The Portuguese economy has improved substantially over the past few years, as it recovered from the Great Recession and is projected to continue expanding. Yet, despite an established economic upswing, subjective wellbeing is low and living standards remain modest compared with other OECD countries (OECD, 2019c). However, aggregate productivity growth has been disappointing over the past two decades, with a marked slowdown since the crisis. Real GDP per hour worked grew at a 0.02 percent rate annually over the period 2014-18, largely behind the OECD average rate of 0.9 percent or the Euro area average of 0.6 percent (OECD, 2019b). Stagnating productivity is particularly worrisome in Portugal, as the productivity gap vis-à-vis other OECD countries is already substantial (National Productivity Board, 2019). This issue of \textit{OECD Insights on Productivity and Business Dynamics} investigates within-industry productivity patterns. The analysis relies on data from the OECD MultiProd project to help understand the micro-drivers of aggregate productivity growth in Portugal (Box 1).

The micro-data confirms the economic upswing in Portugal, as within-industry productivity growth picked up after years of stagnation. However, it also shows that the productivity gap of Portuguese businesses relative to other OECD economies is particularly large for micro and small firms. This new evidence on the substantial productivity disadvantage of the smallest Portuguese firms complements findings from the OECD DynEmp project, which points to impediments to scaling up in the Portuguese economy (September issue in this series). Start-ups and young firms grow slower than in other OECD countries, and employment is concentrated in micro firms and SMEs (OECD, 2019d). Low-productivity firms (“laggards”) tend to be young and small (Berlingieri, Calligaris, Criscuolo and Verlhac, 2018). Their convergence could contribute to inclusive growth and wellbeing, as evidence from the MultiProd data also shows a tight link between productivity and wages in the Portuguese economy.

\begin{itemize}
  \item Within-industry productivity growth picked up after 2012, in both manufacturing and services.
  \item The productivity gap of Portuguese firms vis-à-vis other OECD countries remains substantial, especially for small businesses.
  \item Productivity dispersion between the most productive Portuguese firms and laggards increased more than in the OECD on average, mostly due to the deteriorating performance of laggards.
  \item Better productivity performance at the firm level could yield a double dividend of higher income and higher aggregate productivity, as there is a tight link between wages and productivity.
\end{itemize}

Portugal needs to continue improving framework policies and institutional efficiency in order to promote productivity and accelerate convergence in living standards. Extensive reforms since the early 2000s enhanced competition and market selection, but there is room to do more (OECD, 2019c). The most recent OECD Productivity
Market Regulation indicators point to excessively high barriers in services and network sectors, especially professional services such as accountants and lawyers, as well as transport (OECD, 2018b). Suboptimal regulations in service industries weigh on productivity growth in the entire business sector, as they have both direct effects on productivity and indirect effects on downstream industries that use services as intermediate inputs to production (Conway and Nicoletti, 2006). Moreover, the OECD Insolvency indicators show that the personal cost to failed entrepreneurs is larger in Portugal than in most other OECD countries (OECD, 2018a), while judicial efficiency is relatively low (OECD, 2019c). Despite recent improvements, insolvency proceedings remain lengthy and costly, which can negatively affect credit market conditions and divert resources away from start-ups with growth potential (Adalet McGowan, Andrews and Millot, 2017). Finally, the corporate tax system contains size-contingent provisions, such as a reduced statutory rate for small firms, which may incentivise them to cap their growth (OECD, 2019c).

**Productivity gap**

Portuguese firms have a low level of productivity in comparison to other OECD countries. Labour productivity, defined as value added per worker, is relatively low across the entire firm size distribution, especially in the manufacturing sector. Moreover, the productivity gap relative to other OECD countries, defined here as the ratio between labour productivity in Portuguese firms and in a benchmark set of OECD countries, is substantially larger for small firms (Figure 1). While the average labour productivity level of large manufacturing firms amounts to about 55% of the average for benchmark countries, it drops to 25% for micro-firms. The service sector displays a slightly different pattern: the productivity gap of large firms relative to the benchmark countries is smaller than that of micro-firms, but larger than the gap of medium-sized firms.

