

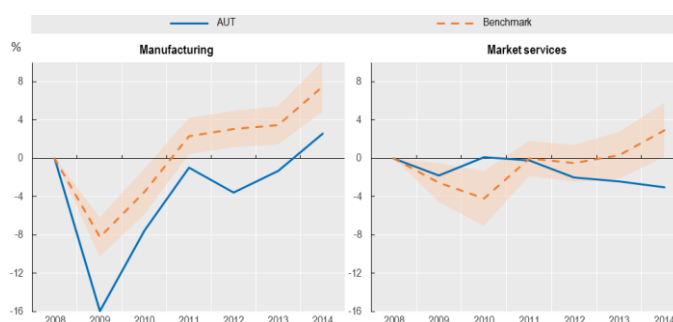
## Austria

In recent years, productivity growth has been disappointing in many countries. Given the importance of productivity for societies, this poor productivity performance has prompted widespread policy concerns about the possibility of a global and persistent productivity slowdown. Economic theory of long-term growth indeed shows that productivity is the key driver of increasing prosperity of nations. Conversely, persistently weak productivity growth can be a threat, with possible harmful consequences for social cohesion and political stability. The importance of productivity growth is even more relevant in ageing societies where it could help to accommodate the impact of demographic pressures on public budgets.

Austria's productivity growth over the 2000s has been slow compared to previous decades. Over the 2010-2016 period, it has been lower than the EU28, Euro area and OECD averages (OECD, 2018). This country profile focuses on the developments of productivity and wages within industries. Evidence based on firm level data shows that the average industry in Austria has experienced negative productivity growth over the period 2008-2014, and that productivity growth has been lower than in the comparison group of countries (Figure 1).<sup>1</sup> The overall trend is mostly driven by stagnating and decreasing productivity in non-financial market services, while productivity in manufacturing fell sharply during the crisis but recovered afterwards. Within industries, the disappointing growth performance is driven mostly by the most productive firms, that grow at consistently lower rates than the median and least productive firms throughout the observation period especially in the manufacturing sector.

**Figure 1:** Cumulative change in labour productivity  
Austria and benchmark countries 2008-14

Manufacturing and non-financial market services



*Note:* This figure reports the estimated year dummies of a panel-data regression of average log labour productivity within industries in Austria and within country-industry pairs in a set of benchmark countries (see notes of Figure 2), taking the first year as baseline.

*Source:* MultiProd database, February 2019.

### Highlights

- Labour productivity within the Austrian manufacturing sector grew moderately over the period from 2008 to 2014, but experienced a drastic decline in 2009 during the financial crisis. The service sector initially displays stagnating and later declining labour productivity over the same period.
- The dispersion of productivity and wage within industries declines in both manufacturing and non-financial market services, in contrast to an increase in dispersion observed in most countries in the comparison group.
- Productivity and wages increase with firm size in the Austrian manufacturing sector, while this link is much weaker in non-financial market services.

<sup>1</sup> Data in this document are limited to firms with at least ten persons engaged. While firms below this size threshold are in general included in the underlying data source used for the analysis for MultiProd, these firms are not randomly sampled in Austria, but only included if they exceed a revenue threshold. This implies that the only small firms (i.e. with less than 10 employees) that are included in the data are on average more productive since they have revenues larger than the threshold. Re-weighting the sample would therefore not make it representative of the whole population.





## Country background

Austria enjoys a high quality of life, high GDP per capita and an employment rate that exceeds the OECD average (OECD, 2017). The risk of long term-unemployment and labour market insecurity are low. During the financial crisis, the Austrian government provided extensive short-time work benefits and other policy programs to alleviate the employment effects of the crisis (Böheim, 2017). Wage inequalities and poverty compare favourably to other countries, thanks to a tax and transfer system that curbs market income inequality by nearly half. Concerning productivity levels, Austria ranks among the highest in the OECD (OECD, 2018). Yet, productivity growth has been slowing down as in other advanced economies. Factors such as population ageing, a lack of digital skills, and slow adoption rates of innovative information and communications technologies pose challenges to the Austrian economy. The Austrian government has presented a “Digital Roadmap” in 2017 as a first step to address these challenges.

