

In the second of CEP's 'big ideas' series, **Stephen Machin** surveys significant research findings on wage inequality that have emerged from the Centre over the past three decades.

Big ideas

Rising wage inequality

Accurately documenting – and understanding the causes of – rising labour market inequalities have been a major preoccupation of CEP researchers over many years. While the study of wage and employment structures dates back a long way in economics (at least as far as Adam Smith), the large body of more recent academic literature on rising inequality began in the early to mid-1990s. It sprang from a recognition that wage gaps between higher and lower paid workers were rapidly widening in a number of countries, notably the UK and the United States.

There are at least two main aspects of this research to which CEP economists have made significant contributions and shaped the debate. The first is careful use of large-scale microeconomic data on individuals' wages and employment to document what happened and to measure accurately the extent to which the wage distribution widened.

For many years, economists had pointed to the stability of the wage structure. But there was a sense in the late 1980s and early 1990s that things were changing. In the early to mid-1990s, CEP researchers Stephen Machin and John

Schmitt (then a doctoral student at CEP and now a senior economist at the Center for Economic and Policy Research in Washington, DC), using data sources such as the General Household Survey and the New Earnings Survey, were the first to document the substantial increase in wage inequality that had occurred since the late 1970s (Schmitt, 1995; Machin, 1996).

Simultaneously, CEP research fellow Richard Freeman of Harvard University was documenting a similar increase in wage inequality in the United States – which was worse than in the UK as those at the bottom were experiencing large real falls in their earnings.

The second significant contribution was to develop a better understanding of the proximate causes of rising wage inequality. Influential cross-country work from the late 1980s by Stephen Machin, John Van Reenen and various co-authors pinpointed 'skill-biased technological change' as a force operating in the labour markets of a number of industrialised countries as generating greater labour market inequality than in the past (Berman et al, 1998; Machin and Van Reenen, 1998; Nickell and Van Reenen, 2001).

This change consists of technological advances (such as computers) that have been observed to benefit more skilled or

educated workers and, at the same time, to be detrimental to the wages and employment prospects of less skilled or educated workers. As these technologies diffused into modern workplaces, the relative wages of skilled versus unskilled workers rose or the employment rates of the skilled versus the less skilled rose – or in some countries, notably the UK and the United States, both happened.

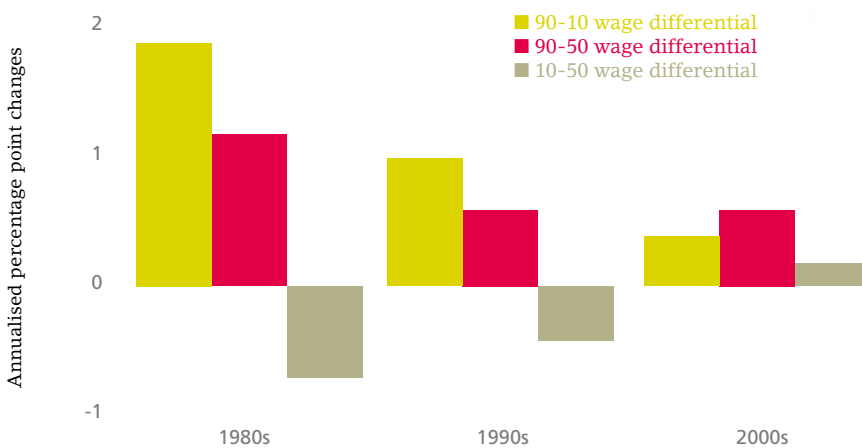
CEP researchers have continued to make significant contributions to this debate and we now know a lot more than we did when the initial research was undertaken. It has become evident that the sharpest burst of rising wage inequality in the UK occurred in the 1980s. In that decade, the whole wage distribution widened as successively higher percentiles of the wage distribution experienced higher relative wage growth (Machin, 1999).

This can be illustrated by thinking of 'upper tail wage inequality' as the wage at the ninetieth percentile (the wage received by someone 10% below the top of the wage distribution) relative to the fiftieth percentile (the person right in the middle), and 'lower tail wage inequality' analogously as the tenth percentile wage relative to the fiftieth.

Figure 1 shows decade-by-decade

The rises in UK and US wage inequality are due to a combination of technological change and institutional changes, such as union decline, affecting the labour market

Figure 1: Overall, upper tail and lower tail wage inequality rose significantly in the 1980s and at a slower pace in the 1990s; in the 2000s, lower tail inequality fell while upper tail inequality continued to rise



changes in overall, upper tail and lower tail wage inequality (in annualised percentage points). In the 1980s, both lower and upper tail inequality rose significantly as the 90-50 wage differential increased and the 10-50 wage differential fell. A key aspect to this was rising wage gaps between more and less educated workers – in other words, the wage ‘returns’ to education rose.

