Do androids dream of better jobs?
Dystopian visions of the future sometimes portray a world in which robots, computers and other kinds of ‘thinking machines’ have displaced almost all human labour. We know that millions of clerical and manufacturing jobs have disappeared in recent years – and with talk of ‘driverless’ cars, taxi drivers are presumably the next set of workers feeling anxious about their prospects. So, our cover story asks, how much should we all be afraid for our future livelihoods and what might be a sensible policy response?

Researchers at the Centre for Economic Performance (CEP) have been exploring the effects of technological change on the labour market for several years. A decade ago, Alan Manning coined the term ‘job polarisation’ to describe the way that machines have replaced people doing routine tasks in the middle of the income distribution, leaving ‘lovely’ jobs for the highly educated and ‘lousy’ jobs for those with few skills. In this CentrePiece, he discusses how things have evolved in Britain since then.

There are understandable concerns that a continued squeeze of the middle of the labour market will have a further adverse impact on equality. But as Michael Boehm notes in his analysis of job polarisation in the United States, this need not necessarily be the case if governments and individuals make the right counteracting investments in education. That leads to a second core theme of CEP research: what are the most effective ways to improve children’s educational attainment?

Here, that question is addressed in two articles. Steve Gibbons and Sandra McNally review the evidence on whether increased spending on schools makes a real difference to results – and if so, whether we should invest more in early years, primary or secondary education.

And Peter Dolton reports on his global study of the social standing of teachers: he suggests that we can only get the very best from pupils by making teaching a better paid and higher status profession. Despite the growing use of computers in education, teaching would seem to be a job not easily done by machines. The same is true of management, a third longstanding focus of the Centre’s work. As our next issue will show, the CEP methodology for evaluating management quality first developed by Nick Bloom and John Van Reenen has now been used in a variety of settings – including manufacturing, retail, hospitals, universities and schools. In almost all these places, while technology has its role, it is the human agency of management that drives successful organisational performance.

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Machines and software programs have replaced employees in many routine jobs in the middle of the income distribution. Alan Manning, who coined the term ‘job polarisation’, considers how much we should all be afraid.

Lovely and lousy jobs

The occupational structure of Britain’s labour market has changed markedly in recent years. There has been rapid growth in the employment share of high-wage occupations, such as managers and professionals, and more modest but still positive growth in the share of low-wage occupations, such as shop assistants and care workers. But there have been significant falls in the employment share of clerical and manufacturing jobs in the middle of the income distribution.

Ten years ago, Maarten Goos and I charted this phenomenon of ‘job polarisation’ over the period 1979-99 (Goos and Manning, 2003). The evidence indicates that it has continued: Figure 1
We cannot ignore job polarisation – but with sensible policies, we can manage it

shows how the employment shares of different deciles of the occupational wage distribution have changed over the period 2002-10.

The most compelling explanation for job polarisation lies in the nature of technical progress. As David Autor and his colleagues noted a decade ago, machines come to replace people in routine tasks for which a software program of manageable length can be written to perform the task well (Autor et al, 2003).

For example, the job of a skilled craft worker in manufacturing involves precise work, but it is repetitive and relatively easy for a machine to replicate. Similarly, the job of a bank clerk used to require the ability to do arithmetic fast and accurately and was not defined as low-skilled – but computers can do the sums both faster and without error. So the demand for both types of jobs has been falling.

If the primary cause of job polarisation is routine work being done by machines, then it seems likely to continue as computers become ever more powerful. But does that necessarily imply a dystopian future in which we are increasingly displaced by machines? Do we risk going the way of our equine friends, once literally the workhorses of the economy but whose costs to rear and feed rose above those of machines doing the same work and so ended up surplus to requirements?

As yet, it is not easy to design a computer that will manage people and motivate them: management remains something in which people have a comparative advantage over machines. And jobs like cleaning, which we think of as being unskilled because they require no special aptitude, are currently beyond the capability of computers. So there are good reasons for thinking that we are some way from the machines taking over.

First, while technology will undoubtedly continue to displace humans in some tasks, there is no reason to think that the jobs affected will always be the middle-skill ones. If computers end up diagnosing illness and prescribing treatment more effectively than doctors, then demand for doctors, among the highest paid occupations, will fall. And not all middle-skill occupations are being displaced: computers cannot yet replace nurses, who typically earn a little bit more than the average salary and for whom the ageing population is raising demand. In 2012, average hourly earnings for nurses were £16.56 per hour; for the population as a whole, they were £14.87.

Second, there are things that can be done to lessen the impact of job polarisation. In large part, job polarisation matters because it raises inequality as the labour market splits into high- and low-wage jobs. But, the wages of different occupations are influenced by both the demand for the skills required to do the job and the supply of workers with the necessary skills.

The simplest way to realise the importance of the supply of skills is to imagine an economy where everyone has the same skills but someone still has to clean the toilets. In such an economy, the toilet cleaner will have to be paid more than everyone else because it is the most unpleasant job, and professional footballers, pop stars and chief executives would all be paid less. If such a world sounds unbelievable, it is because our world is one where not everyone has the same level of skills and the skills required to clean toilets are not in short supply.

It is sometimes argued that the ‘hollowing-out’ of the workforce means that improving education and skills for all

Figure 1: Job polarisation in Britain, 2002-10
is a mistaken policy – that what is needed is a very high-quality education for young people destined for the high-paid jobs and only basic education for those who will be working in the low-paid jobs.

But while there is little point in equipping workers with skills for which there will be no demand, it is not true that increasing the level of education across the board is irrelevant. Imagine a situation where all the middle-skill jobs disappear, leaving only high- and low-skill jobs. The pay of the high-skill jobs relative to the low-skill jobs will be influenced by the share of the population who can do high-skill jobs: the higher this share, the lower will be inequality. Aiming for equality in the distribution of human capital will be as important as it has ever been.

But what of the view that human capital will be increasingly irrelevant in the future as innovation is biased in favour of capital and the returns to capital will be rising relative to the wages of labour? Paul Krugman made this argument in the New York Times in a column entitled ‘Rise of the Robots’ in December 2012. According to this view, wage growth no longer closely tracks productivity and the share of labour in national income – more or less stable for a long time – is in decline.

But two of my colleagues have shown that this view does not stand up well to close scrutiny (Pessoa and Van Reenen, 2013, summarised on pages 10-12 of this issue of CentrePiece). Any ‘decoupling’ between the wage growth of the average worker and labour productivity can be adequately accounted for by the rise in wage inequality and by the growing gap between income received by workers and the labour costs paid by employers because of such factors as rising healthcare costs, payroll taxes and employer pension contributions.