## Productivity trends over time

As the main driver of long-term economic growth, productivity is eminently important for increasing standards of living and well-being. Thus, new evidence is given on the evolution of productivity over time for Austria in a comparative setting with respect to a reference group of countries, the “benchmark”. The analysis will focus on labour productivity, defined as value added per worker.

The country profile takes advantage of the unique and detailed information that the OECD has collected thanks to the MultiProd project (Box 1). This includes detailed information on productivity differences within narrowly defined industries and thus allows for a comparative analysis of the micro drivers of productivity growth. The analysis extends the research on the implications of structural change for the Austrian economy, i.e. a sectoral reallocation reflecting the decline of agriculture and the parallel growth of finance and business services, which contributed to an increase in aggregate labour productivity growth (Schneider, 2014). The country profile focuses on the development of productivity and wage dispersion within industries. The evidence presented highlights that Austria, which displays one of the lowest levels of income inequality in the EU (European Commission, 2017), has also experienced decreasing trends in dispersion of both productivity and wages, at odds with the benchmark countries.

### Box 1: The MultiProd project

The MultiProd project contributes to the analysis of productivity by offering new evidence based on firm-level data. This enriches the policy debate on productivity by extending the analysis beyond aggregate industry performance to the important underlying dynamics and developments within industries. Thanks to information at the level of businesses, this new data source offers, for example, new insights on productivity dispersion within industries, its evolution over time and its structural and policy drivers. Policy makers can gain further insights from these measures of “inequality in firm performance” by means of an international comparison owing to the collection of harmonised, and therefore comparable, data. Each country can be then compared to a cross-country benchmark, which sheds light on the strengths and weaknesses of the economy in terms of productivity.

The MultiProd database generally covers most sectors of the economy, but in order to enhance cross-country comparability the country profile focuses on manufacturing and non-financial market services (or “services” for brevity). Coke and refined petroleum, and Real estate are excluded from the analysis. Macro-sectors, i.e. manufacturing and non-financial market services, for brevity also referred to as “sectors” in the document, are defined according to a customised 7-sector aggregation of ISIC Rev.4/NACE Rev.2 industries. Detailed industries follow the SNA A38 classification, for brevity also referred to as “industries” in the document.\* Only the countries providing separate information on firms with at least ten employees are included in the benchmark group for Austria; as of February 2019, they are: Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, and Switzerland. Due to limited data availability in more recent years, the set of benchmark countries is more limited after 2012: Austria, Belgium, Chile, Finland (until 2013), France, Germany (until 2013), Ireland, Italy, Japan, and the Netherlands. The data source for Austria is the “Leistungs- und Strukturstatistik” (Structural Business Statistics) from Statistics Austria. See Berlingieri, Blanchenay, Calligaris and Criscuolo (2017) for a more detailed presentation of the methodology used in the MultiProd project, and Desnoyers-James, Calligaris and Calvino (2019) for more details on industry coverage and classifications.

\* For a summary of Eurostat Nace Rev.2 aggregations, see OECD (2012), [OECD STAN industry list](#).







Figure 1 reports average productivity trends in Austria for both manufacturing and non-financial market services. The figure presents the average cumulative change in productivity since 2008 within each industry in Austria, and compares it against the average across each of the benchmark countries. Although changes in the sectoral composition of the economy played a role in the evolution of aggregate productivity in Austria in the past two decades (Schneider, 2014), the methodology adopted here takes advantage of the richness of the MultiProd data to focus on the micro drivers of productivity growth and productivity dispersion within industries and ignores the role of any sectoral or industrial compositional effect (see Box 1 for the definition of sectors and industries).

Figure 1 shows that, during the global financial crisis from 2008 to 2009, labour productivity declined more drastically in the average Austrian manufacturing industry compared to the benchmark countries. The severity of the decline in manufacturing labour productivity during the crisis may, at least partly, reflect policies that helped mitigate the employment impact of the crisis. Measures such as public income support to workers who worked fewer hours may have indeed encouraged labour hoarding by firms during the crisis (Hofer, Weber and Winter-Ebmer, 2013). From 2010 onwards, labour productivity growth in Austrian manufacturing recovered and almost caught up to the benchmark countries by 2014. However, the overall cumulative growth over the period was barely positive and remained significantly lower than in the benchmark countries.

