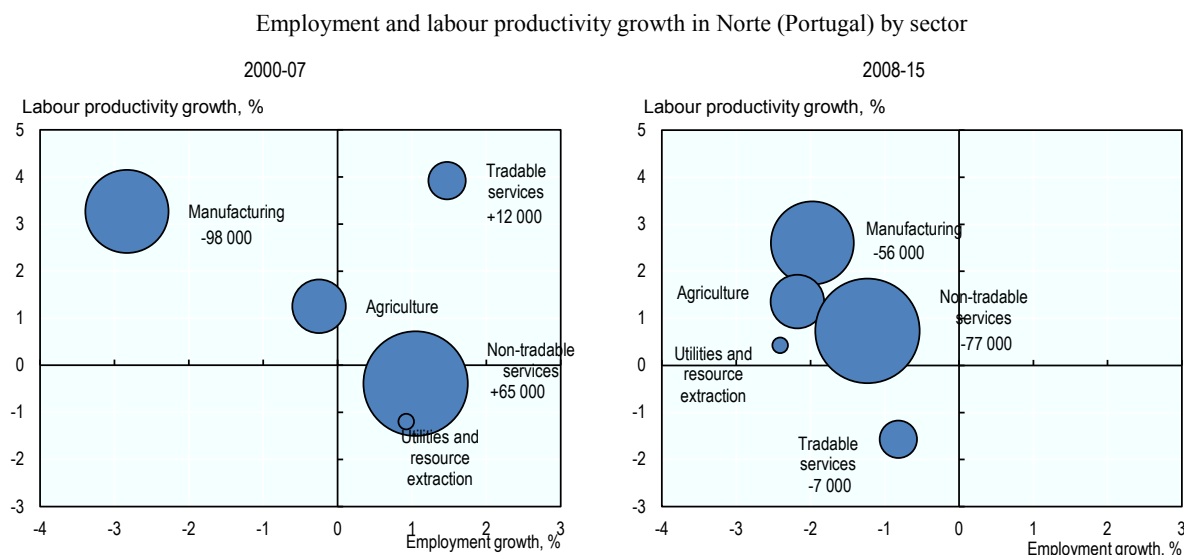


*Note:* Data for 203 territorial level 2 (TL2) regions in 19 OECD countries: Austria, Australia, Belgium, Bulgaria, Czech Republic, Denmark, Finland, Greece, Ireland, Italy, the Netherlands, Portugal, Romania, Slovenia, Slovak Republic, Spain, Sweden, the United Kingdom and the United States. Categories from left to right include 81, 84, 19 and 19 regions.

*Source:* Calculations based on OECD Regional Statistics [Database].

StatLink  <http://dx.doi.org/10.1787/888933707931>

**Figure 2.7. New non-tradable jobs were less productive and quickly lost after the 2007-08 crisis in Norte, Portugal**



*Note:* Labour productivity is real gross value added in USD in constant 2010 prices and PPPs per worker. Numbers indicate employment change over the period, bubble size indicates the size of the sector in terms of employment in 2000. Tradable services are taken as information and communication (J), financial and insurance activities (K), and other services (RSTU). Non-tradable services are composed of construction, distributive trade, repairs, transport, accommodation, food services activities (GHI), real estate activities (L), business services (MN), and public administration (OPQ). Real estate activities are excluded in this chart.

*Source:* Calculations based on OECD Regional Statistics [Database].

StatLink  <http://dx.doi.org/10.1787/888933707950>

### *Economic imbalances accrued before the 2007-08 crisis*

During the 2007-08 crisis the expansion of non-tradable sectors led to significant adjustments of imbalances that accrued in the pre-crisis period. Economies that focused on non-tradable sectors were quick to rise and equally quick to fall in the wake of the 2007-08 crisis. An important reason is that countries sustained consumption through mounting current account deficits and increasing debt. As countries import more than they export they build up liabilities towards their export partners. With flexible exchange rates, current account imbalances can be addressed by allowing the currency to devalue, thereby increasing the cost of imports and lowering the cost of exports. But the fixed exchange rate regime among euro area members means that external imbalances need to be addressed through other channels. Construction- and consumption-fuelled growth turned out to be unsustainable.

Imbalances within countries can be sustained, but require constant transfers. Public agencies, for example, that are located in regions whose economies are lagging behind the country average can be financed through central funds. With implicit or even explicit transfers, regions can support a strong non-tradable sector. But this strategy comes at a price. It typically requires increasing transfers from other regions to support the regions that are lagging behind, as wages tend to rise relative to productivity in non-tradable sectors (see Chapter 4. ).

Moreover, it tends to lock regions in as it lowers the momentum for local growth and the creation of new sectors. Fledgling firms in the tradable sector have to compete with the opportunities offered by the subsidised sectors. In addition to the challenges of setting up and running a new firm, they have to offer wages that attract talent and secure financing at premium rates to compensate investors for foregoing less risky investments in subsidised sectors or in other parts of the country.

### Well-functioning cities are supporting successful catching up

The discussion to this point focused on tradable sectors as a catalyst for catching up. The OECD Regional Outlook 2016 highlights a second source of successful convergence: well-functioning and integrated cities (OECD, 2016<sub>[16]</sub>). Proximity to large cities can support growth and catching up. Divergence in productivity is, however, not necessarily driven by distance from those cities. Different channels create the productivity benefits of cities. In part, they are due to the difference in the sectoral structure, in part due to differences in the characteristics of the workforce, but they are also the result of productivity benefits found in larger and denser cities – so called “agglomeration benefits” (OECD, 2015<sub>[21]</sub>).

### Cities play an important role for growth within and outside their region

Workers in larger cities are more productive than those in smaller cities or in rural areas. The gap arises, in part, due to differences in the characteristics of the local workforce. Workers in larger cities are, on average, more educated and have skills that would make them more productive no matter where they live or work (OECD, 2015<sub>[21]</sub>). But other factors, such as sectoral composition, play an important role as well. This benefits the city, but also the region where it is located.

For rural areas, stronger linkages between urban and rural places are increasingly emphasised as possible drivers for differences in growth performance. Flows between rural and urban areas are facilitated when the two are in close proximity (OECD, 2013<sub>[22]</sub>). Rural amenities, such as green space, are easy to reach, while rural residents can make use of specialised public and private services that are often only found in cities. In remote and rural places, by contrast, there are fewer direct connections with cities, and local residents and firms must rely almost exclusively on local providers of goods and services.