Indeed, rather than too much capital investment in robots, it seems more likely that Britain’s much-discussed current stagnation in living standards is caused by too little capital investment. Rising wages have traditionally been associated with giving workers more capital with which to work and new capital tends to embody the latest technology.

But current levels of capital investment in the British economy – never the country’s strongest point – have become embarrassingly low in recent years. Internationally comparative data on the share of investment in GDP puts Britain 139th out of 153 countries, just behind El Salvador (though ahead of the United States).

Job polarisation continues to be an important feature of the way that Britain’s labour market is evolving. But there is little reason to believe that it will cause problems on an unmanageable scale. We cannot ignore it, but with sensible policies, we can manage it.

Aiming for equality in the distribution of human capital is as important as ever.
in brief...

‘Smart and illicit’: the making of a successful entrepreneur

Being self-employed doesn’t necessarily make someone an entrepreneur. Recognising this distinction has enabled Ross Levine and Yona Rubinstein to detect both the key characteristics of successful entrepreneurs and the true rewards to their innovations.

What makes a successful entrepreneur? It comes as no surprise that such traits as a high IQ, lots of education, abundant self-esteem and wealthy parents all contribute. But in a recent study, we also find that smart teenagers who engage in illicit activities are more likely to become successful entrepreneurs than equally intelligent, rule-abiding teenagers. It is the combination of ‘smart’ and ‘illicit’ tendencies that helps account for both the entry into entrepreneurship and the comparative earnings of entrepreneurs.

Although economists since Adam Smith have emphasised that profit-motivated entrepreneurs spur innovation and growth, a large body of previous research has yielded two puzzling findings. Analysing data on the self-employed to draw inferences about entrepreneurship, researchers have found first, that the average self-employed business owner earns less than a comparable salaried worker; and second, that self-employed and salaried individuals have similar characteristics.

How can it be that these ‘growth-creating innovators’ have cognitive and non-cognitive traits comparable to their salaried counterparts and earn less? Perhaps the self-employed are not a good proxy for entrepreneurs. After all, the self-employed category includes street vendors and the creators of software firms, gardeners and the founders of biotechnology businesses. While some of the self-employed are innovative leaders who mobilise capital to transform industries, others engage in qualitatively different activities.

In our study, we solve both puzzles by creating a better proxy for entrepreneurship and using it first, to identify the distinguishing characteristics of entrepreneurs; and second, to evaluate the pecuniary returns to entrepreneurship.

To create a better proxy for entrepreneurship, we divide the self-employed into two groups: the incorporated and unincorporated. History supports such a division: over several centuries, people created the incorporated business structure with the explicit goal of fostering entrepreneurship – investment in large, innovative and risky activities that typically involve a long gestation.

Incorporation has two defining characteristics – limited liability and a separate legal identity – that facilitate entrepreneurship. Limited liability reduces the potential downside losses to equity holders, increasing the appeal of purchasing equity in high-risk, high-expected return projects. A separate legal identity means that corporations can own property and enter into contracts independently of shareholders, so that shareholder-specific shocks are less likely to disrupt firms’ activities, increasing the appeal of investing in large, long-gestation projects.

But incorporation is not appropriate for all businesses, as there are additional direct and indirect costs. So when

Smart teenagers who engage in illicit activities are much more likely to become entrepreneurs
The incorporated self-employed earn much more per hour and work many more hours than the salaried and unincorporated.
Has the decline in manufacturing and clerical jobs been responsible for the lagging wages of middle-skill workers in the United States? To answer this question, **Michael Boehm** compares the occupational choices and earnings of survey respondents in the 1980s and today.

**Has job polarisation squeezed the American middle class?**

The decline of the middle class has been much debated in the United States and elsewhere in recent years. The first important component of this decline is the fall in the number of well-paid middle-skill jobs in manufacturing and clerical occupations since the 1980s (Acemoglu and Autor, 2011; Goos et al, 2009). Figure 1 depicts this phenomenon of ‘job polarisation’.

The second important component is the drop in relative earnings for workers around the median of the wage distribution over the same period. This is depicted in Figure 2.

Economic research, much of it conducted at CEP, has illuminated the first component of the decline in middle-skill jobs. It has done this by relating job polarisation to rapid changes in information and communication technologies, which have made it possible for machines to take on the routine tasks previously done by workers in middle-skill jobs (Autor et al, 2003; Michaels, 2010; Michaels et al, 2013).

To date, the second component of the decline of the middle class – lagging

**Figure 1:** Changes in US employment shares by occupations since the end of the 1980s

<table>
<thead>
<tr>
<th>Occupation</th>
<th>NLSY</th>
<th>CPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-skill</td>
<td>-10</td>
<td>-5</td>
</tr>
<tr>
<td>Middle-skill</td>
<td>-5</td>
<td>0</td>
</tr>
<tr>
<td>High-skill</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

**Notes:** The chart depicts the percentage point change in employment in the low-, middle- and high-skilled occupations in the NLSY and the comparable years and age group in the more standard CPS. The high-skill occupations comprise managerial, professional services and technical occupations. The middle-skill occupations comprise sales, office/administrative, production, and operator and labourer occupations. The low-skill occupations include protective, food, cleaning and personal service occupations.
Job polarisation has had strong effects on workers’ relative wages

wages – has not had as much academic scrutiny. In particular, there have been no studies that closely link the stagnant earnings for workers around the median of the wage distribution to the decline in middle-skill jobs.

My research addresses this issue by asking three interrelated questions:

- First, have the relative wages of workers in middle-skill occupations declined as predicted by the mechanisation of routine tasks explanation for job polarisation?
- Second, have the relative wage rates paid per ‘constant unit of skill’ in the middle-skill occupations dropped with polarisation?
- And third, can job polarisation explain the changes in the overall wage distribution?

I answer these questions by analysing two waves of a representative survey of young workers in the United States carried out in 1979 and 1997. The survey responses provide detailed and multidimensional characteristics of these young people that influence their occupational choices and wages.

Using these characteristics, I compute the probabilities of workers in the 1980s and today choosing middle-skill occupations and then compare the wages associated with these probabilities over time. My empirical strategy relies on predicting the occupations that today’s workers would have chosen had they lived in the 1980s and then comparing their wages to those of workers who actually chose those occupations at that time.