**Figure 1. Average productivity by size class relative to the benchmark countries**

Manufacturing and non-financial market services
Portugal vs benchmark countries, 2004-15

Note: This figure reports the ratio of average labour productivity in Portugal to average labour productivity in the benchmark countries across firm size classes, with size measured by the number of workers. Industry SNA A38 data aggregated to macro-sectoral (manufacturing and non-financial market services) level using weighted means, and then averaged (unweighted) over time for each country. The benchmark is the median of country averages. See Box 1 for details.


This evidence is of concern, as small firms account for a relatively large share of employment in Portugal (OECD, 2019d). While the trend has been towards larger firms in most OECD countries, the number of small firms in Portugal has actually increased since the 1980s (Braginsky, Branstetter and Regateiro, 2011). Obstacles to productivity growth at the firm level include size-contingent provisions that may prevent scale-up dynamics. For example, there is a general exclusion from the labour code of businesses with fewer than ten workers (OECD, 2019d). Small and medium enterprises also benefit from a lower statutory corporate tax rate (OECD, 2019c). Disincentives to grow prevent firms from reaching their optimal size and exploit scale economies, and thus might weigh on productivity.

Portugal saw encouraging developments in legislation reforms promoting competition (National Productivity Board, 2019). Beyond this progress, further relaxing the regulations in some service sectors could augment Portugal’s productivity through the impact at the firm level. For example, various professional services are both strictly regulated and represented by the same professional association. Independent supervisory bodies could be
established, which would ensure that regulations are in the public interest and competition is promoted. Additionally, regulations in the transport sector reduce competition, particularly in the ports. Addressing this can promote competition and strengthen export performance (OECD, 2019c). Low productivity in Portugal also partly arises from the existence of old, inefficient businesses that survive due to weak market selection, referred to as “zombie firms” (Adalet McGowan, Andrews and Millot, 2017).

Box 1. The MultiProd project

The MultiProd project gathers new evidence on productivity patterns based on firm-level micro-data. It extends productivity analyses beyond aggregate industry performances and focuses on the underlying dynamics and developments within industries, therefore enriching the policy debate on productivity. For example, MultiProd offers new insights on the evolution of “inequality in corporate performance” (measured by productivity dispersion within industries), and its structural and policy drivers. The MultiProd database is representative of the entire population of firms and harmonised across countries and over time. Hence, it is suitable for international comparisons to a cross-country benchmark and provides policymakers with further insights into the relative strengths and weaknesses of the economy in terms of productivity.

The MultiProd projects relies on collaboration between the OECD and experts from National Statistical Offices within the MultiProd network. The data source for Portugal is the Integrated Business Accounts System (Sistema de Contas Integradas das Empresas) from Statistics Portugal (INE), and they cover the period 2004-15. The project utilises a distributed micro-data approach that respects the confidentiality of the underlying data sources. See Berlingieri et al. (2017) for a methodological presentation of the MultiProd project.

This note focuses on manufacturing and non-financial market services (“services” for brevity) in order to enhance cross-country comparability, even though MultiProd covers most sectors of the economy. Macro-sectors (“sectors” for brevity, i.e. manufacturing and non-financial market services) are defined according to a customised 7-sector aggregation of ISIC Rev.4/NACE Rev.2 industrial classification. Detailed industries (“industries” for brevity) follow the SNA A38 classification. Coke and refined petroleum and Real estate are excluded from the analysis. See Desnoyers-James, Calligaris and Calvino (2019) for details on industry coverage and classification.

As of September 2019, the benchmark group for Portugal comprises Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Luxembourg, Japan, the Netherlands, New Zealand, Norway, Portugal, Sweden, and Switzerland. Figures do not include benchmark statistics after 2012 due to limited data availability.