#### *Characteristics of the workforce, firms and “agglomeration benefits” make larger cities more productive*

Among the most productive “frontier” regions, 80% are “predominantly urban”, i.e. more than 80% of their population lives in densely populated areas.<sup>28</sup> The higher productivity in cities is linked to their size. For OECD metropolitan areas with at least 500 000 inhabitants, every 10% increase in population is associated with 1% higher productivity in terms of gross domestic product (GDP) per worker. Going back to the example of Paris, this implies that the output per worker in the metro area of the French capital – with its 12 million inhabitants – is expected to be more than 18% higher than in the second largest metro area Lyon with close to 2 million inhabitants.<sup>29</sup>

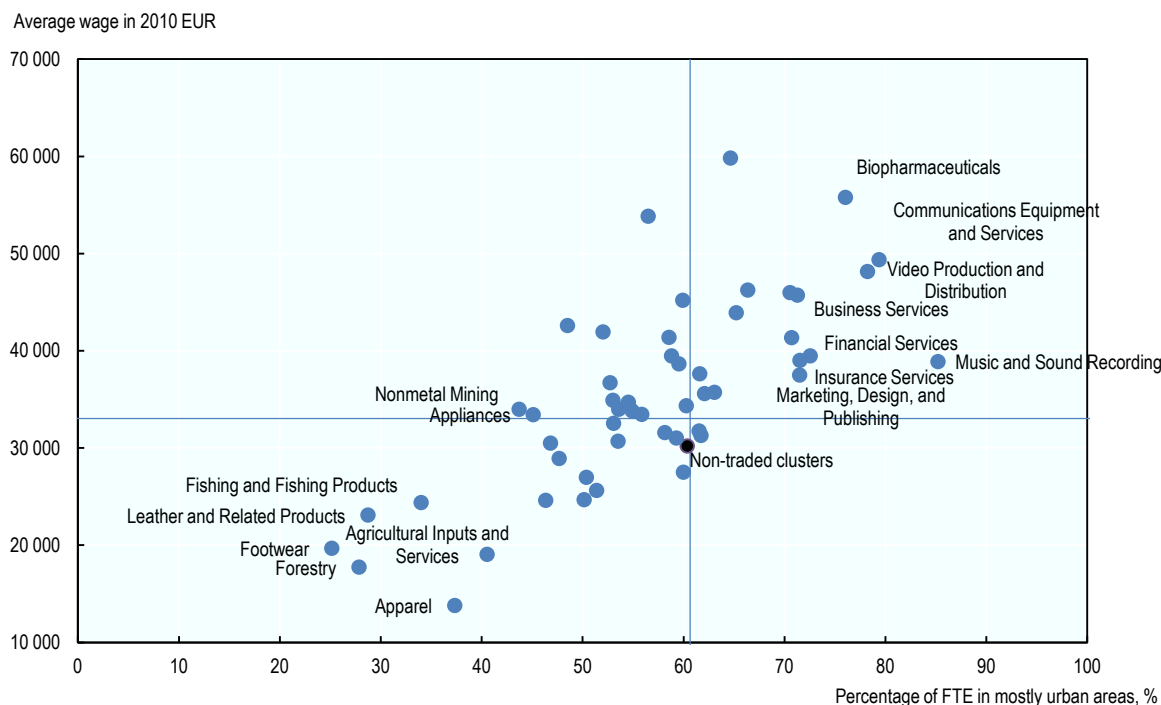
About half of the success of (larger) cities comes from their ability to attract highly educated and highly skilled workers. These workers would be more productive in any place that they work, but they choose to work in larger cities. The other half of the effect

comes through “agglomeration economies”, economic benefits that arise from working in larger and denser places. Taking the characteristics of workers into account, the productivity benefits provided by the city in which they live are estimated between 0.2% and 0.5% for each 10% increase in city size.<sup>30</sup> This means that the same person working in Madrid with its more than 6 million inhabitants is nearly 15% more productive than he or she would have been working in Toledo with its 120 000 inhabitants.<sup>31</sup>

***Cities attract more tradable services, while resource extraction and mature industries are more prevalent in rural regions***

Most non-tradable services need to be provided locally and are therefore present in all types of regions. Manufacturing or tradable services, on the other hand, tend to be concentrated in one area. In manufacturing, this concentration arises as suppliers and producers locate close to each other or companies working on similar products or with similar technologies work in the same place. But the variety of needs and niches in manufacturing results in a relatively wide distribution of industrial jobs. Modern tradable services are, however, significantly more concentrated than manufacturing or local services.

Large metropolitan areas, like London, New York or Tokyo, are home to some of the most productive and innovative firms. They are mainly focused on services, often business services, but also health care, higher education and information and communications technologies (OECD, 2014<sub>[23]</sub>). Manufacturing firms located in large cities are typically focused on innovation and skill intensive production and often only parts of the company (e.g. the headquarters) remain in the city. Unsurprisingly, wages paid by firms in tradable clusters that are more likely to be located in urban areas are, on average, higher than in clusters in less-densely populated areas. However, the average can hide some significant outliers, especially among resource-rich rural regions. In many OECD countries, resource-rich regions are among the most productive regions, if not the most productive themselves, as they are drawing on “resource rents”.<sup>32</sup> The benefits from most resource extraction activities are, however, temporary as extraction depletes the local reserves, which is typically not captured in national accounts and therefore productivity calculations.

**Figure 2.8. Traded clusters in cities are higher paying**

*Note:* Full-time equivalent employment (FTE) and average wages in firms operating in traded clusters in NUTS 2 regions. Percentage of FTE in mostly urban areas is defined as the total FTE in the traded cluster in NUTS 2 regions with at least 70% of their population living in an FUA (or some percentage of their population living in a large metropolitan area with more than 1.5 million inhabitants) as a percentage of total FTE in the traded cluster.

*Source:* Calculations based on Ketels and Protsiv (2016<sub>[24]</sub>) with data provided by the authors and OECD Regional Statistics [Database].

*StatLink*  <http://dx.doi.org/10.1787/888933707969>

### *Economies in rural areas*

Rural economies are often heavily reliant on agricultural production or natural resource exploitation (OECD, 2016<sub>[1]</sub>). Manufacturing in these areas tends to be in “mature” parts of the product cycle using established technologies and processes. The small size of the labour market in rural, i.e. low-density, areas also leads to less diversification than can be achieved in large cities. The reality of rural areas is, however, quite diverse and most regions mix rural and urban elements in their economies.

Links between rural and urban regions can be a key asset to overcome disadvantages associated with low-density economies. The OECD Regional Outlook 2016 (2016<sub>[1]</sub>) finds that rural areas close to cities have been more dynamic and resilient since the 2007-08 crisis as compared to rural remote regions and even predominantly urban regions.<sup>33</sup>