The results from this approach show a substantial negative effect of job polarisation on middle-skill workers. The positive wage effect associated with a 1% higher probability of working in high-skill jobs compared with middle-skill jobs almost doubles from 0.31% to 0.60% between the 1980s and today. And the negative wage effect associated with a 1% higher probability of working in low-skill services jobs compared with middle-skill jobs attenuates from -1.65% to -0.95% over the same period.

I find similar results when controlling for college education, which is arguably a measure of absolute skill. This suggests that it is indeed the relative advantage in the middle-skill occupations for which the returns in the labour market have declined.

In the next step of my analysis, I estimate the changes in relative market wage rates that are offered for a ‘constant unit of skill’ in each of the three occupational groups. We can think of wage rates paid per constant unit of skill as the hypothetical change in wages had the workers in the middle-skill occupations stayed the same across the two survey waves.

To do this, I use a standard economic model of occupational choice. This predicts a tight relationship between workers’ occupational choices and their earnings and market wage rates across the two survey waves, which I use to estimate the wage rates.

Again, the position of the middle-skill occupations deteriorates substantially: the wage rates paid in the high-skill...
occupations increased by 20% compared with the middle while the wage rate in the low-skill occupations rose by 30%. This decline in the relative attractiveness of working in the middle-skill occupations is of course in line with the massive outflow of workers from these jobs.

Finally, I check what effect changing prices of labour may have had on the overall wage distribution. Figure 3 shows that the change in the wage distribution due to these price effects reproduces the overall distribution reasonably well in the upper half while it fails to match the increase of wages for the lowest earners compared with middle earners.

At first glance, this is surprising given the strong increase in relative wage rates for low-skill work and the increase in the wages of workers in low-skill occupations. The reason is that these workers now move up in the wage distribution, which lifts not only the (low) quantiles where they started out but also the (middle) quantiles where they end up. The inverse happens for workers in middle-skill occupations but with the same effect on the wage distribution.

But these are only price effects and there may be additional wage effects from workers moving out of the middle-skill occupations into high- and low-skill occupations that I cannot definitively quantify in this study. Moreover, other researchers have suggested that the substantial increase in wages at the bottom of the wage distribution (which is unique to the United States while job polarisation is also happening elsewhere) may be partly due to policy-related changes, such as the minimum wage and de-unionisation. So the results for the lower part of the wage distribution remain somewhat inconclusive.

Overall, my research confirms that job polarisation has had strong effects on workers’ relative wages. While further studies need to examine more closely the ambiguous results for the lower part of the wage distribution, we can already predict that ever expanding improvements in technology are a force that not only displaces workers further up and down the skill distribution but also leads to substantially declining wages for these individuals.

But as Alan Manning points out in another article in this issue of CentrePiece (pages 2-4), this need not necessarily be the case. If governments and individuals make the right counteracting investments in education and training to improve the supply of skills (especially for the least skilled people), job polarisation may not have overly adverse consequences on inequality in the future.

This article summarises ‘Has Job Polarization Squeezed the Middle Class? Evidence from the Allocation of Talents’ by Michael Boehm, CEP Discussion Paper No. 1215 (http://cep.lse.ac.uk/pubs/download/dp1215.pdf).

Michael Boehm is an assistant professor at the University of Bonn and an occasional research assistant in CEP’s labour markets programme.

Further reading


Have UK and US workers been denied their fair share of economic growth over the past four decades? **João Paulo Pessoa** and **John Van Reenen** investigate claims that wages have become ‘decoupled’ from productivity.

### Wage growth and productivity growth: the myth and reality of ‘decoupling’

It is often argued that American workers are being exploited by the firms for which they work. Exhibit 1 in the case for the prosecution is that real wages of the typical worker have hardly increased in four decades while labour productivity has continued to grow steadily. In other words, the pie is growing, but capital and the very richest workers (the ‘top 1%’ decried by the Occupy Wall Street movement) have eaten it.

Recently, it has been suggested that the UK is starting to follow the same unhappy path with productivity growth outpacing wages. Is this true? Well, not really.

Have wages decoupled from productivity?

The ugly label for the phenomenon of wage growth falling behind productivity growth is ‘decoupling’ – that is, wages have become ‘decoupled’ from productivity. Basic economics suggests that workers’ real hourly compensation should grow in line with GDP per hour worked over the long run. But between 1972 and 2010, US productivity grew by 84% while median wages only grew by 21%. We call this by the even more ugly term – ‘gross decoupling’.

In the UK, things were also bad, but not quite so awful – the same measure of real productivity grew by 114% and median real wages by 72%. So gross decoupling was a whopping 63 percentage points in the United States (84% minus 21%) and a substantial 42 percentage points in the UK (114% minus 72%).

Is this proof that the Occupy protesters are right and that workers are being denied their fair share of economic growth? Not so fast: what basic economics focuses on is ‘net decoupling’, which is the idea that average compensation should roughly follow GDP per hour deflated in the same way. In the UK, net decoupling is basically zero: both
wages and productivity have risen by roughly the same amount since 1972. In the United States, there is a bit of net decoupling: about 13%.

So what explains this massive difference between gross and net decoupling? In the UK, it is basically two things: inequality and non-wage labour costs. First, the UK has had growing wage inequality since the late 1970s and this means that the average wage has risen much faster than the median wage (the wage that separates the population into two halves, 50% earning more than the median earner and 50% earning less).

Second, non-wage labour costs, such as pension contributions and healthcare benefits, have risen very quickly. These are all part of what is called ‘compensation’, which is what employers care about, not just the direct cost of paying salaries.

The United States has experienced even larger increases in inequality and non-wage labour costs than the UK and these two factors account for about half of the gross decoupling between US productivity and wages. But in addition, there is a growing divergence between the GDP deflator and the consumer price deflator with the GDP price deflator rising much more slowly than measured consumer prices (which implies that profit margins are rising). This is much less true in the UK, although recent Office for National Statistics (ONS) data revisions may increase this component.

No one has quite figured out why this is, but it is probably related to the fact that the prices of investment goods related to information and communications technologies (ICT) – servers, networks, enterprise software and the like – have fallen faster than measured consumer prices of ICT goods. Different measures of consumer prices make the inflation contribution to gross decoupling fluctuate between six and 30 percentage points in the United States.

**Breaking it all down**

Looking at particular sectors of the economy, three are striking in terms of decoupling. First, non-market services (public services, such as administration, education, health and defence, as well as private education, health and social work and real estate activities) observed a surprising degree of net decoupling between 1972 and 2007 (19%). But these are sectors where output is very hard to measure.

