

Chapter 3

Productivity by industry

Labour productivity by main economic activity

Industry contribution to business sector productivity

Labour productivity of business sector services

Contributions to business sector services' productivity

Productivity by enterprise size

Labour productivity by main economic activity

Sectors differ from each other with respect to their productivity growth. Such differences may relate, for instance, to the intensity with which sectors use skilled labour and physical and knowledge-based capital in their production, the scope for product and process innovation, the absorption of external knowledge, the degree of product standardisation, the scope for economies of scale, and the exposure to international competition through their participation in global value chains.

Key findings

Differences in productivity growth rates across countries at the total economy level cannot be explained by differences in economic structures alone as even at the sectoral level significant differences in productivity growth exist across countries; although in general, in most countries, the growth rates in the manufacturing sector have typically outpaced those in the services sector. For instance, between 2009 and 2015, labour productivity growth rates in manufacturing ranged from 0.35% in New Zealand to 9% in the Slovak Republic. In Ireland, corporate restructuring, including through the relocation of firms with significant intellectual property assets and aircraft leasing companies, led to significant increases in labour productivity in 2015.

Compared with pre-crisis rates, labour productivity in manufacturing slowed in most OECD countries after the crisis, particularly in the Czech Republic, Finland and Korea. In business sector services, labour productivity also slowed after the crisis, notably in Estonia, Greece, Latvia and, to a lesser extent, the United Kingdom.

Definition

Labour productivity is defined as real gross value added per hour worked. The non-agricultural business sector, excluding real estate, covers mining and quarrying; manufacturing; utilities; construction; and business sector services. The latter covers wholesale and retail trade, repair of motor vehicles and motor cycles; accommodation and food services; transportation and storage; information and communication services; financial and insurance activities; and professional, scientific and support activities. This publication presents sectoral productivity growth for those countries for which sectoral data for real gross value added (in basic prices) and total hours worked by all persons employed (employees and self-employed) are available by ISIC Rev.4 breakdown in the *OECD National Accounts Statistics* (database).

Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

Comparability

The comparability of productivity growth across industries and countries may be affected by problems in measuring real value added. This is particularly relevant for services, as measurement of price changes is complicated by difficulties in identifying quality changes and the provision of bundled services (Chapter 6). In some industries, estimates of real value added may be based on a sum-of-costs approach, which deflates, using some assumptions, compensation of employees in the specific sector. For example, most countries assume no change in labour productivity for public administration activities, which is why this industry is not included here. Real estate services are also excluded, as their value added includes the imputation made for the dwelling services provided and consumed by home-owners.

Sources and further reading

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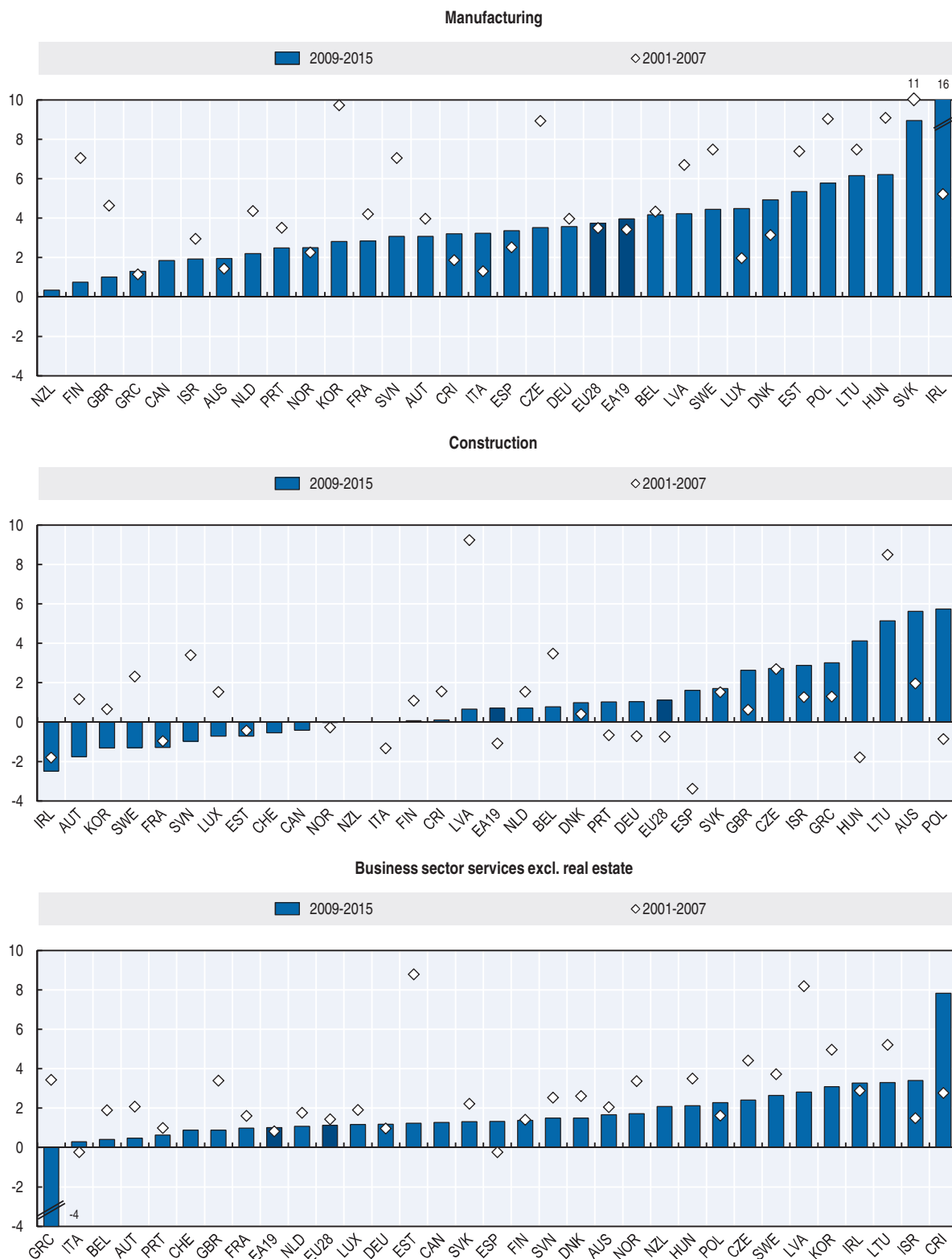
OECD Productivity Statistics (database), <http://dx.doi.org/10.1787/pdtvy-data-en>.

