



In the new service economy, it is productivity not firm size that matters for wages

The evidence that bigger firms pay higher wages and have higher productivity is based mainly on manufacturing, which is only a small share of today's economy. **Giuseppe Berlingieri, Sara Calligaris and Chiara Criscuolo** reveal that while the size premia for both wages and productivity are significantly weaker in market services than in manufacturing, the link between wages and productivity is stronger.

Firm size, productivity and pay in today's service economy

The twentieth century was characterised by Fordism and large conglomerates, an era in which the traditional paradigm of bigger firms as the most productive and paying the highest wages would strongly hold. In this context, it should come as no surprise that the links between firm size, productivity and pay have been the subject of many economic studies, both from a theoretical and empirical point of view. The evidence typically indicates that:

- Workers at large employers get higher wages on average – the so-called 'size-wage premium' (Moore, 1911).
- Large employers are on average more productive than smaller ones – what we call the 'size-productivity premium'.

The majority of these studies focus exclusively on manufacturing in a single country; often because of lack of data, services are rarely analysed. But nowadays, with manufacturing only representing around 15% of total value added and employment in OECD economies (and decreasing), it is essential to understand whether the predicted relationships apply to the services sector.

In our research, we provide systematic cross-country evidence on the links between firm size, productivity and pay thanks to novel micro-aggregated firm-level data for the period 1994-2012 from 17 countries: Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Hungary, Italy, Japan, the Netherlands, Norway, Portugal, Sweden and Switzerland.

The dataset contains harmonised information on productivity, wages and firm size. In contrast with previous studies, our analysis:

- Uses data that are based either on the full population of firms in each country or a representative re-weighted sample based on information from business registers.
- Covers manufacturing and services in 25 countries.
- And measures wages, labour productivity and multi-factor productivity (MFP) across size classes (for details, see Berlingieri et al, 2017b).

Here we focus exclusively on the 17 countries listed above, for which information on firm size is available and for both manufacturing and non-financial market services.

A paradigm shift in today's service economy

The key fact unveiled in our study can be illustrated by simply plotting the (weighted) cross-country average of wages and labour productivity by eight size classes for manufacturing and market services separately.

Panels A and B of Figure 1 show that while in manufacturing both productivity and wages increase significantly with firm size, this relationship does not hold for services. Both labour productivity and wages exhibit a distribution over size classes that is flatter in services than

in manufacturing. At the same time, wages increase with productivity in both manufacturing and especially non-financial market services (see Panels C and D).

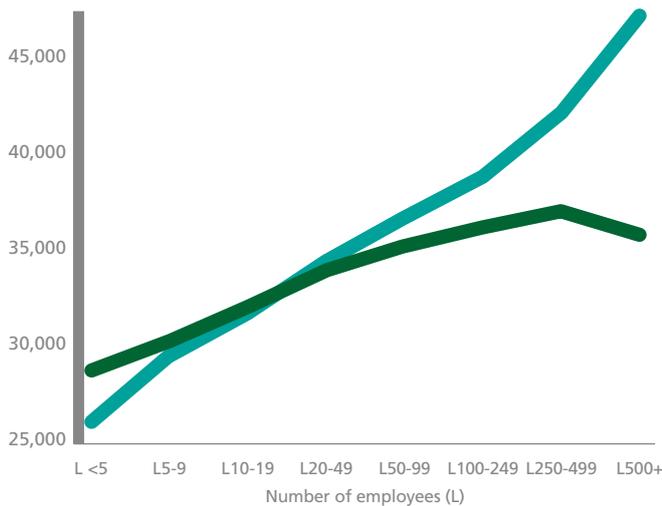
We investigate the links of productivity and wages with size by adopting an econometric strategy that focuses on these links within countries, two-digit industries and years. This strategy ensures that the relationships of wages and productivity with size at the macro-level are not driven by the sectoral specialisation of countries, aggregate time trends or any unobservable characteristic that varies at the country-industry-year level.