Second, in the period up to 2007, financial and business services saw a faster growth in compensation (96%) compared with productivity (92%), which indicates negative net decoupling – that is, workers doing better than shareholders. Finally, compensation for workers in personal services (such as hotels and restaurants) grew much faster than productivity in the sector (186% compared with 76%), a massive negative net decoupling.

All this can be seen for the period 1972-2010 in Figure 1. Gross decoupling was 42% but net decoupling (the grey solid bar) was -0.8%. The purple bar is the contribution of wage inequality (16.6%) and the pink bar represents ‘benefits’ (a 16% contribution), the difference between wages and compensation. This explains most of the divergence between gross and net decoupling, with a smaller part coming from price deflators.

Another way of checking these results is to look at the labour share of national income. That has basically been constant in the UK, which is consistent with our

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**Figure 1:** Explaining ‘gross decoupling’ – the difference between the growth of productivity and real wages (GDP per hour deflated by the GDP deflator and median wages deflated by the consumer price index) UK, 1972-2010

![Graph showing gross decoupling contributions](image)

**Notes:** Each bar is the contribution of the different elements accounting for gross decoupling in the UK – the fact that GDP per hour deflated by the GDP deflator grew by 42% more than the growth of median wages deflated by the consumer price index.
analysis (see Figure 2). If average compensation had really grown much more slowly than productivity, the share of profits in GDP would have risen a lot and the share of labour would have fallen.

Although there is variation over the business cycle, the share of income going to labour in 2010 was basically the same as it was 40 years ago. Indeed, there has been more of a fall in the labour share of income in continental European countries and Japan. This might be evidence of capitalists doing a lot better than workers in these countries whereas workers have done relatively better in the UK and the United States.

Policy implications

In terms of policy, the decoupling debate has shed more heat than light. Our results suggest that net decoupling has been overstated and cannot be used to justify redressing the overall balance between wages and profits.

The real problem is inequality among employees – wage inequality has risen massively since the late 1970s. In the United States, the share of income of the top 1% is 19%, higher than it has been for a century and about the same as in 1928, just prior to the Wall Street crash that ushered in the Great Depression and World War II. Although the share of the top 1% is lower in the UK, it still rose from 6% in 1979 to 15% by the eve of the Great Recession.

Economics has focused on understanding the causes of wage inequality over the last 20 years. Fundamentally, rapid technological change and the integration of low-wage economies like China and India into the global economy have increased the relative demand for more skilled workers. Improving the quantity and quality of skills for people in the bottom half of the education distribution must be the main priority for policy-makers in the UK and the United States. This will boost productivity and real wages.


João Paulo Pessoa is an occasional research assistant in CEP’s productivity and innovation programme.

John Van Reenen is director of CEP.

Figure 2: The share of labour income in UK GDP, 1972-2010

Source: ONS, OECD and KLEMS; all measures adjusted for self-employment.

Improving skills in the bottom half of the education distribution will boost productivity and real wages.
Governments that are serious about attracting the best people to work in their state education systems must look not only at the salaries they offer but also at the social standing of teachers. **Peter Dolton** presents the results of the first global comparison of teachers’ status in society.

### The status of teachers

In the debate about how to improve educational attainment, the role of teachers is paramount. Indeed, it has become widely accepted in recent years that attracting good quality and well-qualified people into teaching is a pre-requisite for raising standards. In Finland and Singapore, for example, where standards are highest, teachers are recruited from the most qualified graduates, all with at least a second degree.

One obvious way that these countries have attracted the best and brightest into teaching is by paying them well. My research – summarised in the Autumn 2011 CentrePiece (Volume 16, Issue 2) – has demonstrated the link between the level of teachers’ salaries and a country’s educational performance.

The influence of teacher status – the social and cultural forces that determine how much we respect teachers – is harder to measure. But it is vital to do so since the brightest graduates, those who are in demand from the best employers, are unlikely to want to join a profession that is publicly denigrated or seen as a second-best option.

There have been many international comparisons of educational performance, including the OECD’s Programme for International Student Assessment (PISA).

But teacher status has never been examined in any comprehensive way. It is common for people to remember a vanished halcyon age when teachers were respected or to feel that their own country alone has stopped giving teachers the respect that they deserve. But until now, there has been very little evidence to substantiate these perceptions.

Aware of this gap, the Varkey GEMS Foundation commissioned me to oversee the 2013 Global Teacher Status Index, the first large-scale international comparison of the status of teachers. The same questions were put to around 21,000 people across 21 countries in Asia, the Americas, Europe and the Middle East.

To gauge the social standing of teachers, we invited respondents to rank teachers against other professions, such as doctors, lawyers, librarians, nurses and social workers. We also asked for views on how much, in a fair world, teachers should be paid. And we posed a question that goes to the heart of attitudes towards teachers: would you encourage your own child to become a teacher? The survey responses were then condensed into the global index, with rankings for each of the 21 countries.

The results are not entirely predictable. Teachers have the highest status in China and Greece and the lowest in Brazil and Israel. The United States and most European countries, including the UK, rank halfway down the index. But the UK comes higher than most other European countries – including Finland – as well as other countries with a similar level of GDP per capita, such as France and Germany.

As in most of the countries surveyed, people in the UK were most likely to compare teachers to nurses and social workers and around a quarter would encourage their child to become a teacher – which, though low, is higher than the...
proportion in Finland, France and Germany. And the UK's secondary school teachers have the highest status among all European countries polled.

So why do the UK's teachers have a comparatively higher status than in other European countries? It is hard to be definitive but UK teachers do earn more than in many European countries – including France, Italy, Portugal and Spain. Yet many countries pay their teachers more than in the UK and some, like Finland, reap the reward from higher pay in terms of better pupil performance while others, such as Germany, do not.

Second, UK education has focused heavily on targets in recent years, so there is a general understanding that teaching has become a very demanding job. And third, the relative success of the UK could be more to do with the unhappy mood in France and Germany, where there have been intense public debates about the quality of their education systems. After both countries performed disappointing in the PISA rankings, there has been a bout of national navel-gazing that has not happened in the UK – and this may have adversely affected the status of teachers.

Another finding for the UK is that the status of head teachers is higher than in any other country. This is perhaps because of the recent phenomenon of the ‘super-head’ and the idea of head teachers as ‘agents of change’ in the education system. In many other countries, there is a notable cultural difference, with head teachers seen more as administrators than pedagogical leaders.