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Figure 3.1. **Labour productivity by main economic activity**
Real gross value added per hour worked, percentage change at annual rate



StatLink  <http://dx.doi.org/10.1787/888933477340>

Industry contribution to business sector productivity

Understanding the drivers of productivity growth in the business sector requires an awareness of the contribution that each industry makes. The contribution of an individual sector depends not only on its productivity growth but also on its share in total value added and total hours worked.

Key findings

Over the past 15 years, labour productivity growth was almost entirely driven by manufacturing and business sector services. In the case of manufacturing, this reflects the typically higher productivity growth rates of the sector. In the case of business sector services, the strong contribution also reflects its increasing share in the overall economy. Excluding real estate, business sector services account for about 35 to 50% of total value added and total employment across OECD countries.

When contributions to business sector productivity growth are analysed before and after the crisis, important differences arise. In the Czech Republic, Finland, Slovenia and the Slovak Republic, the productivity slowdown was mainly driven by lower contributions from the manufacturing sector compared with the pre-crisis period. In the Baltic States, Greece and the United Kingdom, the slowdown was driven by lower contributions from business sector services.

Definition

Labour productivity growth by industry is defined as the rate of change of real gross value added (in basic prices) per hour worked. The contribution of each sector to labour productivity growth of the total business sector is computed as the difference between the growth rate of value added and that of hours worked, with each weighted by the sector's share in total nominal value added and total hours worked respectively. Data are presented for those countries for which real gross value added and hours worked by sector are available by ISIC Rev.4 breakdown in the *OECD National Accounts Statistics* (database). Hours worked comprises the total number of hours worked by all persons employed, i.e. employees and self-employed.

Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

Comparability

Business sector refers to non-agricultural business sector excluding real estate activities. Real estate activities are excluded, as value added in this sector includes the imputation made for the dwelling services provided and consumed by home-owners.

In addition to the difficulties encountered in measuring real value added, particularly in the services sector, it is also difficult to accurately measure nominal output in some cases. This is for example the case for the financial services sector, where some financial intermediation services, such as implicit banking charges, are indirectly measured.

Under- or over-estimation of the output of a particular sector, notably for services, will be partially offset by intermediate consumption of this output by other production sectors, and hence their value added. Therefore, while this mis-measurement may have an impact on the comparability across sectors, it may have a smaller impact on overall productivity growth.

Sources and further reading

Ahmad, N. et al. (2003), "Comparing Labour Productivity Growth in the OECD Area: The Role of Measurement", *OECD Science, Technology and Industry Working Paper 2003-14*, <http://dx.doi.org/10.1787/126534183836>.

