

Many blame globalisation for growing wage inequality in the UK. But according to research by **Giulia Faggio, Kjell Salvanes** and **John Van Reenen**, the rise in inequality is better explained by increasing dispersion in the productivity of firms related to their use of new technology.

Inequality of individual wages and the dispersion of firm productivity

Wage inequality has increased substantially in both the United States and the UK in the last 30 years. This fact, which is now firmly established, has fuelled debate about appropriate policy responses, including more progressive taxation, education and training, tougher corporate governance to control the remuneration of top management, strengthening unions and minimum wages, curtailing trade and beefing up social security. Some critics of pro-market reforms claim that rising inequality is evidence that liberalisation helps the rich at the expense of the average worker. For others, rising inequality is used to argue for programmes to upgrade skills.

But a proper policy response requires an understanding of what has caused wage inequality. Much research shows (see, for example, the summary in Machin

and Van Reenen, 2007) that an important part of the rise in inequality comes from increases in inequality among similar workers – what economists call ‘within-group’ inequality. This means that workers with a similar age, gender, skill and industry group tend to be paid increasingly dissimilar wages.

Within-group inequality may be driven by the same factors explaining the broader distribution of wages between workers. For example, if technology increases the payoff to a university education it is also more likely to increase the wages of more able graduates more than those of less able graduates. But the increase in within-group inequality may be driven by other factors – such as declining union membership and the minimum wage (Goldin and Katz, 2007).

Technology-based theories of within-group wage inequality share a common prediction: since workers’ pay is linked to

their productivity, increases in wage inequality should be accompanied by increases in ‘productivity dispersion’. In other words, the productivity distribution for firms should have widened.

Our new study looks first at individuals’ earnings and firms’ average wages and shows that the increase in wage dispersion between people is mainly due to an increase in wage inequality between firms. In other words, the internal structure of wages within firms has not widened as much as the difference in average wages between firms (in the same industries). This is an important finding when looking for the causes of wage inequality. It suggests that little of the growth in inequality is the result of changes in the way firms treat their own workers.

Hundreds of papers have documented a close correlation between firms’ average wages and firms’ average productivity

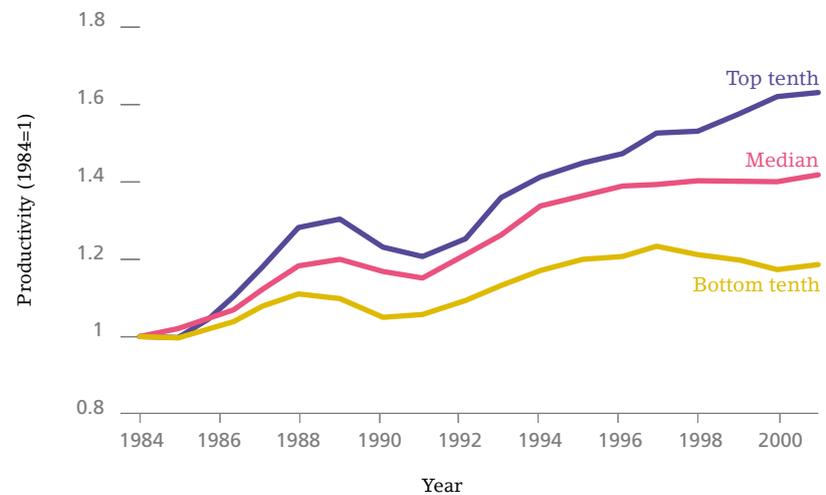
beginning with the pioneering work of ex-Monetary Policy Committee members Sushil Wadhvani and Steve Nickell in the 1980s at the CEP (see, for example, the summary in Layard et al, 2005). We also find that this relationship persists and has grown stronger, suggesting that firms' characteristics are important in understanding the evolution of wage inequality.

To test the link between productivity and inequality, our research looks at changes in firm productivity, mainly measured by value added per worker, over time. We focus on the differences between high- and low-productivity firms among representative samples of hundreds of thousands of British firms.