What about the role of teaching unions? It may come as a surprise that UK opinion is split on whether they should have a greater or lesser role in determining teachers’ pay and conditions. Over 40% of people say that unions have too little influence whereas fewer than 30% say that they have too much influence. Perhaps this is because the unions have not been involved in high profile industrial action that the public has noticed for many years – despite recent regional strikes. This probably contributes to teachers being more popular in the UK than in France and the United States, where there has been more recent union unrest.

In most countries surveyed, there is a clear pecking order: head teachers are respected most, followed by secondary school teachers and then primary school teachers. The exceptions are France, China, Turkey and the United States, where primary school teachers are respected more than their secondary school colleagues. In most countries, the public feels that teachers should have higher salaries – though in France, Japan and the United States, the view is that they should be paid less. And at least a half of all people polled support performance-related pay for teachers.

In two thirds of the countries surveyed, teachers are most likely to be compared to social workers. In the United States, teachers are most often compared to librarians – perhaps because libraries are located next to schools in many American towns. Librarians and social workers are in the bottom half of our occupational status ranking, so these comparisons show that there is a long way to go before teachers are thought of in

We will only attract the brightest graduates into teaching if it is seen as both a highly paid and high status profession
the same bracket as lawyers and doctors, who come out top of our ranking.

But the starkest differences are between East and West. Teachers in China, Egypt, Singapore, South Korea and Turkey have a higher status than in the United States and every country surveyed in Europe with the exception of Greece. In European countries, between a fifth and a quarter of people tend to think that pupils respect teachers – compared with 75% in China.

Fewer than 20% of Germans would encourage their child to become a teacher compared with nearly 50% of people in China. Out of all the countries surveyed, only Chinese people tend to compare teachers with doctors. Here, cultural issues may be at work: teaching seems to be treated with more reverence in Asian societies, especially in China. And while doctors in China may not have quite the highest ranking of all occupations, as they do in Europe, it is still one of the most prestigious jobs.

These findings have an important message for governments in these times of austerity. There is no clear link between teacher status and pupil outcomes. A large part of the reason for this is that occupational status is indistinguishable from remuneration in some countries whereas it is entirely distinct from pay in other countries.

The upshot is that governments cannot expect that improving the status of teachers will lead to better pupil outcomes without, at the same time, making teachers well remunerated. Presenting teaching as a vocation in which social respect is the only reward is doomed to failure. There is no ‘free lunch’ for governments that want teachers to do ‘more for less’.

But this is not necessarily a straightforward demand to increase the pay of all existing teachers. What we want is for the profession to become more attractive to our brightest graduates, who will be able to get the best from pupils. We will only be able to attract them if teaching is seen as both a highly paid and high status profession.

My own view is that in the UK, we will not improve the status of teachers until teaching is properly recognised as a profession. Lawyers and doctors have their own professional bodies such as the Law Society and the General Medical Council (GMC). These organisations represent their professions but also regulate the conduct of their members. If a doctor is found to have compromised professional standards, the GMC can take sanctions against them. These bodies are therefore respected in a way that unions are not because they are seen as being on the side of the public. In addition, a professional body of this kind for teaching may deflect the criticisms of politicians who often blame teachers for the ills of education and wider society.

Others will have different ideas for how to raise the status of teaching. By publishing this index, we hope to encourage a debate – from education ministries to staff rooms – about how we bring about the transformation in teacher status that the next generation needs and which teachers themselves deserve.

This article summarises the 2013 Global Teacher Status Index by Peter Dolton and Oscar Marcenaro-Gutierrez, published by the Varkey GEMS Foundation (https://www.varkeygemsfoundation.org/teacherindex).

Peter Dolton is professor of economics at Sussex University and a senior research fellow in CEP’s education and skills programme. Oscar Marcenaro-Gutierrez is at the University of Malaga.
Blackout babies: the impact of power cuts on fertility

What are the effects on national fertility of the frequent and sometimes protracted losses of electricity that are common in many developing countries? Amar Shanghavi and colleagues look at Colombia’s experience of a nationwide blackout 20 years ago.
The idea that blackouts might lead to baby booms has been a subject of contention for a long time. It first came to prominence in popular culture after the great New York blackout of 1965, which left over 30 million people without electricity for 13 hours. But a study of the event's consequences concluded that there was no significant impact on fertility nine months later, as a result of which the president of the Population Association of America described the theory as an ‘urban legend’.

Unlike the New York blackout or indeed most power outages in the developed world, nationwide blackouts are a recurring feature of developing countries. As an example of the scale, 600 million Indians were affected by a two-day blackout in July 2012. And many countries in Africa experience rolling blackouts that last weeks if not months and for several hours a day.

The impact of power outages on fertility is an important policy issue. For example, barriers of access to family planning may translate a temporary increase in fertility into a permanent increase in the population. In addition, if a woman is at a critical stage of life, say in her teens or early adulthood, having an unintended birth could damage her educational attainment, her career development and even her romantic relationships. This could lead to a young woman being ‘out of sync’ with her peers, an extra challenge above and beyond becoming a mother at an early age.

The scale and scope of power outages in developing countries provide the perfect natural experiment to test whether there is a link between electricity rationing and fertility. Our research makes two contributions to this debate. First, we provide evidence that there is a causal effect of power outages on both short- and long-run fertility. We examine a particular blackout in Colombia caused by the El Niño droughts in 1992, which led to a period of almost 12 months of daily rationing of electricity.

The blackout has some appealing features for the purpose of analysis: because it was caused by an unforeseen climate change phenomenon, it was completely unexpected; it lasted for one year, long enough for sufficient statistical power to detect the impact on fertility and long-run family size, and since it affected the whole country, it was very clearly delimited in time and space.

To identify the effect of the rolling blackout, we construct two novel datasets. First, we use a sample of the 2005 population census of Colombia to construct retrospective birth histories linking mothers to children within the household. We combine this dataset with municipality-level variation in the intensity of lights at night as measured by satellite images for the period 1992-93.

We document an increase of 0.005 percentage points in the probability of having a child in 1993. When evaluated at the average probability of having a child in any given year, this results in an increase in the chance of women giving birth by 4%. This implies that if the whole of Colombia were to lose power for one year, an additional 27,000 children would be born.

We also identify heterogeneous effects by age cohorts: almost all of the effect of increased fertility was among women between the ages of 15 and 30 in 1992. This fertility effect persists: a quarter of women who gave birth following the blackout had a higher total fertility 13 years later than comparable women who had not become mothers then.