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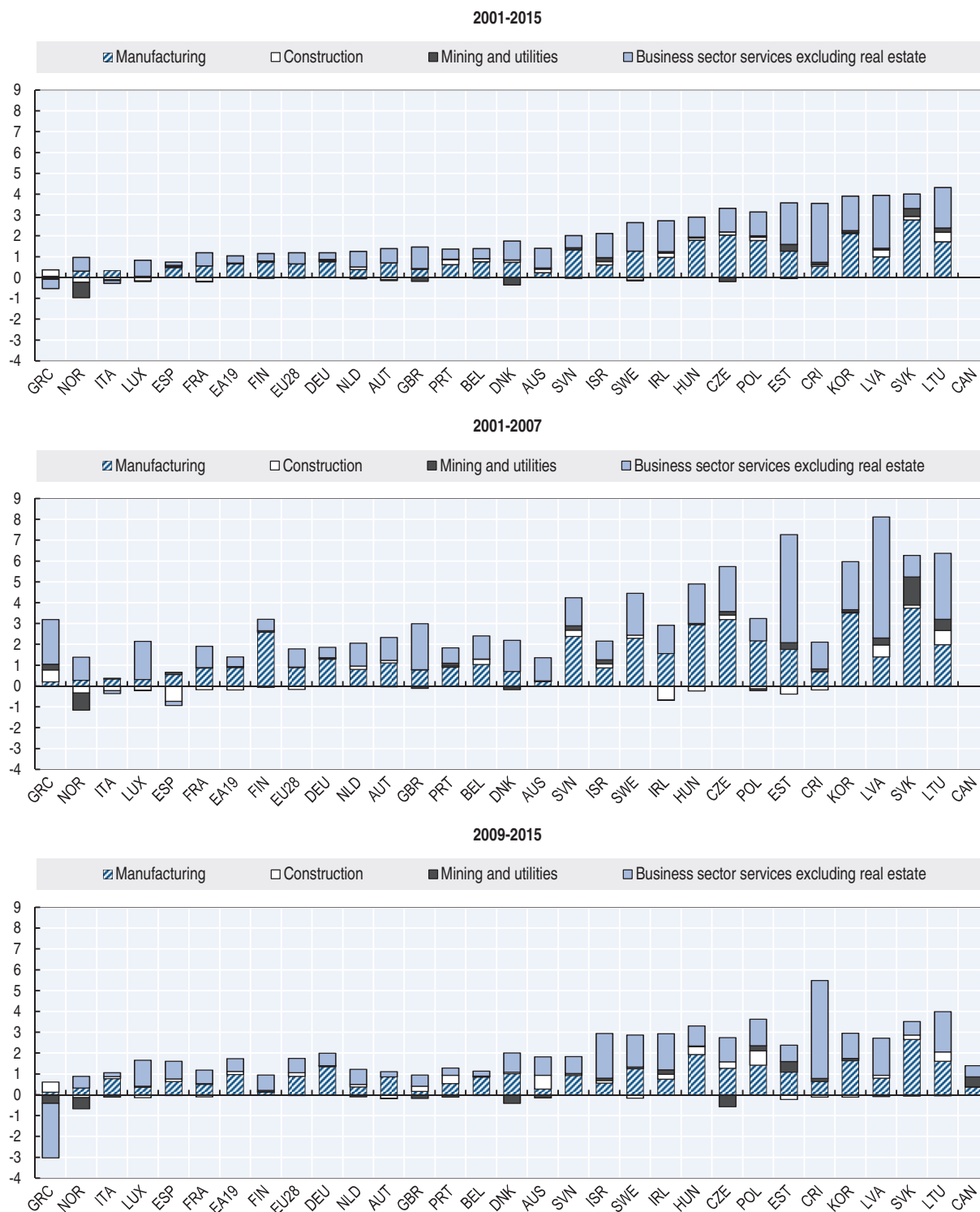

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Figure 3.2. **Industry contribution to business sector productivity growth**

Real gross value added per hour worked, percentage point contribution at annual rate

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Labour productivity of business sector services

Developments in information and communication technologies (ICT) combined with internationally fragmented production processes are making business services increasingly dynamic, transportable and tradeable. As a result, several business sector services show characteristics similar to high-productivity manufacturing industries; they intensively use ICT and knowledge-based capital, exploit economies of scale, and are increasingly exposed to international competition.

Key findings

Labour productivity growth varies substantially across business sector services. In the pre-crisis period, services that are traded internationally and thus with a higher exposure to international competition, such as information and communication services and finance and insurance activities, showed labour productivity growth rates that were as high as or even higher than those in the manufacturing sector. However, post the crisis, labour productivity growth in manufacturing was higher in most countries than in finance and insurance and information and communication services.

Labour productivity growth decelerated significantly in finance and insurance services in most countries, with negative growth rates in countries whose banking sectors were severely hit by the crisis, such as Portugal, Spain and the United Kingdom. Productivity growth also slowed considerably in information and communication services, especially in Austria, Estonia, Greece, Latvia and the Slovak Republic. Costa Rica and Ireland, on the other hand, recorded the highest labour productivity growth in information and communication services in the post-crisis period, reflecting increasing flows of high-tech foreign direct investment in the case of Costa Rica and IT multinationals in Ireland.

Definition

Labour productivity growth by industry is defined as the rate of growth in real gross value added (in basic prices) per hour worked by industry. The figures present sectoral productivity growth for those countries which data on real gross value added and hours worked by sector are available by ISIC Rev.4 breakdown in the OECD National Accounts Statistics (database).

The business sector services covers wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage as well as accommodation and food services – presented here as “distributive trade, repairs; transport; accommodation, food services” –; information and communication services; financial and insurance activities; and professional, scientific and support activities.

Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

Comparability

The comparability of productivity growth across industries and countries may be affected by problems in measuring real value added. This is particularly relevant for those business sector services where it is difficult to isolate price effects that are due to changes in the quality (or in the mix of services provided as a bundle) from pure price changes. Despite substantial progress made over the past 15 years in compiling service producer price indices (SPPIs), the methods used to compute constant price value added still vary across countries, affecting the measurement of productivity growth (Chapter 6).

Real estate activities are excluded from the business sector services, as their value added includes the imputation made for the dwelling services provided and consumed by home-owners.

Data on hours worked by sector are sourced from the OECD National Accounts Statistics (database). Certain services sectors are characterised by a high degree of part-time work and self-employment, which can affect the quality of estimates of actual hours worked.

Sources and further reading

OECD Productivity Statistics (database), <http://dx.doi.org/10.1787/pdtyv-data-en>.