The service sector displays a different pattern. The decline in labour productivity in 2009 and 2010 is less pronounced than in manufacturing and in line with the trend in benchmark countries. The short-time working arrangements during the crisis were used to a much lesser extent in services than in manufacturing, which could explain why productivity in services did not fall as much as in manufacturing (Walz et al., 2012).<sup>2</sup> Austria displays negative overall growth in labour productivity over the observation period, which may be due to an environment of restrictive regulation and slow technology adoption in the Austrian service sector (European Commission, 2018).

## Productivity and wages

Given the existence of large and persistent differences in productivity between firms, even within narrowly defined industries, the previous insights on the evolution of productivity are now complemented by an analysis of within-industry productivity dispersion over time. The analysis will thus focus on differences in performance between firms with various level of productivity, e.g. between best performing firms and those that perform the worst. In doing so, it provides a more complete picture of the evolution of productivity in Austria, helping policy makers to measure and understand the forces that drive such economic disparities across firms and underlie aggregate productivity growth, in order to design better policy responses to the challenges that Austria is facing.

Furthermore, new evidence on wage inequality, which increased for a multitude of countries over the past decades, is also presented. In a time of growing concerns for inclusive economic growth, the widespread increase in income inequalities is a source of concerns that policy makers may want to address. Wage inequality is a significant driver of overall inequalities, and empirical evidence demonstrates that it may be attributed to a rise in wage dispersion between firms. Berlingieri, Blanchenay and Criscuolo (2017) relate the increase in wage dispersion to an increase in pay differences between the most and least productive firms, even within narrowly defined industries. Berlingieri, Calligaris and Criscuolo (2018a,b) explore also the role of firm size, measured as number of persons working at the firm, in explaining productivity and wage differences across firms. Interestingly, their analysis suggest that, while in the manufacturing sector SMEs have significantly lower productivity and wages than their larger counterparts, this is not so clear-cut in services. In services, a larger firm workforce is therefore not necessarily synonymous with higher productivity and higher wages, especially when looking at the difference between medium-sized and large firms. This country profile helps to compare trends in Austria to global trends for both productivity and wage dispersion. It also looks at how SMEs perform vis-à-vis larger businesses in terms of productivity and wages to provide policy makers with the evidence needed to design informed economic policies.

## Dispersion of productivity and wages within industries

Figure 2 reports the average cumulative change in the dispersion of labour productivity and wages within each industry in Austria, and compares it against the average across each of the benchmark countries. Dispersion is

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<sup>2</sup> 87.1% of employees receiving short-time working benefits were employed in the manufacturing sector, while services accounted for less than 5% (Bock-Schappelwein, Mahringer and Rückert, 2011).







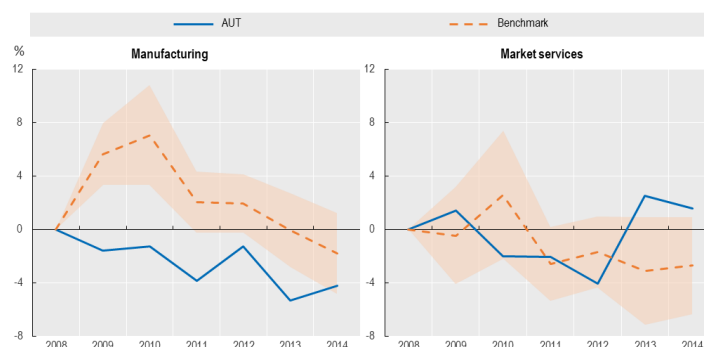
measured as the gap in productivity (wages) between the best and worst performing (paying) firms, defined as firms in the top and bottom 10% in terms of performance (wages) in a particular industry in each year.<sup>3</sup>

Concerning dispersion of labour productivity in the manufacturing sector, Austria is in line with the benchmark countries with respect to the overall cumulative change over the period, but present different dynamics (Panel (a) of Figure 2). While the benchmark countries experienced an initial increase in labour productivity dispersion picking up in 2010, Austria displays a pattern of decreasing dispersion over the entire period. In services, the difference between Austria and the benchmark is less pronounced: productivity dispersion in Austria exhibits a slightly stronger decrease until 2012, before picking up in the last two years and displaying an overall change over the period that is significantly higher than in the benchmark.