It is an open question how unplanned pregnancies affect mothers’ future lives. The second contribution of our research is to use the intensity of the blackout to study the effect of the change in fertility on the later economic outcomes of young mothers. We find evidence that women who had an unplanned birth following the blackout and could not adjust their lifetime fertility are twice as likely to be single mothers as comparable women who did not have ‘blackout babies’. They are also much less likely to have completed a university degree.

These findings suggest that there have been significant and long-term negative consequences of the blackout for some young women in Colombia. Having found this for one country, we need further research to see if the effect holds elsewhere in the world, particularly where power outages are a regular occurrence.


Thiemo Fetzer, Oliver Pardo and Amar Shanghavi are all at the LSE.
Would increasing the share of Britain’s national income devoted to education make much of a difference? And what is the ideal balance of spending between early years, primary and secondary education? Steve Gibbons and Sandra McNally review the research evidence on the causal effects of school resources on pupil outcomes.

Does school spending matter?
This expenditure change is roughly equivalent to a class size reduction of 23%. The largest impacts are an improvement of between seven and nine points from a similar-sized resource increase.

In comparison, our own work on English primary schools (Gibbons et al, 2011) finds effects at the upper end of the range. The results here imply that a 30% increase in average expenditure per pupil improved test scores by about eight points on our 1-100 scale. This expenditure increase could fund average class size reductions of six or seven pupils.

The benchmark estimates from the one large-scale experimental study – the Project STAR (Student-Teacher Achievement Ratio) experiment in Tennessee in the 1980s – are somewhere in the middle of this range. Among the most frequently cited of studies, this was a large-scale randomised trial of lower class sizes for pupils during their first four years in school. A class size reduction from 24 to 16 was associated with an improvement of between four and six points on our 1-100 scale, which suggests that a 30% increase in expenditure per pupil would lead to an increase of three to four points.

Whether these impacts are small or large is debatable. The scale of the effects appears small when judged against the overall variation in pupil achievement. But countless studies

Increases in resources are typically more effective in disadvantaged schools and for disadvantaged pupils.
demonstrate that most variation in pupil test scores is due to family background, parental inputs, natural pupil abilities and purely random variation, none of which are easily manipulated by educational policy. Only a very small share of the differences in children’s achievements can be attributed to differences between schools or differences between teachers.

To get a better sense of whether it is worthwhile spending these extra resources, we need some cost-benefit analyses. Take an improvement of six points on our 1-100 scale. Making some simple calculations based on previous evidence suggests that any investment that raises children’s achievement by this amount at a cost of less than £6,200 per child (across all years of education to age 10) is worthwhile in terms of future labour market earnings alone. This comes from results in Machin and McNally (2008), which imply that a six-point change in average test scores at age 10 would raise earnings by about 2.4%.

The upper-end estimates of resource impacts imply that policy to increase school resources comfortably passes this cost-benefit test. But the lowest estimates suggest that the labour market benefits of additional resources would fall well short of the costs. More work is needed to narrow this down, for example, by a statistical ‘meta-analysis’ of recent studies, and new large-scale randomised control trials.

Of course, higher test scores and higher labour market earnings are not the only goals of education policy. One limitation of existing research is that it is primarily about cognitive skills as measured by in-school test scores. A few studies have looked at longer-run outcomes, such as staying on rates and earnings, but this research is data-intensive, requiring linked data on pupils’ schooling, post-school education and labour market outcomes.

There are also many other non-cognitive and social outcomes that are hard to measure but which should form important areas of future investigation. The recent long-term study of Project STAR is important in this respect (Chetty et al, 2011).

There are some general patterns that have emerged from our review. A first notable point is that increases in resourcing are usually more effective for disadvantaged schools and/or pupils. If this indicates that disadvantaged pupils are genuinely more responsive to resource-based interventions, then targeting resources at these pupils will lead to higher average achievement, as well as more equitable outcomes.

A second common pattern is that research designs that analyse different sources of variation in resources and class sizes tend to come to different conclusions. Some studies derive their estimates from marginal changes from year to year in class sizes and resources within schools, arising from natural population variation. These studies generally struggle to find large or significant resource effects. In contrast, studies that look at large cross-sectional resource differences between classes or schools – for example, those generated by maximum class size rules, budget allocation formula or the Project STAR experiment – typically find much bigger effects.

One potential reason for this discrepancy is that pupils and teachers might respond differently to small and large changes. For example, schools, teachers, pupils and parents involved in the educational process adapt more easily to marginal changes in resources from year to year, and accommodate these
changes by adjusting effort and engagement in the educational process. Compensatory behaviour of this kind will tend to ‘crowd out’ and mask the effects of resource changes.

If this behaviour is more feasible for incremental changes in resources than for large changes, then estimates based on marginal year-to-year changes in resources tell us little about the impacts of more substantial policy changes. Teachers may be able to accommodate changes of one or two pupils in a class easily without any impact on achievement, but they would respond very differently to a halving or doubling of class size. More work is needed to assess whether these different ways of measuring the impact of resource change threaten the value of the interpretation of the evidence on resources.

A key question is whether an increase in resources invested in early years and primary education are more effective than an increase allocated to secondary education and later years, which would justify a transfer of resources to earlier educational stages. Our reading of the evidence is that there is no compelling case to support a transfer from later to early stages of education given the current state of knowledge.

There is certainly evidence that differences in achievement open up early in a child’s life, and subsequent achievements are closely linked to early achievements. This in turn implies that there is a theoretical advantage in addressing disparities in achievement early on, so that these disparities are not propagated to, and amplified in, later stages of the lifecycle (Cunha and Heckman, 2007). The problem is that it is not obvious from the existing empirical evidence that it is any easier to address the small disparities early on in life through policy interventions than it is to address disparities later on. So it would be premature to advocate a shift of resources given the current information available.

On balance, there are more studies finding positive resource impacts in primary school and early years than in secondary school. But this is partly because there have been more studies of primary education and the research designs have typically been better. Where comparable designs are available in the same economic and educational context (for example, studies using the National Pupil Database in England), the effect sizes at different phases seem comparable.

Moreover, a closer reading of the research evidence suggests that a balanced approach spreading investments evenly across the various stages of education is preferable to interventions at any one stage. The benefits of investments at an early age, although potentially offering higher returns, erode during later phases of childhood unless they are topped up with subsequent investments.

This article summarises ‘The Effects of Resources Across School Phases: A Summary of Recent Evidence’ by Steve Gibbons and Sandra McNally, CEP Discussion Paper No. 1226 (http://cep.lse.ac.uk/pubs/download/qp1226.pdf). The report was commissioned by Ofsted, Britain’s official body for inspecting schools, as part of a project aimed at evaluating the effectiveness of educational policy across all phases of schooling.