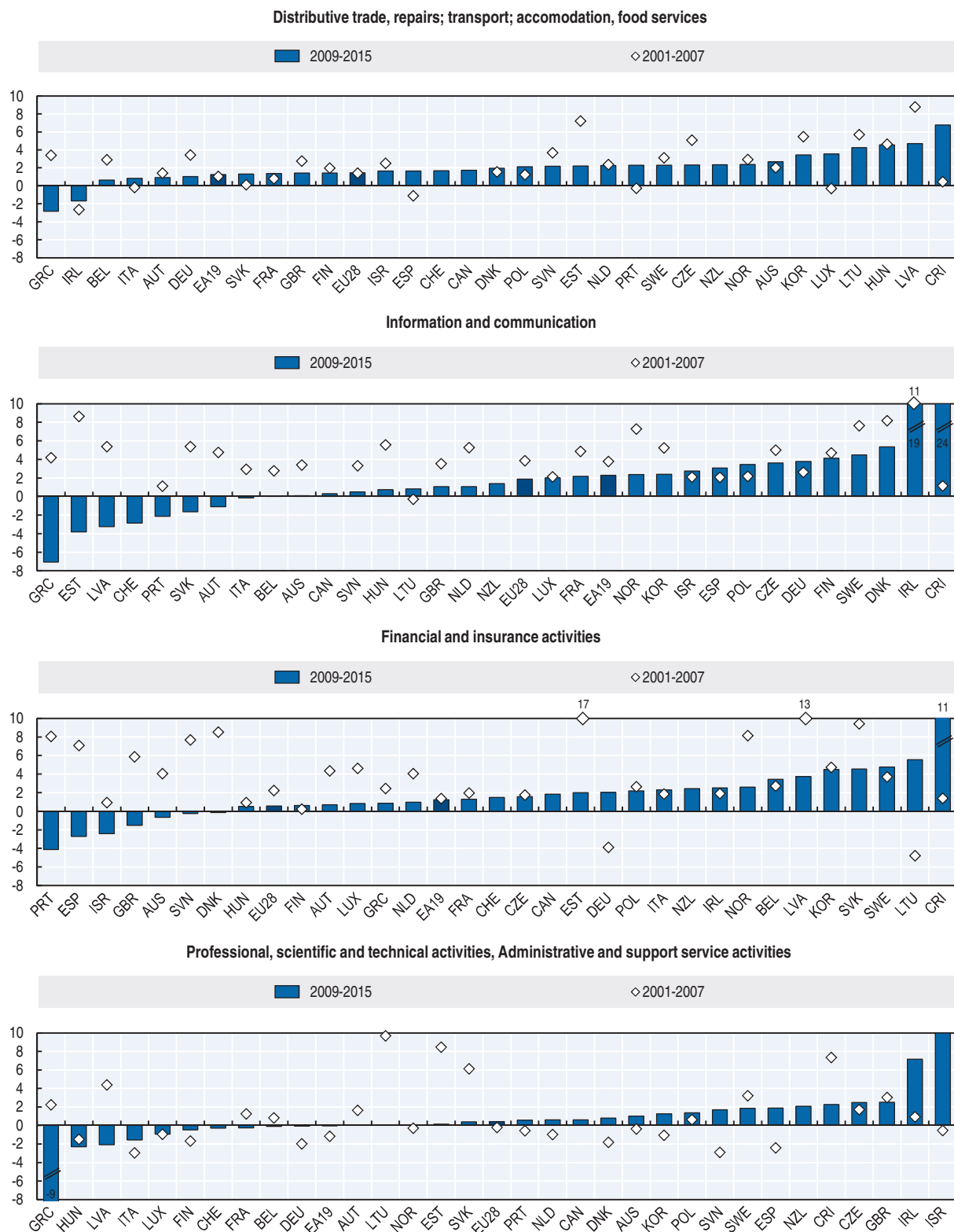
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Figure 3.3. **Labour productivity by business sector services**

Real gross value added per hour worked, percentage change at annual rate

StatLink <http://dx.doi.org/10.1787/888933477368>

Contributions to business sector services' productivity

The business services sector has contributed significantly to GDP growth across OECD countries in recent decades, driven in large part by an increase in firms providing intermediate services to other firms, also in the manufacturing sector. This process of outsourcing activities previously conducted in-house has increased efficiencies, and hence, labour productivity, of both outsourcing firms and specialised intermediary firms. Over the long term, this may produce a structural shift towards intermediate services industries and a direct positive contribution of high productivity business services to productivity growth of the total economy.

Key findings

For most OECD countries, labour productivity growth in the business sector services over the past 15 years was mainly driven by distributive trade, hotels and transport services, and finance and insurance activities. In the case of finance and insurance services, this mainly reflected strong productivity growth. For trade, hotels and transport services, it was essentially due to the large shares of this sector in total business sector services value added and hours worked.

However, since the crisis, the contribution to business services' labour productivity growth by the information and communication and finance and insurance sectors slowed sharply in most OECD countries.

Definition

The contribution of each services sector to labour productivity growth of the total business sector services is computed as the weighted difference between the growth rate of real gross value added and that of hours worked. The weights are computed as each individual sector's share in nominal gross value added and total hours worked respectively of total business sector services. Business sector services include wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage as well as accommodation and food services – presented here as “trade, hotels and transport” –; information and communication services; financial and insurance activities; and professional, scientific and support activities – reported here as “professional services”.

Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

Comparability

The contribution of one services industry to total business sector services productivity depends critically on its share in total nominal value added and total hours worked. In addition to the difficulties encountered in measuring price changes in the services sector, for some services, it is also difficult to accurately measure nominal output and value added. In financial activities, for example, the services provided are not always explicitly charged for and can only be measured indirectly.

Sources and further reading

OECD Productivity Statistics (database), <http://dx.doi.org/10.1787/pdtvy-data-en>.