Panel (b) of Figure 2 analyses the growth differential between wages in the highest paying firms and those in the worst paying firms. In both sectors, the figure confirms the pattern of declining dispersion in wages already observed for productivity, pointing to a tight link between trends in productivity and wages in Austria. This is in line with the positive relationship between productivity dispersion and wage dispersion found in Berlingieri, Blanchenay and Criscuolo (2017) and with the tight link between wages and productivity found in Berlingieri, Calligaris and Criscuolo (2018a,b). Austrian wage dispersion decreased more strongly in the beginning of the observation period than the benchmark, with the benchmarking catching up in later years.<sup>4</sup> Given that changes in wage dispersion between firms are a key driver of the evolution of overall wage inequality, this observation provides encouraging news for a further decrease of inequality in Austria, which is already among the lowest in Europe and OECD countries (European Commission, 2017 and OECD, 2019). The low level of dispersion in Austria is further underlined by Figure 3, which reports the average dispersion within industries in labour productivity over the observation period in Austria and compares it against the average across each of the benchmark countries. The average dispersion over time is lower in Austria than in the benchmark countries in all analysed industries. However, two notes of cautions might qualify these results. First, the service sector shows signs of a reversal of the trend of decreasing dispersion from 2013 onwards, which brings it close to the average of benchmark countries. Second, since firms with less than ten persons engaged are excluded from the analysis in this country profile (see footnote 1), levels and changes in wage and productivity dispersions are likely to be underestimated both in Austria and in the benchmark countries.<sup>5</sup>

**Figure 2. Dispersion of productivity and wages**  
Manufacturing and non-financial market services  
Austria vs benchmark countries, 2008-14

(a) Cumulative change in labour productivity dispersion, within industries



<sup>3</sup> This document focuses on one measure of dispersion: the 90-10 productivity (wage) ratio is defined as the ratio between the 90<sup>th</sup> and the 10<sup>th</sup> percentile of the productivity (wage) distribution. It is used widely in both the inequality and the productivity literature to assess the spread of the distribution of wages and productivity. The measures are quite intuitive since a ratio of X can be interpreted as “firms at the top of the productivity (wage) distribution, proxied by firms at the 90<sup>th</sup> percentile, producing, given the same amount of inputs, (or paying) X times as much as firms at the 10<sup>th</sup> percentile”.

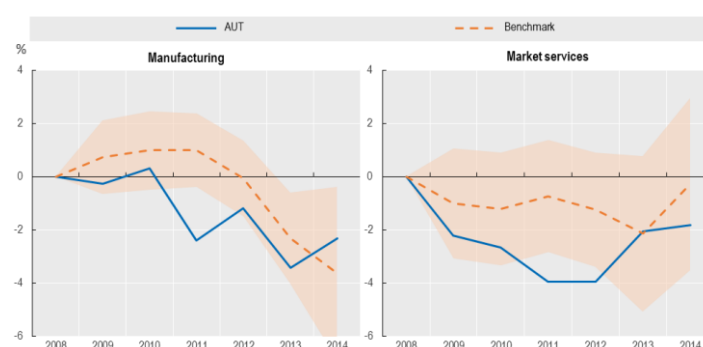
<sup>4</sup> The trends for the benchmark after 2012 have to be treated cautiously. The number of benchmark countries is reduced after 2012 (see Box 1), which may affect the trends in both productivity and wage dispersions due to a compositional effect.

<sup>5</sup> Note that while the 90-10 productivity and wage ratios are very likely to be underestimated (especially in manufacturing), changes in dispersion might not necessarily be as long as trends in firms with less than ten persons engaged are not systematically worse than in larger firms. However the empirical evidence points to an under-estimation of the increase in dispersion: the benchmark countries in fact display higher increases in dispersion when firms below ten employees are also included.