The most productive firms at the top are not necessarily the largest ones in terms of employment but they do pay the best

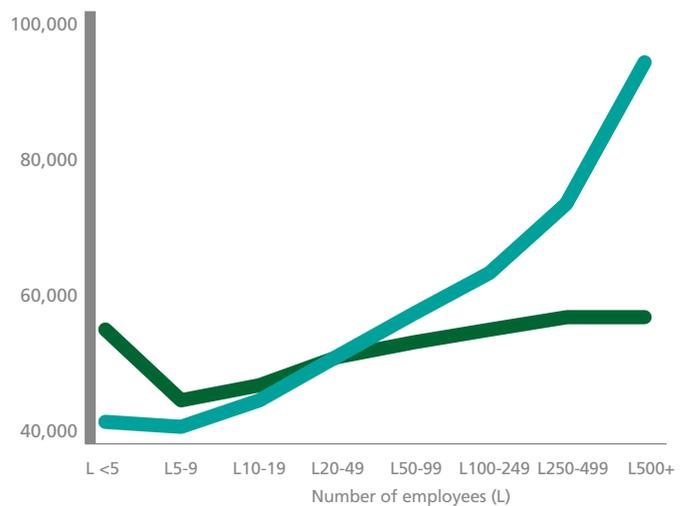
Figure 1: Averages by size classes and productivity quantiles

■ Manufacturing
■ Market services

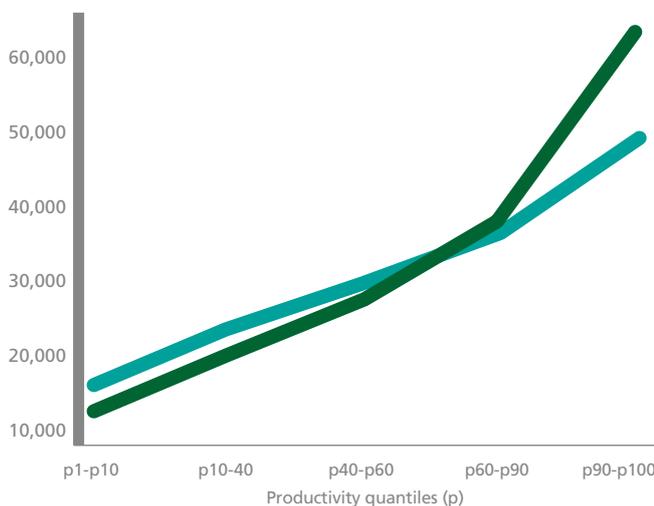
Panel A: Wages by size classes



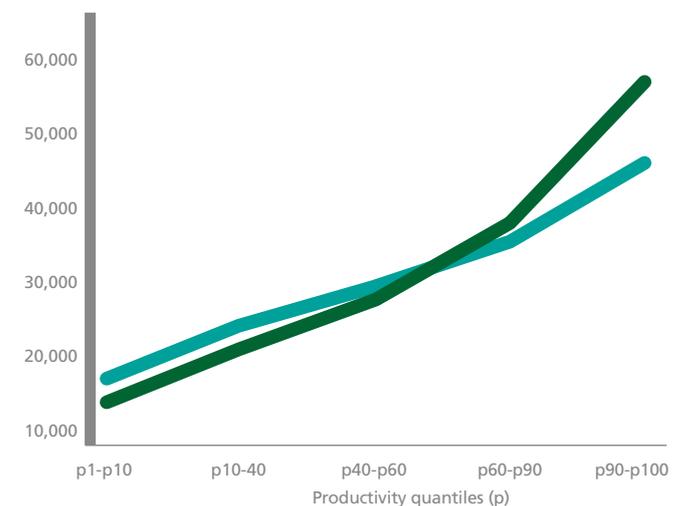
Panel B: Labour productivity by size classes



Panel C: Wages by labour productivity quantiles



Panel D: Wages by multi-factor productivity



We find that in line with previous research findings, both productivity and wages increase monotonically with firm size in manufacturing. Conversely, the distribution is much flatter in non-financial market services, where firms of more than 20 employees pay on average rather similar wages to their workers, and exhibit very similar productivity levels (both labour productivity and MFP). While on average small services firms pay higher wages and are more productive than their counterparts in the manufacturing sector, the opposite is true for large firms.

Given that the positive size-wage premium may, at least partly, reflect productivity differentials among firms of different sizes, we turn to investigating the direct link between wages and productivity. We ask ourselves whether wages respond more to firm productivity compared with size, and whether the relationship is similar across sectors. We find that wages increase with productivity and that the relationship is very tight both in manufacturing and even more so in services.