The next two decades proved

somewhat different, however. In the 1990s, wage inequality continued to rise but at a more muted pace. In the 2000s, lower tail inequality narrowed as the 10-50 differential increased but upper tail inequality continued to expand.

How does recent research reconcile these patterns of change? First of all, the ‘naïve’ story of skill-biased technological change has evolved into a more nuanced

one. It may be more plausible to think of technological advances as damaging the wage and employment prospects for workers in jobs that can be replaced by machines and computers – those jobs that require workers to perform routine tasks. At the same time, jobs requiring workers to do more complex, non-routine tasks cannot be replaced or downgraded in terms of the wages they pay in the same way.

So it was not only unskilled workers on the production line who saw their jobs disappear and wages fall, but also those relatively skilled workers like bank clerks who performed routine clerical tasks. Their jobs were increasingly replaced by new information technology such as ATM machines.

CEP work by Maarten Goos and Alan Manning showed that this process effectively caused a polarisation of the labour market (Goos and Manning, 2007). At the top end of the occupational structure, job growth since the late 1970s has been rapid – and wages have risen significantly. But the middle has hollowed out, as the jobs that could be replaced by automation have been lost. At the bottom end, there remain jobs that cannot be replaced by machines or computers – like cleaning or caring jobs – and the demand for some very low wage jobs has risen.

While we can say that the significant growth in upper tail inequality in the UK since the late 1970s was down in large part to skill-biased technological change, we had to find other mechanisms to explain the big rise in lower tail inequality in the 1980s and the subsequent bounce back of the 2000s. Here CEP research pointed to changes in the role of labour market institutions, in which there have been two important episodes.

First, the rapid decline of trade unions, which had traditionally propped up the wages and employment of low-skilled workers, played a role in rising lower tail inequality. Second, as documented in research by Richard Dickens and Alan Manning, the introduction of the National Minimum Wage in April 1999 has been important in securing sizeable relative wage gains for low paid workers in the 2000s and thus contributed to the more recent narrowing of lower tail inequality (Dickens and Manning, 2004).

Where does this leave us today? CEP research on this important question has been vital in documenting and explaining why labour market inequalities have risen over time in the UK, and in placing this rise into its appropriate international context. But many important issues are still outstanding.

For example, our work found that the role of developing countries and foreign competition in fostering lower wages for the less skilled in the UK was, perhaps

surprisingly, minimal. Although in theory, trading with poorer countries could lead to the wages of unskilled British workers 'being set in Beijing', this did not seem to be happening.

But this literature mainly pre-dated the rise of China and India in the mid-1990s, and ignored some of the ways in which trade itself could stimulate greater technical change. Both these issues are being pursued in our future work using new sources of data.

In conclusion, our work has shown that the recent rises in UK wage inequality have mainly been due to a combination of skill-biased technological change and institutional changes affecting

the labour market. But what kind of policies could be implemented to reverse the trend in inequality?

The long-term policy has to be the building up of human capital. But what is the best way to do this? In the shorter term, reform of labour market institutions such as the minimum wage and trade unions could also be important. We will turn to policies with the potential to tackle distributional problems in future issues of *CentrePiece*.

Stephen Machin is research director of CEP and professor of economics at University College London.

The long-term policy response to rising inequality has to be the building up of human capital

Further reading

Eli Berman, John Bound and Stephen Machin (1998) 'Implications of Skill-biased Technological Change: International Evidence', *Quarterly Journal of Economics* 113: 1245-80.

Richard Dickens and Alan Manning (2004) 'The National Minimum Wage and Wage Inequality', *Journal of the Royal Statistical Society Series A* 167.

Maarten Goos and Alan Manning (2007) 'Lousy and Lovely Jobs: The Rising Polarization of Work in Britain', *Review of Economics and Statistics* 89: 118-33.

Stephen Machin (1996) 'Wage Inequality in the UK', *Oxford Review of Economic Policy* 7: 49-62.

Stephen Machin (1999) 'Wage Inequality in the 1970s, 1980s and 1990s', in *The State of Working Britain* edited by Paul Gregg and Jonathan Wadsworth, Manchester University Press.

Stephen Machin and John Van Reenen (1998) 'Technology and Changes in Skill Structure:

Evidence from Seven OECD Countries', *Quarterly Journal of Economics* 113: 1215-44.

Stephen Nickell and John Van Reenen (2001) 'Technological Innovation and Economic Performance in the United Kingdom', in *Technological Innovation and Economic Performance* edited by Benn Steil, David Victor and Richard Nelson, Princeton University Press.

John Schmitt (1995) 'The Changing Structure of Male Earnings in Britain, 1974-88', in *Differences and Changes in Wage Structures* edited by Richard Freeman and Lawrence Katz, University of Chicago Press.