Productivity growth

With observed aggregate labour productivity at a relatively low level in Portugal, an important consideration is the slowdown in productivity growth, a common trend in many OECD and non-member countries. Over the past two decades, Portugal’s growth in aggregate labour productivity has slowed (OECD, 2019b). This note goes beyond the aggregate and looks at productivity within industries. The micro-data suggests that there is ample room for productivity improvement in Portugal. Average labour productivity grew less compared to other OECD countries, in both manufacturing and market services (Figure 2). The cumulative change in average productivity within each industry in Portugal since 2004 is significantly lower than in other OECD countries. In manufacturing, within-industry labour productivity growth was less than ½ percentage point a year in Portugal, versus about 1½ percentage point in the benchmark of other OECD countries. The double-dip decline in firm-level productivity in 2008 and 2011-12 likely reflects the business cycle, namely the Great Recession and the Euro crisis. In the services sector, within-industry productivity declined over the period, while it stagnated in the benchmark.¹

Public expenditure on research and development can support innovative capacity and favour the productivity growth of frontier firms. In Portugal, most research and development support consists in tax credit provisions to the corporate income tax system (OECD, 2019c). They typically favour less dynamic incumbents over young innovative businesses because the present value of the subsidy increases with profitability (OECD, 2015). While the Portuguese government has extended the carry-forward period for small and medium firms, further reforms could include provisions that allow cash refunds for loss making firms, or exemptions from withholding payroll taxes for labour inputs related to research and development. Moreover, the adoption of digital technologies enhances the efficiency
of business processes productivity. Portuguese firms lag behind in terms of adoption of information and communication technologies, especially the ones that are well-suited to small firms such as cloud computing (OECD, 2017). Public support could focus on subsidizing the cost of cloud computing and other efficiency-enhancing technologies.

Figure 2. Cumulative change in within-industry labour productivity
Manufacturing and non-financial market services
Portugal vs benchmark countries, 2004-15

Note: This figure reports the estimated year dummies of a panel-data regression of average log labour productivity within industries in Portugal, and within country-industry pairs in a set of benchmark countries, taking the first base year as the baseline. Results estimated separately for manufacturing and non-financial market services based on SNA A38 industry classification. See Box 1 for details.


Productivity dispersion

Across many countries, there is heterogeneity in productivity between firms, even within narrowly defined industries. Moreover, productivity dispersion—usually measured by 90-10 productivity ratio, which compares the productivity level at the 90th percentile of the distribution (“the top”) to the productivity level at the 10th percentile (“the bottom”)—increased across OECD countries since the early 2000s, even within country-industry pairs (Andrews, Criscuolo and Gal, 2016; Berlingieri, Blanchenay and Criscuolo, 2017).²

Figure 3. Cumulative change in within-industry labour productivity dispersion
Manufacturing and non-financial market services
Portugal vs benchmark countries, 2004-15

Note: This figure reports the estimated year dummies of a panel-data regression of log labour productivity dispersion within industries in Portugal, and within country-industry pairs in a set of benchmark countries, taking the first base year as the baseline. Dispersion measured as the ratio of the 90th percentile to the 10th percentile of the labour productivity distribution. Results estimated separately for manufacturing and non-financial market services based on detailed industries, following the SNA A38 classification. See Box 1 for details.

Portugal experienced an increase in labour productivity dispersion significantly greater than that of other OECD countries (Figure 3). While within-industry productivity dispersion in manufacturing industries increased by 1% a year on average in the benchmark countries, it increased by more than 2% a year in Portugal. The pattern is similar in services, with a significantly larger increase in dispersion in Portugal than in the benchmark countries. In terms of level, dispersion is greater in certain industries. These include computer, electronic and optical manufacturing industry, the coke and refined petroleum industry, the chemical industry and the pharmaceutical industry (National Productivity Board, 2019).

In principle, the rise in productivity dispersion can come from (i) increasingly good performance at the top, due e.g. to augmented knowledge and technology adoption, or (ii) worsening performance at the bottom, due e.g. to the weakening of technology diffusion. In Portugal, the data suggest that the increase in dispersion mostly came from the deteriorating performance of firms at the bottom of the distribution, in both manufacturing and services (Figure 4). Yet, even though the productivity performance of the least productive firms worsened markedly relative to the median in Portugal, the group of laggard firms does not necessarily include only zombies and other businesses that survive due to weak market selection. Some of these laggards are typically young, small firms with high productivity growth potential but operating below optimal scale (Berlingieri et al., 2018).