The combination of these results suggests that size does not 'mediate' the relationship between productivity and wages in the services sector. When looking at data going beyond manufacturing, the 'size-wage premium' becomes rather a 'productivity-wage premium'.

We go on to investigate whether existing explanations for the size premium can fully account for our findings. In particular, we control for firm age, capital intensity, skill and knowledge intensity, and industry concentration, allowing for a differential effect of these variables across size classes and industries.

As found in previous research, we confirm that these variables can explain some of the size premium found in manufacturing but they do not fully account for it. In addition, of particular importance for our focus, we find that they cannot fully explain the significant differential size premium between manufacturing and services.

Bringing inclusivity to productivity

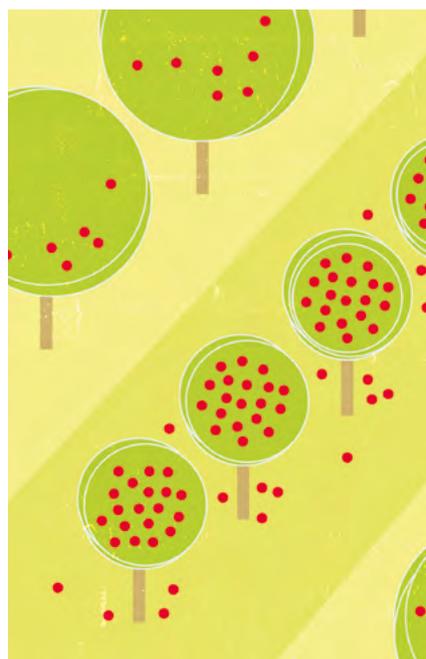
These results have first-order policy implications for both workers and firms.

The traditional paradigm of a manufacturing economy, in which the most productive firms were also the largest and therefore shared the benefits of their high

productivity with a very large number of workers, seems to have shifted in today's service economy.

Recent research has shown that there are large and growing productivity gaps between the most and the least productive firms, even within industries (Andrews et al, 2016; Berlingieri et al, 2017a). We add to this debate by showing that, contrary to the established size-wage premium, the most productive firms at the top are not necessarily the largest ones in terms of employment.

This fact increases the likelihood of productivity and wage gains being shared with fewer workers, which in turn increases concerns about the inclusivity of the growth model of the new service economy. Policy-makers might need to reflect on the potential implications that these trends have for perceived and measured inequality.



The likelihood of productivity and wage gains being shared with fewer workers is a challenge to achieving inclusive growth in today's service economy

This article summarises 'The Productivity-Wage Premium: Does Size Still Matter in a Service Economy?' by Giuseppe Berlingieri, Sara Calligaris and Chiara Criscuolo, CEP Discussion Paper No. 1557 (<http://cep.lse.ac.uk/pubs/download/dp1557.pdf>), a shorter version of which is published in *AEA Papers and Proceedings* 108: 328-33.

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Further reading

Dan Andrews, Chiara Criscuolo and Peter Gal (2016) 'The Best versus the Rest: The Global Productivity Slowdown, Divergence across Firms and the Role of Public Policy', OECD Productivity Working Papers No. 5.

Giuseppe Berlingieri, Patrick Blanchenay and Chiara Criscuolo (2017a) 'The Great Divergence(s)', CEP Discussion Paper No. 1488 (<http://cep.lse.ac.uk/pubs/download/dp1488.pdf>), summarised in 'The Growing Inequality between Firms', *CentrePiece* 22(3), Autumn 2017 (<http://cep.lse.ac.uk/pubs/download/cp511.pdf>).

Giuseppe Berlingieri, Patrick Blanchenay, Sara Calligaris and Chiara Criscuolo (2017b) 'The MultiProd Project: A Comprehensive Overview', OECD Science, Technology and Industry Working Paper No. 2017/04.

Nicholas Bloom, Fatih Guvenen, Benjamin Smith, Jae Song and Till von Wachter (2018) 'The Disappearing Large-Firm Wage Premium', *AEA Papers and Proceedings* 108: 317-22.

Henry Ludwell Moore (1911) *Laws of Wages: An Essay in Statistical Economics*, Macmillan Company.