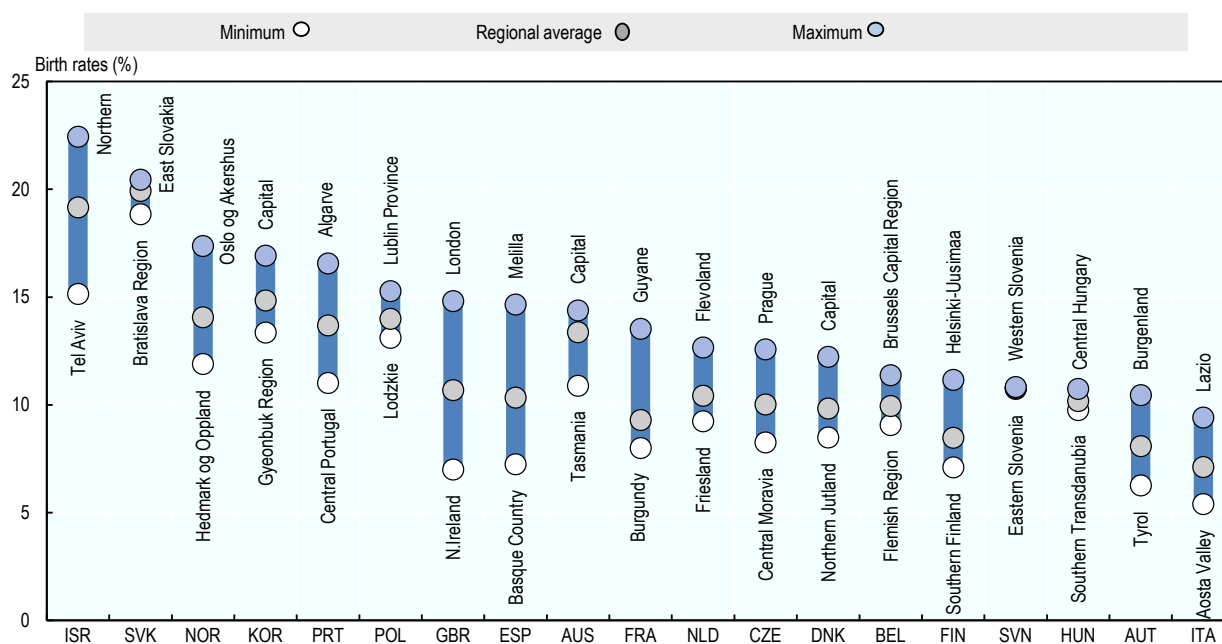
## Business creation is most dynamic in the largest or capital cities

### *Predominantly urban regions have higher firm entry, but also higher firm exit rates than predominantly rural regions*

Business creations differ across OECD countries between urban and rural areas. Average business creation rates are 13% (of the total number of existing firms) in predominantly urban regions, but 10.9% in predominantly rural ones. For the remote rural regions, those not in the vicinity of an urban agglomeration with at least 50 000 inhabitants, the percentage of business births is 9.3%, i.e. even lower than in other rural regions.

This distinction is particularly relevant for the sectoral composition of new firms, as urban regions attract relatively more knowledge-intensive firms. More than 60% of firms created in knowledge-intensive sectors take place in predominantly urban regions. In comparison, predominantly urban regions account for 52% of all new firms and 50% of existing firms (OECD, 2017<sub>[25]</sub>). These higher rates in predominantly urban regions do not necessarily translate into higher firm survival rates, measured by survival for at least three years after creation. Instead, the higher churn might indicate a stronger tendency towards creative destruction as more innovative businesses more rapidly replace old businesses.<sup>34</sup>

**Figure 2.9. The most dynamic business environment is typically the capital city region**



*Note:* The figure refers to the total number of new businesses being created as a proportion of total active firms in the region (TL2) in the year 2014 (or last available). All firms are included (total across sectors and size classes).

*Source:* Calculations based on data collected in OECD (2017<sub>[25]</sub>).

StatLink  <http://dx.doi.org/10.1787/888933707988>

### *Smaller firms, slower growth and less entrepreneurship limit Europe's lagging regions*

Europe's low-growth and low-income regions tend to have more small firms and often lack larger ones. They also tend to see fewer new firms created and when new firms enter the market their average size tends to be smaller than in other parts of the country (European Commission, 2017<sub>[26]</sub>).<sup>35</sup> Small size and low churn can limit the flow of innovation and be a sign of a lack of efficient reallocation of capital and workers towards more productive activity.

Firm size in itself does not imply success, but in many instances it is associated with it. Agricultural labour productivity in Poland is higher in regions with more large farms and lower in regions dominated by small farms.<sup>36</sup> In some countries, firm size can explain a significant part of the gap between national champions and global champions in terms of productivity. For example, one estimate suggests that two-thirds of the productivity gap between Italy's most productive manufacturing firms and those operating at the global frontier is due to Italy's most productive manufacturers being relatively small compared to those at the frontier (Andrews, Criscuolo and Gal, 2015<sub>[27]</sub>).

### **The positive impact of a city is not constrained by its geographical limits**

Large cities can support growth and catching-up momentum in smaller cities and rural areas. Firm growth in rural areas tends to be driven by urban demand for resources, goods and amenities (OECD, 2016<sub>[16]</sub>). The small local market means that firms have to focus outward, providing goods and services to nearby cities or even abroad. But beyond the value as a market, nearby cities can be service hubs for rural areas, consolidating functions that lack sufficient market size in smaller places. This is the case, for example, when several weak local newspapers merge to create a single regional paper that has more viability.

For rural areas in close proximity to cities these benefits can arise through daily commuting and economic flows. Metropolitan areas extend well beyond their core city and include significant parts of the surrounding, rural "hinterland", which is linked by daily commuting flows. These rural areas can both benefit from and support the growth of their core cities.

Smaller cities and rural villages outside of the direct commuting zone might not have the capacity to create strong agglomeration economies in their own right, but through links with other cities they can "borrow" agglomeration benefits.<sup>37</sup> Short drives or train trips that connect rural areas to large cities allow firms, located in rural areas, to tap into specialised services available only in cities.

In Germany, the town of Montabaur was connected via high-speed rail in the early 2000s. At the time, the town had less than 15 000 inhabitants. After the train line was opened in 2002, Montabaur could be reached from Frankfurt and Cologne within 40 minutes of travel and the international airports of the two cities could be accessed within 20 minutes. Since then, the industrial park located next to the train station has attracted more than 50 firms. Estimates for Montabaur and two further counties that became connected suggest that between 2002 and 2006 the new connection led to an increase of about 8.5% in GDP and an increase in labour productivity of about 3.8%. Productivity increased through the creation of new firms and jobs, rather than improvements in productivity in those firms already located in the area (Ahlfeldt and Feddersen, 2015<sub>[28]</sub>).

However, for agglomeration benefits in metro areas and “borrowed” agglomeration benefits to fully materialise, governance problems need to be addressed such as a lack of local co-ordination in transport or land-use planning, low levels of institutional capacity, and the lack of an integrated metropolitan strategy. Without a well-functioning governance framework, the potential benefits of metropolitan areas is underutilised and “catching up” limited (OECD, 2012<sub>[29]</sub>).