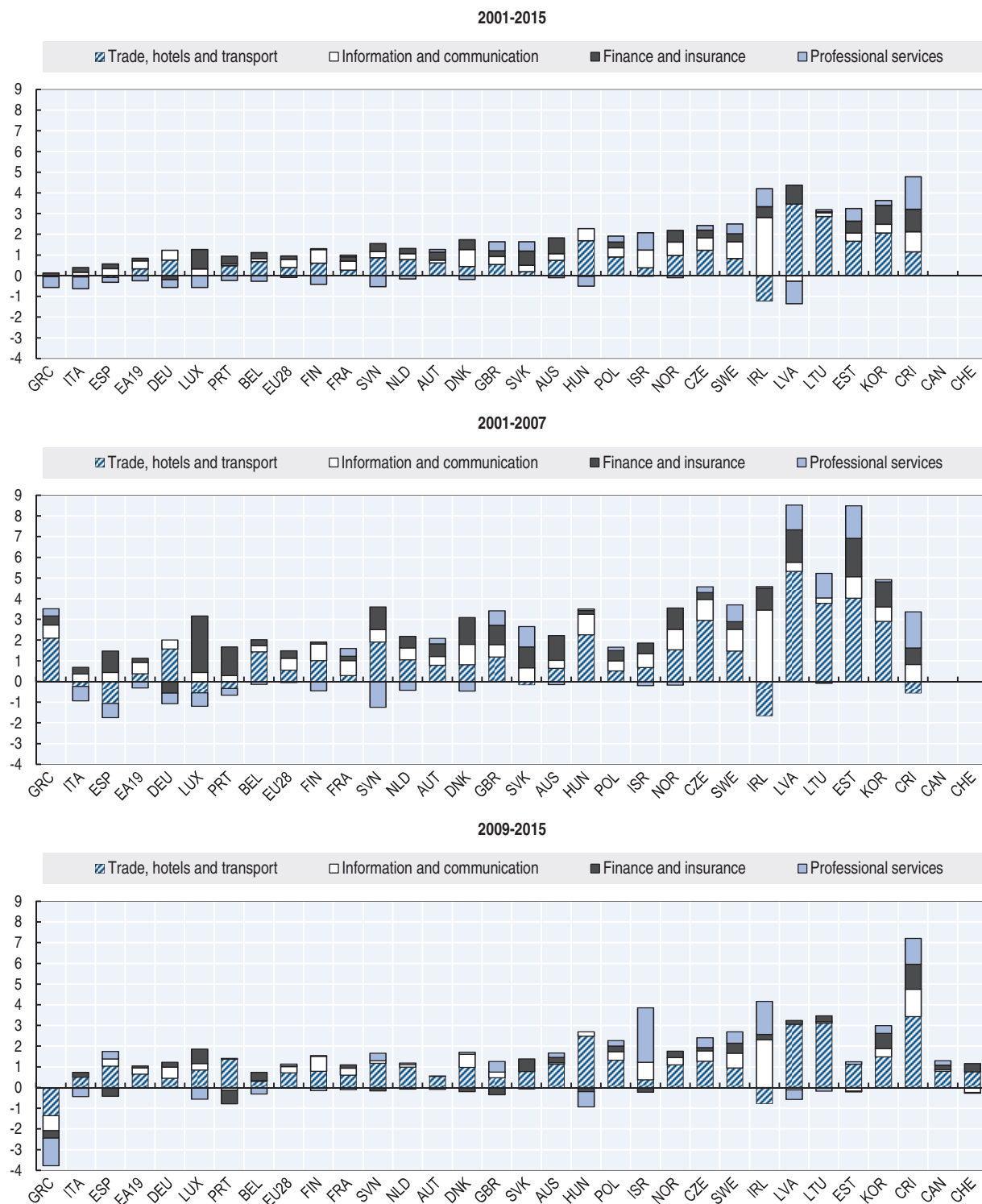

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Figure 3.4. **Contributions to productivity growth of business sector services**

Real gross value added per hour worked, percentage point contribution at annual rate

StatLink  <http://dx.doi.org/10.1787/888933477377>

Productivity by enterprise size

Many examples of productivity analyses typically focus on relatively aggregated industries, masking the heterogeneity in productivity among firms within the same sector and, in particular, the contribution of SMEs, recognised as important drivers of growth as they scale-up. In this sense, firm heterogeneity matters for productivity. To the extent that large firms can exploit increasing returns to scale, productivity tends to increase with firm size. However, new small firms are often found to spur aggregate productivity growth as they enter with new technologies and stimulate productivity-enhancing changes by incumbents.

Key findings

Larger firms are on average more productive than smaller ones, particularly in the manufacturing sector, partly reflecting increasing returns to scale, for instance, through capital intensive production. But smaller firms can outperform larger firms, particularly in the services sector, reflecting competitive advantages in niche, high brand or high intellectual property content activities as well as the intensive use of affordable ICT. In most countries, labour productivity gaps between micro and, to a lesser extent small and medium-sized firms, and large firms are relatively high, in particular, in the manufacturing sector. However, differences in productivity across size classes are relatively smaller in the business services sector.

In many economies, post-crisis labour productivity growth was broadly similar in SMEs and large enterprises in manufacturing but more varied in the business services sector. However, in some countries, like Italy and Spain, productivity growth both in SMEs and large firms in manufacturing occurred against a backdrop of declining employment.

Definition

Labour productivity by enterprise size class is measured as gross value added in current prices per person employed. Labour input is measured as total employment, which includes employees and all other paid or unpaid persons who worked for the concerned unit during the reference year. Data on hours worked by all persons employed are typically not available by industry and enterprise size class.

In the OECD *Structural and Demographic Business Statistics* (database), business economy covers: mining and quarrying, manufacturing, electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and remediation activities, construction and business services (excluding finance and insurance activities). Business services include wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food services; information and communication services; real estate activities; and professional and support activities.