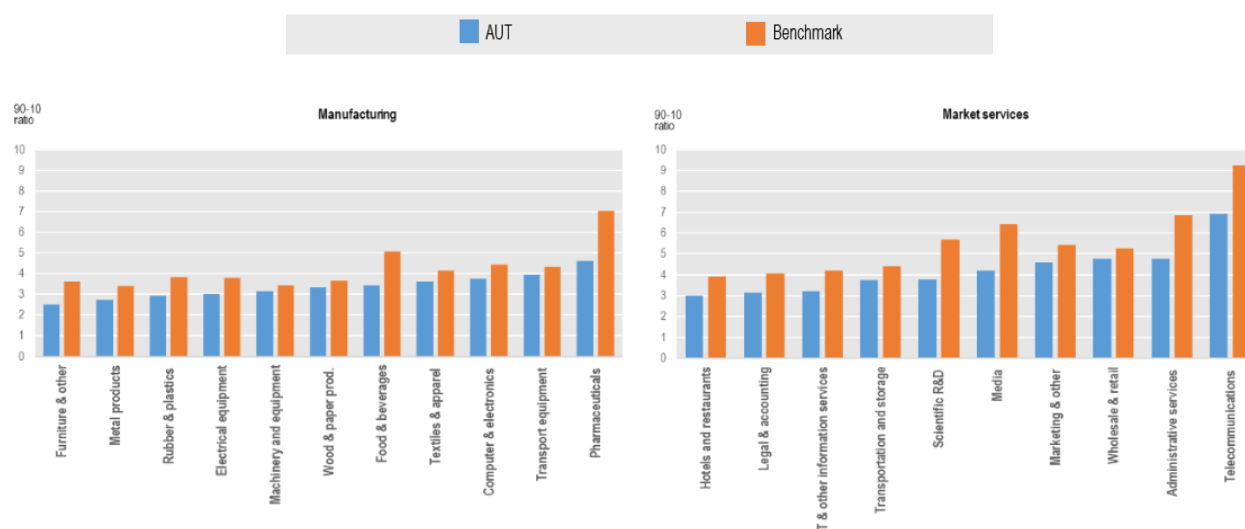
(b) Cumulative change in wage dispersion, within industries



Note: This figure reports the estimated year dummies of a regression of average log labour productivity and log wage dispersion within industries in Austria and within country-industry pairs in a set of benchmark countries, taking the first year as baseline. In the top (bottom) panel, dispersion is measured as the ratio of the 90<sup>th</sup> percentile to the 10<sup>th</sup> percentile of the firm-productivity (firm-wage) distribution. The values correspond to the average growth within country-industry since 2008. Results are estimated separately for manufacturing and non-financial market services based on detailed industries, following the SNA A38 classification (see Desnoyers-James, Calligaris and Calvino, 2019). Benchmark countries include Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Norway, Portugal, and Switzerland. The period considered is 2008-14.

Source: MultiProd database, February 2019.

**Figure 3. Average dispersion of productivity within industries**  
Manufacturing and non-financial market services  
Austria vs benchmark countries, 2008-14



Note: This figure reports the average dispersion in labour productivity within industries in Austria and within country-industry pairs in a set of benchmark countries. Dispersion is measured as the ratio of the 90<sup>th</sup> percentile to the 10<sup>th</sup> percentile of the firm-productivity distribution. Results are presented separately for manufacturing and non-financial market services based on detailed industries, following the SNA A38 classification (see Desnoyers-James, Calligaris and Calvino, 2019). Benchmark countries include Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Norway, Portugal, and Switzerland. The period considered is 2008-14.

Source: MultiProd database, February 2019.

## Productivity and wages for SMEs and large firms

The country profile now focuses on differences in productivity performance and wages for firms of different sizes across sectors, providing a better understanding of the repartition of gains associated to productivity growth.

In a cross-country analysis on 16 countries, Berlingieri, Calligaris and Criscuolo (2018a) find that the stylised fact that larger firms are on average more productive and pay higher wages, does not hold so clearly in market services, which are nowadays a dominant part of the economy. This finding implies that larger service firms are not necessarily more productive or pay higher wages, which may call for a reconsideration of applying the same size contingent





policies across all sectors of the economy, when size is measured by employment. In addition, if the most productive and highest paying firms in non-financial market services do not have as many employees as their counterparts in manufacturing; this implies that the benefits of high productivity growth may benefit a smaller share of the population in a service economy, posing a challenge for an inclusive model of growth. At the same time, more productive firms pay higher wages in both sectors, reinforcing the importance of policies aimed at improving technology diffusion and productivity for fostering inclusive growth.