### ***Borrowed agglomeration benefits raise productivity close to large cities***

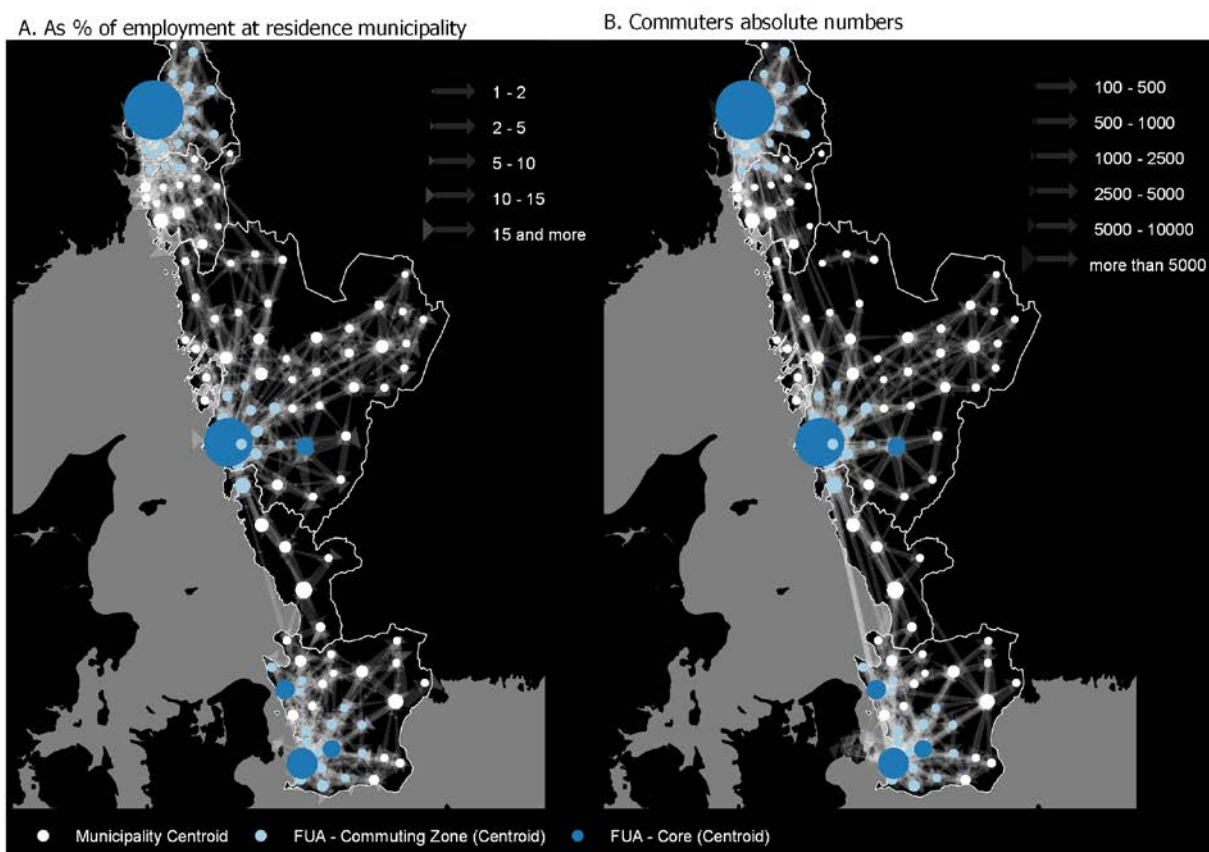
Urban centres play an important role not only through their contribution but also as markets, links and service centres for rural areas. They can create positive effects, as larger cities provide specialised services and serve as hubs for trade and transport. By providing these services, they are essential for well-functioning rural parts of the economy. As proximity to cities facilitates businesses’ and rural residents’ access to these functions, it also makes it easier to “borrow” agglomeration economies from the city. This effect can be substantial. Estimates of agglomeration benefits for the Netherlands show little gain from larger size. But a closer look shows that the lack of an average effect is driven by small cities that border the country’s large, highly-productive metropolitan areas (OECD, 2016<sub>[30]</sub>).

Along the western Scandinavia coast, the regions around Oslo, Gothenburg and Malmö are highly integrated. Jobs and homes are spread across the whole region with more than 10% of the local workforce routinely commuting from the less-densely populated parts of the region into the city, and vice-versa (Figure 2.10). There are potential drawbacks from being located close to a large metro area as well. Concentration of activity in metropolitan centres might cast an “agglomeration shadow” on smaller cities and surrounding areas as the core benefits from productivity and population growth focus on cities at the expense of surrounding areas (Fujita, Krugman and Venables, 1999<sub>[31]</sub>). The migration flows and increasing population concentration in large cities documented in Chapter 1 are indicative of such shadows for population flows; but for productivity, the ability to borrow agglomeration benefits seems to prevail.

The benefits of cities for their surrounding regions are linked to the ease with which they can be accessed. Regions closer to cities, and especially those in proximity to larger cities, have grown faster in terms of per capita GDP than regions that are more remote (Figure 2.11). The positive spillovers decline with distance, but are measurable up to 200-300 kilometres away. The actual travel time from a region to the nearest metropolitan area is the key factor that needs to be considered. Cutting travel time by half is associated with an increase of 0.2-0.4 percentage points in annual per capita GDP growth.<sup>38</sup>

**Figure 2.10. Strong rural-urban linkages within Western Scandinavia**

Commuting flows in Western Scandinavia (percentage of working population and absolute numbers), 2014



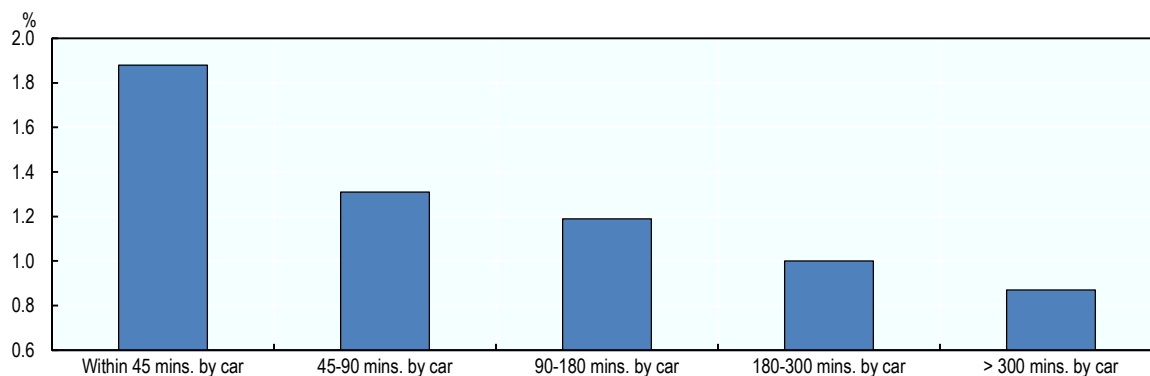
*Note:* Borders delineate the regions of Oslo, Akershus and Ostfold in Norway and Västra Götalands Län, Hallands Län and Skane Län in Sweden. The sizes of the circles indicate the working population in a given municipality. The larger the circle is, the bigger the working population. The three Functional Urban Areas are Oslo, Gothenburg and Malmö (from north to south).

*Source:* OECD (2018<sup>[32]</sup>) based on data from Örestat; Statistics Norway; Statistics Sweden; and Västra Götalandsregionen.

StatLink  <http://dx.doi.org/10.1787/888933708007>

**Figure 2.11. Per capita GDP growth is higher in regions that are close to large metro areas**

Annual average per capita GDP growth controlling for country effects and initial per capita GDP levels, 1995-2010



Source: OECD (2015<sub>[21]</sub>) and Ahrend and Schumann (2014<sub>[33]</sub>).