Comparability

Value added estimates for different enterprise size classes are based on OECD *Structural and Demographic Business Statistics* (database) and will typically not align with estimates in national accounts. The latter include a number of adjustments to reflect businesses and activities that may not be covered in structural business statistics, such as those made to reflect the Non-Observed Economy. Since labour input is measured as total employment, comparability of labour productivity measures by size class may be affected by differences in the share of part-time employment. In addition, productivity differences in main aggregate sectors could mask different productivity patterns in more narrowly defined industries. This may in turn reflect differences in the value of goods and services produced, as well as different intensities in the use of knowledge-based capital.

Sources and further reading

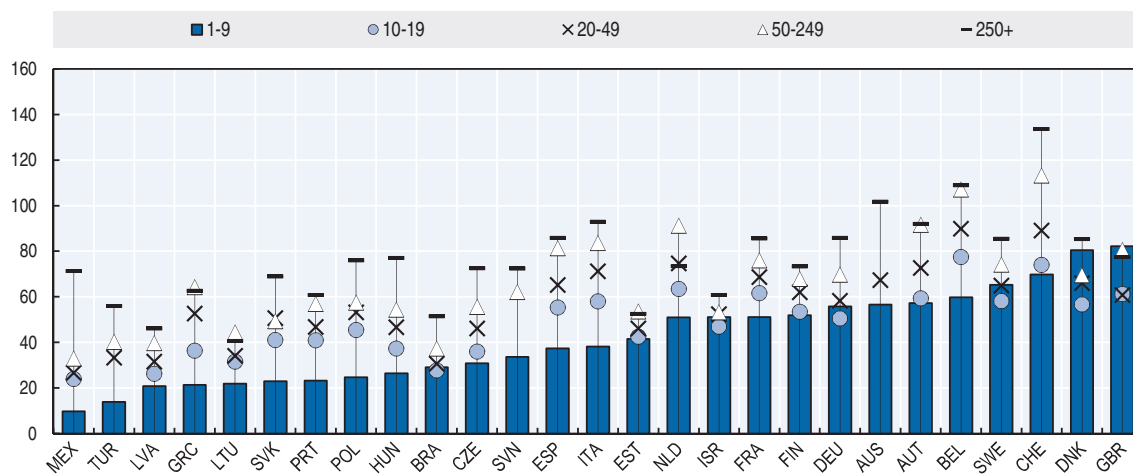

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Figure 3.5. **Labour productivity by firm size, business economy**

Value added per person employed, thousands of USD, current PPPs, 2014, or latest available year

StatLink  <http://dx.doi.org/10.1787/888933477384>Figure 3.6. **Labour productivity by firm size, manufacturing and business services**

Value added per person employed, index 250+ = 100, 2014, or latest available year