Figure 4. Cumulative change in labour productivity at different parts of the distribution
Manufacturing and non-financial market services
Portugal vs benchmark countries, 2004-15

Note: This figure reports the estimated year dummies of a panel-data regression of average log labour productivity within industries at the 90th percentile (“top”), the 50th percentile (“median”) and the 10th percentile (“bottom”) of the labour productivity distribution in Portugal, and within country-industry pairs in a set of benchmark countries, taking the first base year as the baseline. Results estimated separately for manufacturing and non-financial market services based on detailed industries, following the SNA A38 classification. See Box 1 for details.


To foster aggregate productivity growth, Portugal could therefore implement policies that accelerate the catch-up of laggard firms. Recent OECD work suggests that public spending on training and research and development accelerate the convergence of laggards by easing the diffusion of knowledge and reducing the cost of technology adoption (OECD, 2019a). Reforms in Portugal that focused on upgrading job seekers’ skills should be continued and expanded, including the “Apprendizagem” and “Cursos de Educação e Formação de Adultos” vocational training programmes aimed at providing technological education (OECD, 2019c). Public spending on institutional training is particularly adapted to improve the productivity growth of small laggard firms, as they lack the resources to organise in-house training and have to rely on outside training institutions. For example, in Belgium, policy simulations suggest that raising public expenditure on institutional training to the average level observed in other European OECD countries could speed the catch-up of laggards by 7-8% (OECD, 2019a). Finally, addressing the “zombie firms” issue in Portugal could free up labour and capital resources that are sunk away from productive firms (Adalet McGowan, Andrews and Millot, 2017).
Productivity and wages

Recent OECD work shows the existence of a strong correlation between wages and productivity within industries (Berlingieri, Calligaris and Criscuolo, 2018). The micro-data confirms this existence of a wage-productivity premium in the case of Portugal, comparable to the benchmark of other OECD countries (Figure 5). Given the relationship with wage, policies that augment labour productivity of laggard firms could bring a double dividend of both improving aggregate productivity and sharing productivity gains more broadly through higher labour earnings for workers employed at laggards.  

Figure 5. Average wage by labour productivity quantile relative to the top decile
Manufacturing and non-financial market services
Portugal vs benchmark countries, 2004-15

Note: This figure reports average wages across productivity quantiles (bottom decile; 10th to 40th percentiles; 40th to 60th percentiles; 60th to 90th percentiles; top decile) relative to average wages in the top decile in Portugal and in the benchmark countries. Industry SNA A38 data aggregated to macro-sectoral level (manufacturing and non-financial market services) using weighted means, and then averaged (unweighted) over time for each country. The benchmark is the median of country averages. See Box 1 for details.


Notes

1 Investment also fell over the period, reducing the level of capital stock per worker (OECD, 2019c). Nevertheless, the MultiProd data shows that within-industry trends in multifactor productivity are similar to labour productivity trends.

2 The 90-10 productivity ratio is an intuitive measure of the spread of the productivity distribution. It is defined as the ratio between the 90th and the 10th percentile of the productivity distribution. A ratio of X is interpreted as follows: firms at the top of the productivity distribution, proxied by firms at the 90th percentile, are X times as productive as firms at the 10th percentile.

3 Policymakers will also need to reflect on the reduction in the labour share in Portugal, as real wage growth has been lower than productivity growth (National Productivity Board, 2019).
References


The global productivity slowdown and the simultaneous decline in business dynamism has prompted widespread policy concern. Productivity is the ultimate driver of living standards improvements in the long run, whereas a dynamic business environment is key in enabling job creation. Persisting negative trends can increase earnings inequalities and exacerbate pressures on governments’ budgets, thus threatening social cohesion and political stability.

While most existing analysis of productivity and business dynamics rely on macro-aggregated data, the OECD MultiProd and DynEmp projects utilise a distributed microdata methodology to construct unique sets of harmonised micro-aggregated statistics from confidential firm-level data. The resulting databases allow studying the role of individual firms in driving aggregate outcomes and explaining the observed macro trends across countries and over time.

OECD Insights on Productivity and Business Dynamics is a series of country profiles with a focus on the micro-drivers of aggregate productivity and job creation. It makes available, to wider audiences, analytical material from the MultiProd and DynEmp databases that was prepared for use within the OECD.

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