Previous research has studied the manufacturing sector (Dunne et al, 2004; Haskel and Martin, 2002), but we analyse both the manufacturing and service sectors of the UK economy since the two sectors have experienced very different trends. In particular, the manufacturing sector has been in rapid decline, which means that the least productive firms are disappearing from view, compressing the observed distribution. Consistent with this fact, productivity inequality has risen much faster in services than in the manufacturing sector since the early 1980s.

It is well-known and entirely understandable that different firms have

Figure 1:
Productivity dispersion in the UK economy, 1984-2001



Note: Productivity is defined as the log of value added per worker. Values are indexed to be 1 in 1984, so the lines show the growth in productivity at different parts of the distribution. The upper line is at the 90th percentile, the middle line is the median and the bottom line is at the 10th percentile.

Much of the rise in wage inequality is driven by increasing differences in wages among firms in the same industry



different productivity levels. Some firms are better managed and use better technology than other firms. But an original finding of our work is that this productivity gap between firms has widened. We look at two groups of firms from opposite ends of the productivity distribution: one at the top (90th percentile) and one at the bottom (10th percentile).

So productivity inequality rose substantially over the period (see Figure 1). Between 1984 and 2001, productivity in our sample rose by about 49% (40 log points) for the median firm. But for firms near the bottom (the 10th percentile) there was a rise in productivity of only 22% (20 log points) whereas for firms near the top (90th percentile) productivity has risen by about 82% (60 log points).

Our research shows that changes in labour productivity are mainly driven by changes in 'total factor productivity', rather than changes in the amount of buildings or old capital equipment used. These results suggest that technological differences among firms may be the underlying cause of increasing dispersion. Using data on the use of information and communication technologies (ICT), we show that productivity dispersion rose most strongly in sectors where ICT use grew most rapidly and intensively. The rise in productivity dispersion did not seem closely related to imports or to trade unions.

Finally, we also document a rise in productivity dispersion in France and Norway in the 1990s, although the rise was smaller than in the UK. Such

comparisons are useful because when 'general-purpose technologies' such as ICT become ubiquitous, the impact on firms is felt worldwide. Cross-country comparisons make it possible to distinguish general effects from changes specific to the UK.

In terms of policy, our findings suggest that the causes of rising inequality are primarily structural and related to new technology rather than to trade or institutions. Thus, contrary to what some have argued, greater trade protectionism or the re-energising of unions may do relatively little to reverse the increase in inequality.

A better strategy would be to concentrate on raising the skill and education levels of the workforce, particularly of those at the bottom of the ability distribution. This means not just improving the quantity of schooling for disadvantaged groups, but increasing the quality of school and pre-school education.

The increase in the productivity dispersion of firms is mainly in services, especially in sectors where ICT use grew most rapidly and intensively

This article summarises 'The Evolution of Inequality in Productivity and Wages: Panel Data Evidence' by Giulia Faggio, Kjell Salvanes and John Van Reenen, CEP Discussion Paper No. 821 (<http://cep.lse.ac.uk/pubs/download/dp0821.pdf>).

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Further reading

Timothy Dunne, Lucia Foster, John Haltiwanger and Kenneth Troske (2004), 'Wage and Productivity Dispersion in US Manufacturing: The Role of Computer Investments', *Journal of Labor Economics* 22(2): 397-429.

Claudia Goldin and Lawrence Katz (2007), 'Long-run Changes in the US Wage Structure: Narrowing, Widening, Polarizing', National Bureau of Economic Research Working Paper No. 13568.

Jonathan Haskel and Ralf Martin (2002), 'The UK Manufacturing Productivity Spread', Ceriba Working Paper (<http://www.ceriba.org.uk>).

Richard Layard, Stephen Nickell and Richard Jackman (2005), *Unemployment: Macroeconomic Performance and the Labour Market*, Oxford University Press.

Stephen Machin and John Van Reenen (2007), 'Changes in Wage Inequality', CEP Special Paper No. 18, forthcoming in *The New Palgrave Dictionary of Economics* (<http://cep.lse.ac.uk/pubs/download/special/cepsp18.pdf>).

A major source of rising inequality is greater dispersion in firms' productivity related to their use of new technology