StatLink  <http://dx.doi.org/10.1787/888933708026>

### Agglomeration costs balance agglomeration benefits, creating space for second tier cities and city networks

Larger cities create benefits, but as benefits grow, so do “agglomeration costs”. These costs can be pecuniary (e.g. higher housing costs and higher costs for goods or services) but also non-pecuniary (e.g. pollution or congestion). That benefits are balanced by increasing costs is perhaps unsurprising. If there were no drawbacks to locating in an ever-growing megacity, people should keep flocking towards the largest metro areas and smaller cities and rural would depopulate. But costs and benefits increase in parallel, reducing the pull of larger cities.

Empirical estimates for Germany find that the cost-of-living in urban areas increases, on average, at the same rate as agglomeration benefits raise productivity and wages.<sup>39</sup> Similarly, the expenditure for housing in France increases with city size (and population density) at roughly the same rate as the city creates agglomeration benefits. The increase comes as housing and land prices increase disproportionately as cities become denser. If growth can be managed and the available land area adapted to population growth, the returns in the long run are positive and appear to be linearly increasing with city size (Combes, Duranton and Gobillon, 2016<sub>[34]</sub>).

Increasing concentration of economic activity in few or individual “megacities” is also associated with increasing inequality within countries (see also “Inaction comes at the price of growing inequality and a “geography of discontent”). This growing imbalance can limit growth potential outside of the main cities and threaten social coherence within countries. The aim to “balance” economic development is therefore common across many regional development strategies. Korea, for example, has enshrined balanced development in law since 2004. The National Balanced Development Act has been maintained, pursued and amended by all subsequent administrations. Among the efforts to distribute economic and political activity across Korea was the creation of an inter-ministerial Presidential Committee on Balanced National Development, renamed Presidential Committee on Regional Development in 2009, which consisted of 12 ministers and 19 experts in 2015. Efforts also included the development of the Sejong

Special Autonomous City in July 2012, the country's new "administrative capital", where 36 national government agencies and 9 ministries were located as of 2014.<sup>40</sup>

As costs increase with the size of a city, a well-connected "megaregion" with rural areas and a network of smaller, but well-connected cities, could provide agglomeration benefits while limiting the costs from congestion and densification. The fastest growing firms in Germany's famous *Mittelstand* are more likely to be located in the small and less-densely populated municipalities along the main arterial highways that connect the major cities rather than in the cities themselves.<sup>41</sup> The Randstad in the Netherlands leverages complementarities between the four largest cities and the smaller cities around the "Green Heart", which it covers.<sup>42</sup> It combines one of the largest airports in Europe (Amsterdam Airport Schiphol), the largest port (Port of Rotterdam) and the Dutch centre for public administration and services (The Hague). The links are supported by a strong transport network between the major cities with train trips of less than 40 minutes between the major cities.<sup>43</sup>

Whether the costs and benefits of a megaregion or a connected "system of cities" outweigh those associated with concentration in large metropolitan areas is an open question. Borrowed agglomeration benefits are unlikely to match actual agglomeration benefits and connecting cities with high-frequency, reliable and uncongested transport facilities is costly. It also increases the flow of traffic and related environmental costs. Conversely, the provision of housing, the density in which people live and the dispersion of pollution likely benefit residents of a megaregion. Though over time, there might be an uneven development within the megaregion that leads to concentration in the area. Likewise, a study on five megaregions in China finds that between 1990 and 2010 the population concentrated increasingly in the larger cities of the megaregions (Tan, 2017<sub>[35]</sub>).

## Notes

1. Already famously pointed out in 1776 by Adam Smith in his "Wealth of Nations" (Smith, 1776<sub>[37]</sub>).
2. Frontier regions are the most productive regions (here TL3 regions) in a country and account for at least 10% of total national employment. The frontier is selected based on the whole sample period and includes all regions that were among the most productive regions in their country in at least half of the years during the first half of the growth period.
3. If the share of tradable sectors in total GVA is greater than the share of tradable employment, tradable sectors are more productive than non-tradable sectors.
4. See Hlatshwayo and Spence (2014<sub>[42]</sub>) for a discussion of the impact of relative tradable productivity growth and non-tradable employment growth in the United States. Note that the definition of tradables in this report covers the same sectors but has to rely on a coarser industrial classification and is therefore not directly comparable.
5. During this period Korea became increasingly open to agricultural trade as a result of the EU-South Korea free trade agreement, which went into effect provisionally in July 2011, and the U.S.-Korea Trade Agreement (KORUS), which entered into force in 2012. This has raised concerns about the repercussions on internal food security and social

- coherence. Sources for dates on trade agreements: <http://ec.europa.eu/trade/policy/countries-and-regions/countries/south-korea/> (accessed 22 December 2017) and [www.fas.usda.gov/data/us-agriculture-reaps-benefits-free-trade-agreement-korea](http://www.fas.usda.gov/data/us-agriculture-reaps-benefits-free-trade-agreement-korea) (accessed 22 December 2017), Employment data: OECD Regional Statistics [Database].
6. Productivity refers to total factor productivity, i.e. the combined productivity of capital and labour. See Greenstone, Moretti and Hornbeck (2010<sub>[44]</sub>) for details.
  7. Non-tradable sectors and firms can, of course, also increase their productivity. The contribution of productivity improvements in retail trade in the United States contributed nearly as much as the IT-producing industries to productivity growth in the country between the late-1980s and 2004 (Byrne, Fernald and Reinsdorf, 2016<sub>[51]</sub>). This development was driven by large national retail chains entering local markets and by the new, high-productivity establishments replacing existing lower productivity ones (Foster, Haltiwanger and Krizan, 2006<sub>[45]</sub>).
  8. This idea of “lean” manufacturing and the relative advantages of different modes of production are discussed by Krafcik (1988<sub>[41]</sub>) and created a whole literature on the management of lean production systems.
  9. See Cusumano (1988<sub>[47]</sub>) for a brief summary of the changes introduced by Toyota and the channels through which they had an impact on productivity, as well as relative productivity estimates: Throughout the 1970s and 1980s Toyota’s vehicle productivity was more than twice the average across US producers (taking vertical integration, capacity utilisation and labour hour differences into account).
  10. See [www.biat.uni-flensburg.de/kfz-neuordnung/default.htm](http://www.biat.uni-flensburg.de/kfz-neuordnung/default.htm) (accessed 06 November 2017)
  11. The 16 automotive companies in the World’s top-100 largest advertisers spend USD 47 billion in 2015 (<http://adage.com/article/advertising/world-s-largest-advertisers/306983/>, accessed 06 November 2017). The GDP in USD at current prices and exchange rates was USD 41.4 billion in Lithuania and USD 43.1 billion in Slovenia.
  12. Both low-income and low-growth regions have been defined as part of the EU Lagging Regions Initiative (European Commission, 2017<sub>[26]</sub>). Low-growth regions are identified among the less-developed and transition regions (i.e. those with 75% or less/90% or less than average per capita GDP in the EU).
  13. See Ye, Meng and Wei (2015<sub>[36]</sub>) for empirical evidence on the “smile curve” that shows higher value added in upstream and downstream parts of the production.
  14. The unemployment rate for Germany was 5.4% in October 2017; 11.7% in Gelsenkirchen and 11.8% in Duisburg. <https://statistik.arbeitsagentur.de/Navigation/Statistik/Statistik-nach-Regionen/Politische-Gebietsstruktur-Nav.html> and <https://statistik.arbeitsagentur.de/Navigation/Statistik/Statistik-nach-Regionen/BA-Gebietsstruktur/Nordrhein-Westfalen/bis-09-2012/Nordrhein-Westfalen-bis-09-2012-Nav.html> (accessed 09 November 2017).
  15. The “Rust Belt” is the area from the Great Lakes to the Upper Midwest States, albeit analysis uses varying delineations. Alder, Lagakos and Ohanian (2014<sub>[58]</sub>) consider Illinois, Indiana, Michigan, New York, Ohio, Pennsylvania, West Virginia and Wisconsin part of the “Rust Belt”, while Blanchard and Katz (1992<sub>[52]</sub>) focus on Illinois, Indiana, Ohio and Michigan.
  16. Mokyr, Vickers and Ziebarth (2015<sub>[38]</sub>) discuss the development of employment and incomes in the wake of the industrial revolution.