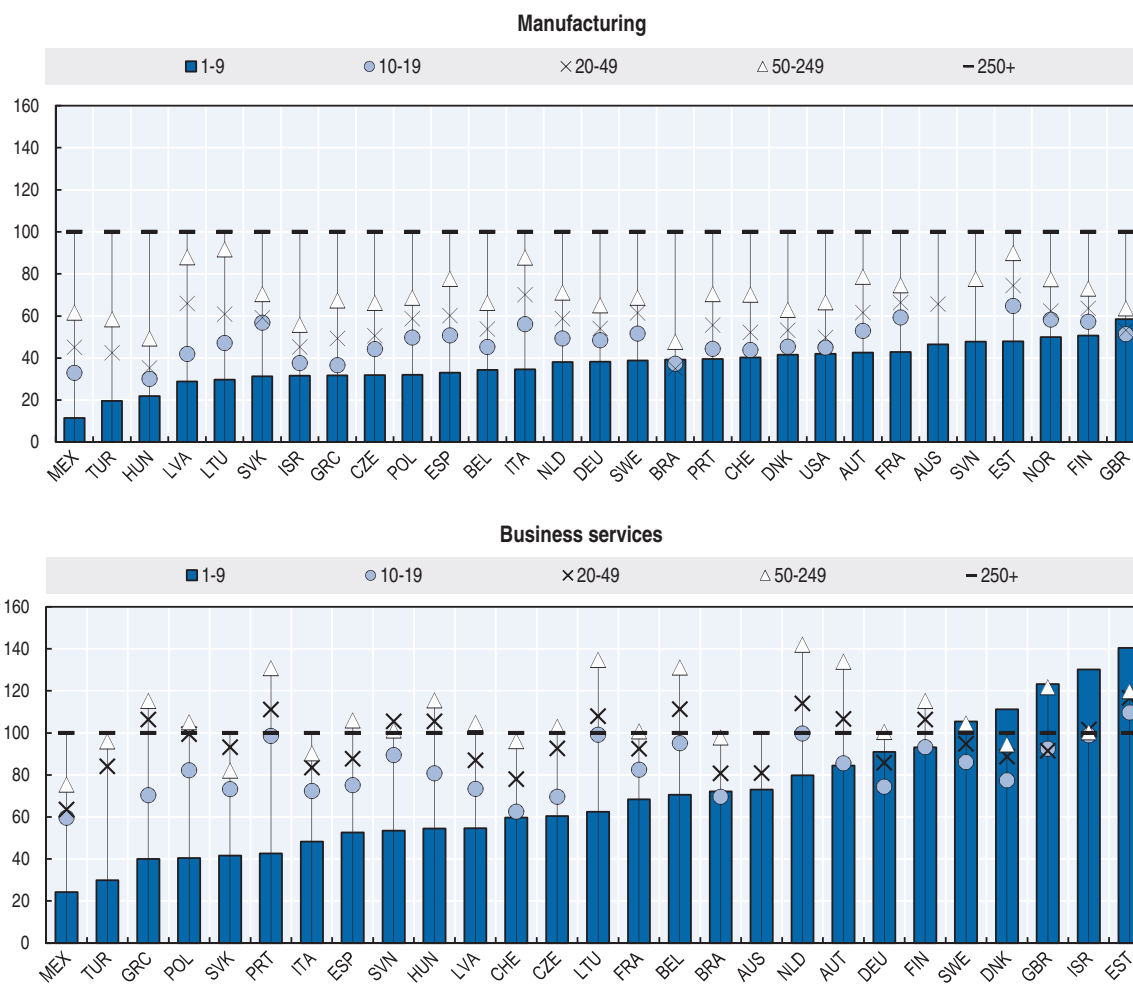

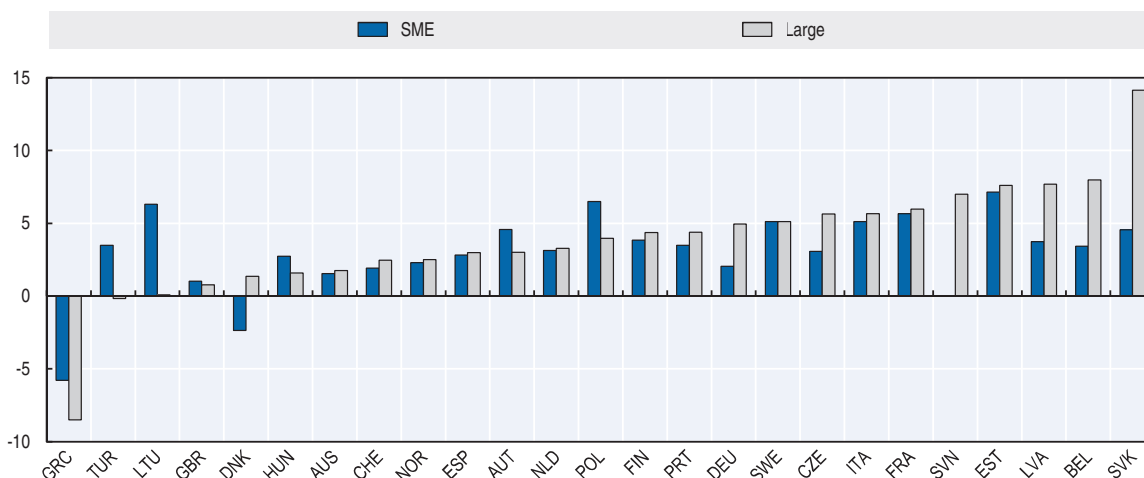
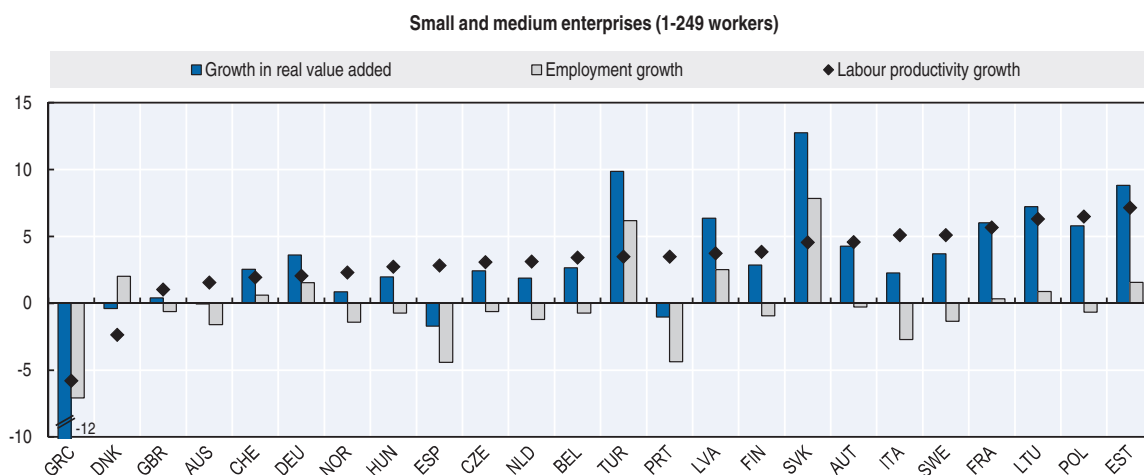
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Figure 3.7. Labour productivity growth by firm size, manufacturing
 Real value added per person employed, average annual rate, percentage, 2009-14 or latest available year