Steve Gibbons is director of the Spatial Economics Research Centre (SERC) and reader in economic geography at LSE.

Sandra McNally is professor of economics at the University of Surrey and director of CEP’s research programme on education and skills.

Further reading


Conventional wisdom suggests that it is always best to place children with higher-performing peers. Our research, which looks at their later outcomes, indicates that this is not necessarily true.

Imagine two pupils of the same high ability: one is top of their class but the other is in the middle because their school attracts many high-ability children. We find that the pupil who was top of the class becomes more confident and performs better in secondary school than the pupil who had the same test score in primary school but a lower rank.

These rankings are inferred by the pupils themselves as it is not standard practice for teachers to discuss rankings. We find that being highly ranked during primary school has a positive effect on later test scores that is equivalent to being taught by a highly effective teacher for one year. And being ranked in the top quarter of your primary school peers as opposed to the bottom quarter improves later test scores by twice as much as being taught by a highly effective teacher for one year.

Similar effects apply across subjects. For example, a primary school pupil who got the same score in English, maths and science but happened to be ranked higher in class in maths would on average achieve better secondary school results in maths than in English or science.

We also find that boys are four times more affected by being top of the class than girls. Similarly, pupils who receive free school meals gain more from being at the top, although they do not seem to suffer in terms of their later test scores from being ranked in the lower half of their class.

Our findings come from analysis of Department for Education records of the national exam results of all state school pupils in England. These provided us with data on more than two million pupils across five cohorts whom we could track from primary school into secondary school. We measured their initial ability using test scores in English, maths and science at the end of primary school; the outcomes were their results in key stage 3 tests in the same subjects at age 14.

So what explains the impact of ranking on later outcomes? Our hypothesis is that it emerges through pupils making comparisons between themselves and their peers, which affects their conceptions of themselves. A pupil who was top of the class in maths develops more confidence in the subject, is less likely to be put off by difficult questions and hence requires less effort to succeed. This lower ‘cost’ of effort in maths encourages them to invest relatively more in the subject.

To test the role of confidence, we combined the data on pupils’ test scores with a survey of 15,000 pupils, which asked them directly about how confident they felt in English, maths and science. Even after accounting for actual test scores, pupils’ rank among their peers is a key determinant of their confidence.

Our findings run counter to the common assumption that having better peers is always the best for children. Indeed, they suggest that there are situations where a child will be better off not going to school with high-performing peers: this is especially true for boys. While we cannot make every pupil top of the class, our research highlights the importance of confidence in order to succeed.

Boys may be better off not going to school with high-performing peers.
The principle of rank improving confidence and later outcomes can be applied to many other settings. Imagine a child being the best in their street at football: they would become more confident and may enjoy the sport more. As a result, they would end up spending more time playing football and further improving their skills.

We believe these findings have implications for performance in both the classroom and the workplace. The most important one is that non-cognitive skills such as confidence, perseverance and resilience have large effects on achievement. Teachers and managers should recognise the potential impact of rank on individuals’ performance, playing it up for those of high rank who will be encouraged. For individuals who are high performers but find themselves in a high-performing peer group where they end up with a low rank, managers should emphasise their general rank.

This article summarises ‘The Importance of Rank Position’ by Richard Murphy and Felix Weinhardt, CEP Discussion Paper No. 1241 (http://cep.lse.ac.uk/pubs/download/dp1241.pdf).

Richard Murphy is a research economist in CEP’s education and skills programme. Felix Weinhardt is an Economic and Social Research Council post-doctoral fellow at CEP.
in brief...

Eating disorders: the impact of self-image and peer pressure

It is widely believed that the proliferation of anorexia and bulimia among young women in Europe is heavily influenced by social attitudes towards physical appearance. A new study by Joan Costa-i-Font and Mireia Jofre-Bonet confirms this fact and argues for government intervention to prevent a potential epidemic of eating disorders.

There has been a growing debate in many countries about potentially life-threatening eating disorders, especially since the Brazilian model Ana Carolina Reston died from anorexia in 2006. Policy interventions to curb both the rise in eating disorders and excessive preoccupation with self-image are increasingly being used. They include regulation of the fashion industry and advertisements, as well as support campaigns through social networks (Borzekowski et al, 2010) and the media (Burke, 2009).

More generally, it is becoming increasingly apparent that standards of physical appearance are important and powerful motivators of human behaviour, especially influencing preoccupations around health and food. Excessive preoccupation with self-image is regarded as a contributing factor to the proliferation of eating disorders, especially among young women.

Anorexia and bulimia can be characterised by a distorted body image accompanied by an eating obsession. But how do people get a distorted body image? Social scientists typically think of social image as being continually under construction and essential in determining physical, psychological and social equilibrium (Schilder, 1958; Orbach, 1993). When applied to eating disorders, this could explain some of the forms of weight aversion extreme enough to require policy attention.

In our latest study, we argue that a distorted self-image influences health-related behaviour, specifically eating disorders. We test our claims empirically using European data and find evidence that young women with a distorted self-image choose a net caloric intake that is below the optimal intake. Self-image is measured as 'self-reported perception of weight'.

We argue that the distortion is driven by the influence of 'peer weight' (which is likely to influence their self-image or social identity) on the likelihood of anorexia, and the influence of self-image on individual weight. In other words, we find that the larger the body mass of a young woman’s peers, the lower the likelihood that she will be anorexic (conditioned on her individual predisposition to have distorted thoughts).

Our results take advantage of the heterogeneity in weights and perceptions of weight in data on several cohorts of women in European countries. We use this to examine empirically the hypothesis that social pressure through stereotypes about the

Younger women are more sensitive to social changes that influence their self-image
ideal weight induces a distorted self-perception of one's own body, which can subsequently lead to the development of anorexia.

There is a large body of evidence that such ‘network effects’ are associated with a higher propensity to be obese (for example, Costa-Font and Gil, 2004) and can explain obesity gaps between countries (Costa-Font et al, 2010). Our new study is the first to use this idea to show that younger women’s preferences are at least as prone to being conditioned by network effects as those of their adult counterparts.

We suggest that younger women trade-off their health against the goal of meeting standards of beauty indirectly produced by their self-image. We also confirm the results of epidemiological research that weight-related eating disorders happen mostly at younger ages and require attention before they extend to older age groups. We know that a significant percentage of younger women who are anorexic remain so as they get older.