17. Data for US salaries from [www.sokanu.com/careers/](http://www.sokanu.com/careers/) (accessed 10 November 2017).
18. See Acemoglu and Autor (2011<sub>[14]</sub>) for detailed trends for the United States and other OECD countries.
19. See Autor, Levy and Murnane (2003<sub>[56]</sub>) for a classification of routine jobs and its relation to technological change. Examples are provided by the authors. Being “Routine” does not necessarily mean the job is devoid of technological progress. The authors give “truck driving” as a non-routine manual task, but advances in autonomous driving are rapidly shifting this view.
20. See Autor, Katz and Kearney (2008<sub>[54]</sub>) for a discussion of skill-biased technological change, inequality and polarisation in the United States.
21. Acemoglu, Gancia and Zilibotti (2015<sub>[61]</sub>) study how technological progress is linked to offshoring from more to less-advanced economies and what effect this link has on wages. Offshoring makes less skill-intensive products cheaper, which increases investment in (innovation in) skill-intensive products, at least at low levels of offshoring.
22. Early research found that computerisation played an important role in explaining growing wage differentials (Krueger, 1993<sub>[40]</sub>), but similar results can be found when considering the impact of pencil use (DiNardo and Pischke, 1997<sub>[46]</sub>), which points to unobserved underlying drivers of both computerisation and returns to skills.
23. Empirical research on the returns to education since the seminal contribution by Mincer (1974<sub>[39]</sub>) finds positive returns to education, but the true extent is difficult to ascertain as educational choices depend on innate and acquired skills (Card, 2001<sub>[49]</sub>). For a recent contribution that aims to combine structural modelling and robust estimation of treatment effects for schooling see Heckman, Humphries and Veramendi (2016<sub>[43]</sub>).
24. Based on the Observatory of Economic Complexity, available at [https://atlas.media.mit.edu/en/visualize/tree\\_map/hs92/export/chn/all/show/2001/](https://atlas.media.mit.edu/en/visualize/tree_map/hs92/export/chn/all/show/2001/) (accessed 13 November 2017).
25. “By 2007, China accounted for over 40 percent of US imports in four four-digit SIC industries (luggage, rubber and plastic footwear, games and toys, and die-cut paperboard) and over 30 percent in 28 other industries, including apparel, textiles, furniture, leather goods, electrical appliances, and jewellery.” (Autor, Dorn and Hanson, 2013, p. 2123<sub>[57]</sub>).
26. Comparison of commuting zones defined as agglomerations of US counties. More/less exposed commuting zones are those at the 75th/25th percentile of the exposure distribution to Chinese import growth between 2000 and 2007. Exposure is defined as the change in per worker imports in the industries weighted by the share of total employment in the industries located in the region (Autor, Dorn and Hanson, 2013<sub>[57]</sub>).
27. See Autor et al. (Autor et al., 2014<sub>[55]</sub>) for evidence on manufacturing workers in the United States.
28. Population at the grid cell level for Europe in municipalities (or other local units) outside of Europe. The threshold is 80% of the population in grid cells with at least 300 inhabitants per km<sup>2</sup> for Europe and 85% of population in local units with similar density levels in other countries. See Bachtler et al. (2017<sub>[53]</sub>) for productivity frontier regions in Europe. Among larger (TL2) OECD countries, the percentage of “mostly urban” regions among the most productive regions is 75% as resource rich rural regions are highly productive in several non-European OECD countries (OECD, 2016<sub>[1]</sub>).
29. The actual difference in 2014 was 30%. See Ahrend, Lembcke and Schumann (2017<sub>[59]</sub>).



30. See the overview article by Combes, Duranton and Gobillon (2011<sub>[48]</sub>).
31. There is also evidence that cities can become victims of their own success. As the urban agglomeration expands and incorporates an increasing number of local administrations (e.g. municipalities), the complexity of co-ordination increases, which appears to accrue a productivity penalty roughly in the same order of magnitude as agglomeration economies (c.f. Chapter 1).
32. For example, Alberta in Canada, Antofagasta in Chile or Groningen in the Netherlands were their countries' regions with the highest labour productivity (gross value added per worker) in 2014 (OECD Regional Statistics [Database]).
33. Predominantly rural areas close to cities are small (territorial level 3, TL3) rural regions in which at least 50% of the population lives within a 60-minute drive of an urban centre with at least 50 000 inhabitants (OECD, 2016<sub>[67]</sub>).
34. See the results and discussions in OECD (2017<sub>[25]</sub>) for details.
35. Italian low-growth regions are an exception for new firm creations as the southern regions have higher birth rates than the north, but the average size remains smaller than in the new firms created in the north. For Portugal there are less firm creations in the lagging parts of the country, but their size is, on average, larger than in Lisbon and on the Portuguese archipelagos.
36. See OECD (2018<sub>[68]</sub>) for details.
37. See Ahrend et al. (2017<sub>[60]</sub>) for evidence on borrowed agglomeration benefits for five OECD countries, Camagni, Capello and Caragliu (2015<sub>[50]</sub>) for evidence for Europe and OECD (2015<sub>[63]</sub>) for a general discussion.
38. See OECD (2015<sub>[21]</sub>) and Ahrend and Schumann (2014<sub>[33]</sub>) for details.
39. Microdata estimates for Germany for 1999-2007 (Ahrend and Lembcke, 2016<sub>[66]</sub>).
40. See OECD (2016<sub>[64]</sub>) and OECD (2017<sub>[62]</sub>) for details.
41. The top-100 companies in the German *Mittelstand* are selected from a sample of about 3 500 companies based on growth in turnover and profits. The *Mittelstand* classification is not based on an official categorisation. It broadly aims to capture medium-sized companies, but many firms in the sample exceed thresholds typically used in terms of size or turnover. [www.munich-strategy.com/de/publikationen/branchenstudien/management-reader/top-100-ranking-des-mittelstands-2016.html](http://www.munich-strategy.com/de/publikationen/branchenstudien/management-reader/top-100-ranking-des-mittelstands-2016.html) (accessed 09 November 2017).
42. See OECD (2007<sub>[65]</sub>) for a delineation of the Randstad.
43. See OECD (2016<sub>[30]</sub>) for details on the metro areas of Rotterdam-The Hague and connections to Amsterdam (the longest link between major cities in the Randstad).