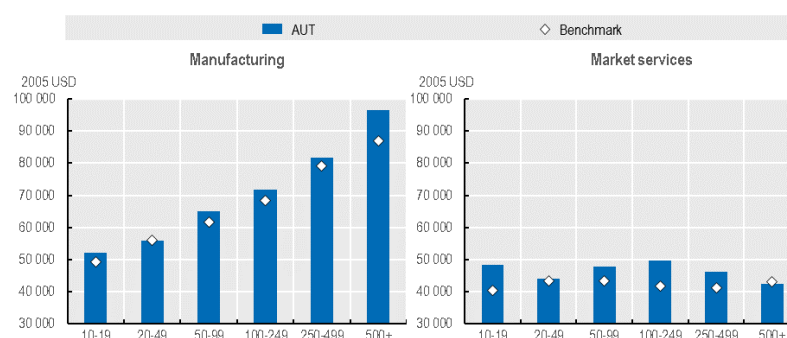
The evidence reported in Figure 4 confirms that these findings hold also for Austria. The figure reports (labour) productivity performance and average wages for SMEs and large firms in Austria and in the benchmark, classifying businesses in six size classes (10 to 19 workers; 20 to 49; 50 to 99; 100-249; 250-499; more than 500).

**Figure 4.** Average productivity and wage in different size classes

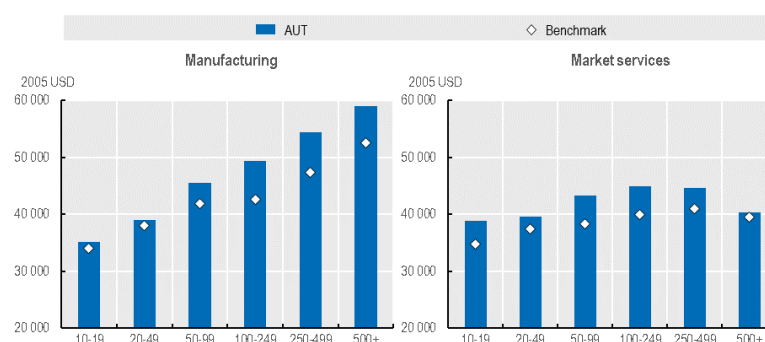
Manufacturing and non-financial market services

Austria vs benchmark countries, 2008-14

(a) Labour productivity



(b) Average wage



*Note:* This figure presents average labour productivity (top panel) and average wages (bottom panel) across six different firm size classes (10 to 19 workers; 20 to 49; 50 to 99; 100-249; 250-499; more than 500 persons engaged) in Austria and in the set of benchmark countries. Industrial (SNA A38) data are aggregated up to sectoral (manufacturing and non-financial market services) level using weighted means, and then averaged (unweighted) over time for each country. The benchmark represents the median of country averages. Benchmark countries include Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Norway, Portugal, and Switzerland. The period considered is 2008-14.

*Source:* MultiProd database, February 2019.

In each of the two panels in Figure 4 the increasing patterns of productivity and wages when going from the smallest to the largest firms in manufacturing contrast sharply with the much flatter productivity and wage pattern across size classes in the service sector. Vis-à-vis the benchmark, the Austrian manufacturing sector shows a sharper increase of wages with size, while productivity appears to be slightly higher across all size categories. In services, the patterns are less clear-cut but Austrian firms are on average more productive and pay higher wages than in the benchmark in all but the 20-49 and 500+ categories.<sup>6</sup>

<sup>6</sup> Higher productivity in the 10-19 category might partly be explained by some industries within the service sector where firms with 10-19 persons engaged are a sample and not the universe. However, as the revenue thresholds in these industries are relatively low and should be met by most firms with employment above 10 (for example 900,000€ in real estate services), the selection issue should affect only a low number of firms.







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