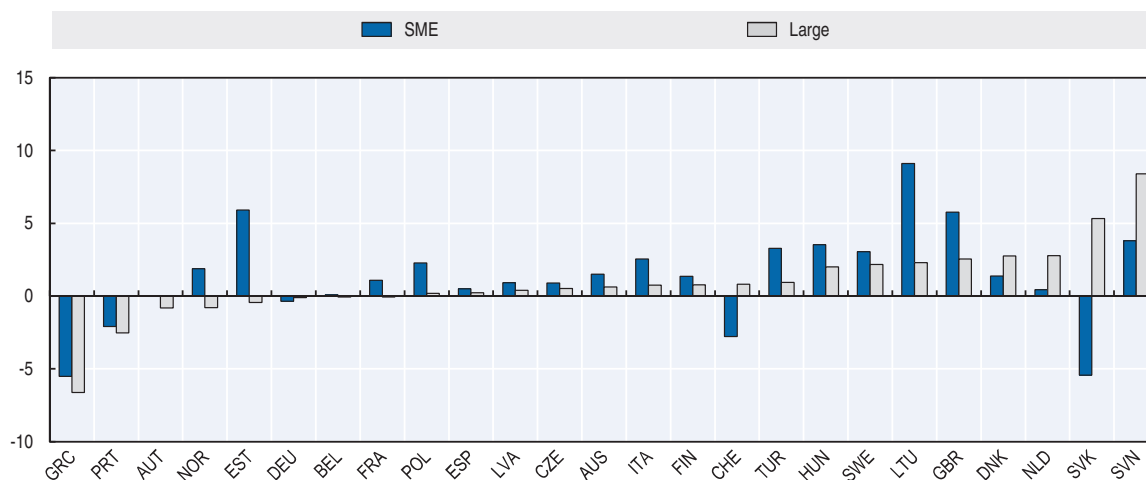
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Figure 3.8. Growth in real value added and employment by firm size, manufacturing
 Average annual rate, percentage, 2009-14 or latest available year



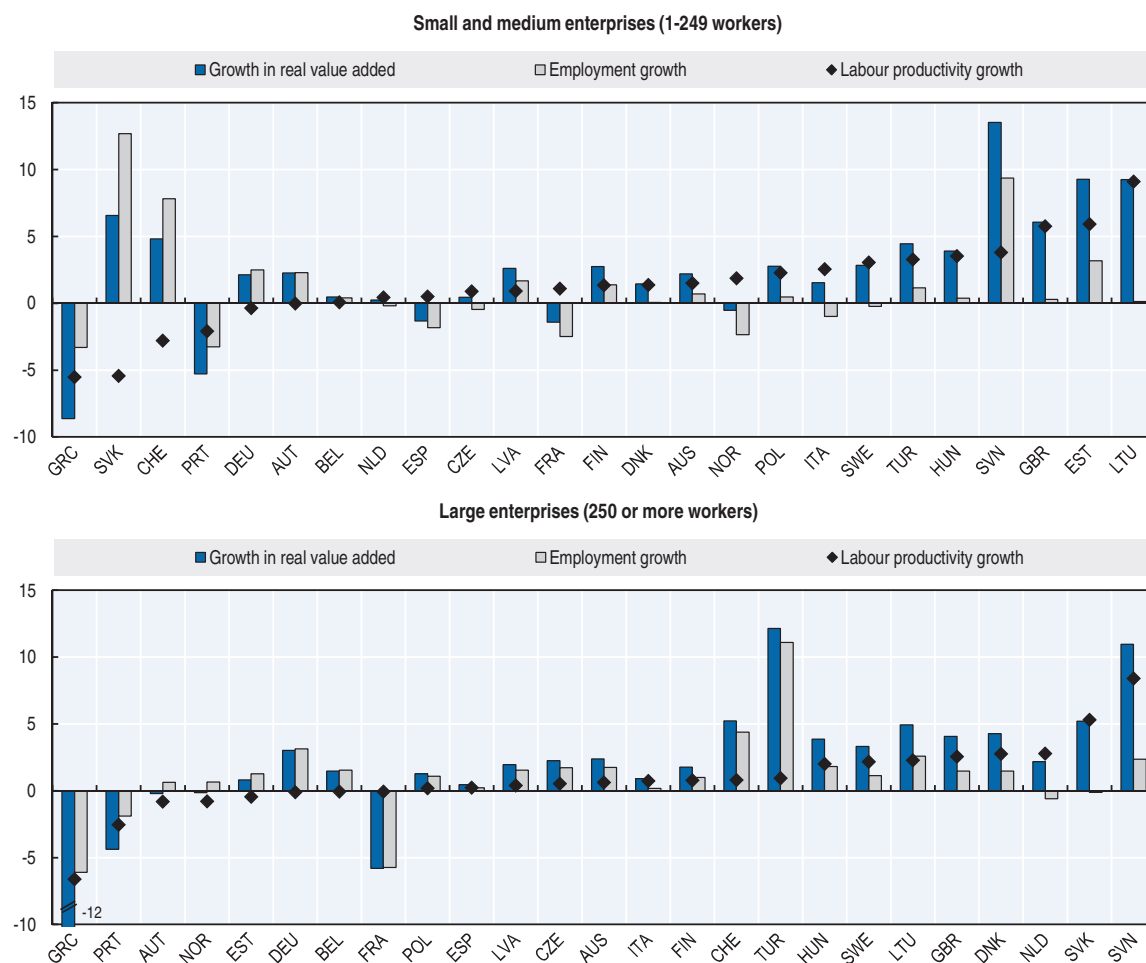
StatLink <http://dx.doi.org/10.1787/888933477411>

Figure 3.9. **Labour productivity growth by firm size, business services**
Real value added per person employed, average annual rate, percentage, 2009-14 or latest available year

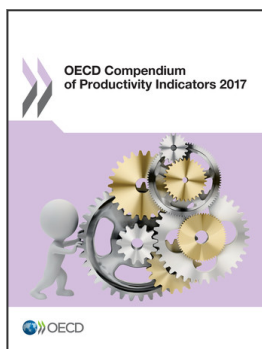


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Figure 3.10. **Growth in real value added and employment by firm size, business services**
Average annual rate, percentage, 2009-14 or latest available year



StatLink <http://dx.doi.org/10.1787/888933477438>



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