## References

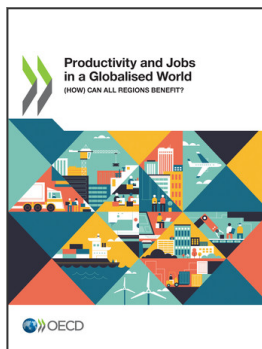
- Acemoglu, D. and D. Autor (2011), “Skills, Tasks and Technologies: Implications for Employment and Earnings”, in Card, D. and O. Ashenfelter (eds.), *Handbook of Labor Economics*, Elsevier. [14]
- Acemoglu, D., G. Gancia and F. Zilibotti (2015), “Offshoring and Directed Technical Change”, *American Economic Journal: Macroeconomics*, Vol. 7/3, pp. 84-122. [61]
- Ahlfeldt, G. and A. Feddersen (2015), “From Periphery to Core: Measuring Agglomeration Effects Using High-Speed Rail”, *SERC Discussion Paper*, No. 172, Spatial Economics Research Centre. [28]
- Ahrend, R. and A. Schumann (2014), “Does Regional Economic Growth Depend on Proximity to Urban Centres?”, *OECD Regional Development Working Papers*, No. 2014/7, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jz0t7fxh7wc-en>. [33]
- Ahrend, R. and A. Lembcke (2016), “Does It Pay to Live in Big(ger) Cities? : The Role of Agglomeration Benefits, Local Amenities, and Costs of Living”, *OECD Regional Development Working Papers*, No. 2016/9, OECD Publishing, Paris, <http://dx.doi.org/10.1787/e0490ba8-en>. [66]
- Ahrend, R., A. Lembcke and A. Schumann (2017), “The Role of Urban Agglomerations for Economic and Productivity Growth”, *International Productivity Monitor, CSLS-OECD Special Issue from the First OECD Global Forum on Productivity*, Vol. 32, pp. 161-179. [59]
- Ahrend, R. et al. (2017), “What Makes Cities More Productive? Evidence From Five OECD Countries on the Role of Urban Governance”, *Journal of Regional Science*, Vol. 57/3, pp. 385-410. [60]
- Alder, S., D. Lagakos and L. Ohanian (2014), “Competitive Pressure and the Decline of the Rust Belt: A Macroeconomic Analysis”, *NBER Working Paper*, No. 20538, National Bureau of Economic Research. [58]
- Andrews, D., C. Criscuolo and P. Gal (2015), “Frontier Firms, Technology Diffusion and Public Policy: Micro Evidence from OECD Countries”, *OECD Productivity Working Papers*, No. 2, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jrql2q2jj7b-en>. [27]
- Arntz, M., T. Gregory and U. Zierahn (2016), “The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis”, *OECD Social, Employment and Migration Working Papers*, No. 189, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jlz9h56dvq7-en>. [20]
- Autor, D., F. Levy and R. Murnane (2003), “The Skill Content of Recent Technological Change: An Empirical Exploration”, *The Quarterly Journal of Economics*, Vol. 118/4, pp. 1279-1333. [56]
- Autor, D., L. Katz and M. Kearney (2008), “Trends in U.S. Wage Inequality: Revising the Revisionists”, *The Review of Economics and Statistics*, Vol. 90/2, pp. 300-323. [54]
- Autor, D., D. Dorn and G. Hanson (2013), “The China Syndrome: Local Labor Market Effects of Import Competition in the United States”, *American Economic Review*, Vol. 103/6, pp. 2121-2168. [57]
- Autor, D. et al. (2014), “Trade Adjustment: Worker-Level Evidence”, *The Quarterly Journal of Economics*, Vol. 129/4, pp. 1799-1860. [55]

- Bachtler, J. et al. (2017), *Towards Cohesion Policy 4.0: Structural Transformation and Inclusive Growth*, Regional Studies Association (RSA Europe). [53]
- Blanchard, O. and L. Katz (1992), “Regional Evolutions”, *Brookings Papers on Economic Activity*, Vol. 1. [52]
- Byrne, D., J. Fernald and M. Reinsdorf (2016), “Does the United States Have a Productivity Slowdown or a Measurement Problem?”, *Brookings Papers on Economic Activity*, pp. 109-157. [51]
- Camagni, R., R. Capello and A. Caragliu (2015), “The Rise of Second-Rank Cities: What Role for Agglomeration Economies?”, *European Planning Studies*, Vol. 23/6, pp. 1069-1089. [50]
- Card, D. (2001), “Estimating the Return to Schooling: Progress on Some Persistent Econometric Problems”, *Econometrica*, Vol. 69/5, pp. 1127-1160. [49]
- Combes, P., G. Duranton and L. Gobillon (2011), “The Identification of Agglomeration Economies”, *Journal of Economic Geography*, Vol. 11, pp. 253-266. [48]
- Combes, P., G. Duranton and L. Gobillon (2016), “The Costs of Agglomeration: House and Land Prices in French Cities”, *CEPR Working Paper 9240* (revised version). [34]
- Cusumano, M. (1988), “Manufacturing Innovation: Lessons from the Japanese Auto Industry”, *MIT Sloan Management Review*, Vol. 30/1. [47]
- de Avillez, R. (2012), “Sectoral Contributions to Labour Productivity Growth in Canada: Does the Choice of Decomposition Formula Matter?”, *International Productivity Monitor*, Vol. 24, pp. 97-117. [8]
- De Gregorio, J., A. Giovannini and H. Wolf (1994), “International evidence on tradables and nontradables inflation”, *European Economic Review*, Vol. 38/6, pp. 1225-1244. [2]
- Deming, D. (2017), “The Growing Importance of Social Skills in the Labor Market\*”, *The Quarterly Journal of Economics*, Vol. 132/4, pp. 1593-1640. [13]
- DiNardo, J. and J. Pischke (1997), “The Returns to Computer Use Revisited: Have Pencils Changed the Wage Structure Too?”, *The Quarterly Journal of Economics*, Vol. 112/1, pp. 291-303. [46]
- European Commission (2017), “Competitiveness in Low-Income and Low-Growth Regions: The Lagging Regions Report”, *European Commission Staff Working Document*, European Commission. [26]
- Foster, L., J. Haltiwanger and C. Krizan (2006), “Market Selection, Reallocation, and Restructuring in the U.S. Retail Trade Sector in the 1990s”, *The Review of Economics and Statistics*, Vol. 88/4, pp. 748-758. [45]
- Froy, F., S. Giguère and M. Meghnagi (2012), “Skills for Competitiveness: A Synthesis Report”, *OECD Local Economic and Employment Development (LEED) Working Papers*, No. 2012/9, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k98xwskmvr6-en>. [10]
- Fujita, M., P. Krugman and A. Venables (1999), *The Spatial Economy: Cities, Regions and International Trade*, MIT Press, Cambridge. [31]
- Gervais, A. and J. Jensen (2013), “The Tradability of Services: Geographic Concentration and Trade Costs”, *National Bureau of Economic Research*, No. 19759. [4]
- Goos, M. and A. Manning (2007), “Lousy and Lovely Jobs: The Rising Polarization of Work in Britain”, *The Review of Economics and Statistics*, Vol. 89/1, pp. 118-133. [12]

- Goos, M., A. Manning and A. Salomons (2014), “Explaining Job Polarization: Routine-Biased Technological Change and Offshoring”, *American Economic Review*, Vol. 104/8, pp. 2509-2526. [15]
- Greenstone, M., R. Hornbeck and E. Moretti (2010), “Identifying Agglomeration Spillovers: Evidence from Winners and Losers of Large Plant Openings”, *Journal of Political Economy*, Vol. 118/3, pp. 536-598. [44]
- Heckman, J., J. Humphries and G. Veramendi (2016), “Returns to Education: The Causal Effects of Education on Earnings, Health and Smoking”, *NBER Working Papers*, No. 22291, National Bureau of Economic Research, Cambridge, MA, <http://dx.doi.org/10.3386/w22291>. [43]
- Hlatshwayo, S. and M. Spence (2014), “Demand and Defective Growth Patterns: The Role of The Tradable and Non-Tradable Sectors in an Open Economy”, *American Economic Review: Papers & Proceedings*, Vol. 104/5, pp. 272-277. [42]
- Jensen, J. et al. (2005), “Tradable Services: Understanding the Scope and Impact of Services Offshoring [with Comments and Discussion]”, *Brookings Trade Forum*, pp. 75-133. [3]
- Ketels, C. and S. Protsiv (2016), “European Cluster Panorama 2016”, *European Cluster Observatory*. [24]
- Krafcik, J. (1988), “Triumph of the Lean Production System”, *MIT Sloan Management Review*, Vol. 30/1. [41]
- Krueger, A. (1993), “How Computers Have Changed the Wage Structure: Evidence from Microdata, 1984-1989”, *The Quarterly Journal of Economics*, Vol. 108/1, pp. 33-60. [40]
- Mincer, J. (1974), *Schooling, Experience, and Earnings*, National Bureau of Economic Research, Columbia University Press. [39]
- Mokyr, J., C. Vickers and N. Ziebarth (2015), “The History of Technological Anxiety and the Future of Economic Growth: Is This Time Different?”, *The Journal of Economic Perspectives*, Vol. 29/3, pp. 31-50. [38]
- Moretti, E. (2010), “Local Multipliers”, *American Economic Review*, Vol. 100/2, pp. 373-377. [6]
- Moretti, E. and P. Thulin (2013), “Local multipliers and human capital in the United States and Sweden”, *Industrial and Corporate Change*, Vol. 22/1, pp. 339-362. [7]
- OECD (2007), *OECD Territorial Reviews: Randstad Holland, Netherlands 2007*, OECD Territorial Reviews, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264007932-en>. [65]
- OECD (2012), *Promoting Growth in All Regions*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264174634-en>. [29]
- OECD (2013), *Rural-Urban Partnerships: An Integrated Approach to Economic Development*, OECD Rural Policy Reviews, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264204812-en>. [22]
- OECD, WTO and World Bank Group (2014), *Global Value Chains: Challenges, Opportunities and Implications for Policy*, Report prepared for submission to the G20 Trade Ministers Meeting, OECD Publishing, [https://www.oecd.org/tad/gvc\\_report\\_g20\\_july\\_2014.pdf](https://www.oecd.org/tad/gvc_report_g20_july_2014.pdf). [18]
- OECD (2014), *Employment and Skills Strategies in the United States*, OECD Reviews on Local Job Creation, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264209398-en>. [9]
- OECD (2014), *Innovation and Modernising the Rural Economy*, OECD Rural Policy Reviews, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264205390-en>. [23]

- OECD (2015), *The Metropolitan Century: Understanding Urbanisation and its Consequences*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264228733-en>. [63]
- OECD (2015), *The Metropolitan Century: Understanding Urbanisation and its Consequences*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264228733-en>. [21]
- OECD (2016), “Skills for a Digital World: 2016 Ministerial Meeting on the Digital Economy Background Report”, *OECD Digital Economy Papers*, No. 250, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jlwz83z3wnw-en>. [19]
- OECD (2016), *Road Infrastructure, Inclusive Development and Traffic Safety in Korea*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264255517-en>. [64]
- OECD (2016), *OECD Territorial Reviews: The Metropolitan Region of Rotterdam-The Hague, Netherlands*, OECD Territorial Reviews, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264249387-en>. [30]
- OECD (2016), *OECD Territorial Reviews: Bergamo, Italy*, OECD Territorial Reviews, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264251984-en>. [17]
- OECD (2016), *OECD Regional Outlook 2016: Productive Regions for Inclusive Societies*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264260245-en>. [16]
- OECD (2016), *OECD Regional Outlook 2016: Productive Regions for Inclusive Societies*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264260245-en>. [1]
- OECD (2016), *OECD Regions at a Glance 2016*, OECD Publishing, Paris, [http://dx.doi.org/10.1787/reg\\_glance-2016-en](http://dx.doi.org/10.1787/reg_glance-2016-en). [67]
- OECD (2017), *Urban Transport Governance and Inclusive Development in Korea*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264272637-en>. [62]
- OECD (2017), *The Geography of Firm Dynamics: Measuring Business Demography for Regional Development: Demography for Regional Development*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264286764-en>. [25]
- OECD (2017), *OECD Economic Outlook, Volume 2017 Issue 1*, OECD Publishing, Paris, [http://dx.doi.org/10.1787/eco\\_outlook-v2017-1-en](http://dx.doi.org/10.1787/eco_outlook-v2017-1-en). [11]
- OECD (2018), *OECD Territorial Reviews: The Megaregion of Western Scandinavia*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264290679-en>. [32]
- OECD (2018), *OECD Rural Policy Reviews: Poland 2018*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264289925-en>. [68]
- Rodrik, D. (2016), “Premature deindustrialization”, *Journal of Economic Growth*, Vol. 21/1, pp. 1-33. [5]
- Smith, A. (1776), *An Inquiry into the Nature and Causes of the Wealth of Nations*, Project Gutenberg. [37]
- Tan, M. (2017), “Uneven growth of urban clusters in megaregions and its policy implications for new urbanization in China”, *Land Use Policy*, Vol. 66/Supplement C, pp. 72-79. [35]
- Ye, M., B. Meng and S. Wei (2015), “Measuring Smile Curves in Global Value Chains”, *IDE Discussion Paper* 530. [36]





**From:**  
**Productivity and Jobs in a Globalised World**  
**(How) Can All Regions Benefit?**

**Access the complete publication at:**  
<https://doi.org/10.1787/9789264293137-en>

**Please cite this chapter as:**

OECD (2018), "Thinking global, developing local: Tradable sectors, cities and their role for catching up", in *Productivity and Jobs in a Globalised World: (How) Can All Regions Benefit?*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264293137-5-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

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.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to [rights@oecd.org](mailto:rights@oecd.org). Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at [info@copyright.com](mailto:info@copyright.com) or the Centre français d'exploitation du droit de copie (CFC) at [contact@cfcopies.com](mailto:contact@cfcopies.com).