In the data we analyse, anorexia affects 3% of women aged between 15 and 34, just slightly higher than the percentage affected by severe anorexia. Both conditions follow a decreasing pattern up to the age of 35, after which they remain relatively constant at about 1%. We find that the prevalence of anorexia is just below 4% for the younger age group (15-24) and just below 2% among women aged 25-34. But it is worth noting that the International Journal of Eating Disorders finds that 10% or more of late adolescent and adult women report symptoms of eating disorders.

We find evidence that younger women are more likely to suffer anorexia, as they are more sensitive to changes in the social environment that influence their self-image. Secondary education or having been to university decrease the likelihood of being anorexic or severely anorexic, which indicates that policy interventions might need to take place between primary and secondary education to exert an influence.

Our results suggest that government intervention to redress people’s distorted self-image would be justified to prevent a potential epidemic of eating disorders. The distorted self-perception of women with eating disorders, and the importance of peer effects, may prompt governments to take action to compensate for social pressure on women driving the tension between ideal weight and health.

The larger the body mass of a woman’s peers, the lower the likelihood she will be anorexic
Does the introduction of ‘high-performance work systems’ really make a difference to business performance? Using representative data from British workplaces, Michael White and Alex Bryson assess the value of human resource management – and ask whether it is possible for firms to have ‘too little’ or ‘too much’.

**Human resource management: how much do firms really need?**

Human resource management (HRM) is widely regarded as one of the key elements of business strategy in a world where the knowledge, creativity and enterprise of employees often provide the sole competitive edge. A great deal of research effort – much of it done at CEP – has been devoted to demonstrating the links between HRM practices and business performance and to identifying ‘what works’.

Out of this research has come the central idea of ‘high-performance work systems’ (Appelbaum et al, 2000) and a wealth of studies showing that the practices that such systems embody – those focused on employee participation, skills development, team-working and incentives in combination – are associated with better business performance (see Bloom and Van Reenen, 2011, for a review of this body of work).

Yet despite this progress, there remain many unanswered questions and unquestioned assumptions about HRM. Are the associations between HRM practices and business performance truly causal? Or do already strong businesses adopt high-performance work systems because it is the ‘smart’ thing to do and their employees are ‘worth it’?
Does each step along the path of HRM implementation produce an additional response from employees and so an incremental improvement in business performance? Or is it only when some critical threshold of practice has been reached that a pay-off begins to show itself? And is it possible to do ‘too much’ HRM, leading to adverse consequences? These are some of the issues raised not only by HRM critics (of which there are plenty in Britain, though fewer in the United States) but also by its advocates.

There is little chance of demonstrating causality through experiments or quasi-experiments – HRM systems are too complex and too intertwined with business development and they may take years to develop. Instead, we have investigated whether there is at least a plausible mechanism through which HRM practices can influence performance. Focusing on mechanisms has been a common strategy in medical research where it has led to many advances, but it is less common in economic research, which often adopts a ‘black box’ approach.

Research on HRM suggests that the key mechanism probably lies in the motivations of employees. Practices of participation and team-working foster workplace experiences such as challenge, personal growth, variety, self-esteem, responsibility, autonomy and self-control. These are things that individuals intrinsically value and when those values are fulfilled, they obtain additional rewards to make their jobs more motivating. The HRM system then supports and reinforces these values through appropriate recruitment, training, in-job learning opportunities and financial rewards.

Furthermore, the research suggests that employees may become more committed to an organisation that offers them the opportunity to fulfil values with which they can identify. Such concepts have been introduced into economics by Akerlof and Kranton (2005) who propose that role ‘identity’ affects individual utility, and hence incentive, alongside financial reward.

But these are merely concepts: how can they be measured and tested in practice? Here, recent developments in work psychology prove very helpful. Theories of work motivation have been increasingly unified with theories of work attitudes and in parallel, there have been advances in identifying the work attitudes that best predict performance. For example, one study suggests that ‘overall job attitude’ – a combination of job satisfaction and organisational commitment – explains as much as one quarter of the variation in focal-task performance, wider ‘contextual’ performance, lateness, absence and quits (Harrison et al, 2006).

Theory and evidence therefore suggest that to demonstrate a plausible mechanism, one has only to show that HRM systems in practice do increase job satisfaction and organisational commitment. But while most HRM experts agree that a system is required to attain major pay-off, how much HRM (how many practices of the desirable type) constitutes a complete system? And what are the consequences when HRM development is still below that threshold? Moreover, some research has suggested that going far above the threshold level can adversely affect employees, via stress and exhaustion, so there may be an issue of too much HRM as well as too little.

Most research to date has made the simplifying assumption that every increment of HRM practice is of some positive value, leading to a linear relationship between practice and attitude or practice and performance. In our study, we assess both linear and non-linear relationships between the intensity of HRM system development – the number of practices implemented, across participation, teams, recruitment, training/development and incentives – and attitudinal measures of employees’ ‘intrinsic job satisfaction’ and ‘organisational commitment’.

The main results of our study are depicted in Figures 1 and 2. They strongly indicate a non-linear relationship between HRM intensity and attitudes. There appears to be a threshold (around 15 practices out of the 43 included in our HRM index) beyond which workplace attitudes become steeply and progressively more positive.

So rather than there being any problem of too much HRM, there is substantial evidence that too little HRM can be a problem. The left-hand portion of the curve slopes downwards so that
In terms of employee attitudes, it might be better to have no HRM than just a little

employee attitudes are most negative just before the threshold is reached. From the viewpoint of employee attitudes, it could be argued that it is better to have no HRM than to have just a little.

We estimate that about one half of British workplaces are in the lower end of HRM development and experiencing slightly depressed employee attitudes, while the other half are in the upper end of HRM development and experiencing increasingly positive attitudes. So there appears to be scope for really extensive gains in employee attitudes (and motivation) through the development of more complete HRM systems.

This conclusion has a high degree of generality. In the first place, our data come from the 2004 Workplace Employee Relations Survey and are representative of all British workplaces in the market sector except the very smallest. To ensure that our results do not depend on any peculiarity of the index of HRM system intensity that we constructed, we also looked at an alternative index of HRM practice. This one matched questions used in three British studies of recent years, and obtained very similar results.

Nonetheless, there is clearly more research to be done. It will be especially interesting to attempt replication with the 2011 Workplace Employee Relations Survey: what happens to the employee attitude curve as HRM becomes more widely and intensively adopted? And does a favourable impact of HRM on employee attitudes depend on the benign economic environment that existed in 2004 but had been lost by 2011?

There are also questions of a more fundamental nature. First and foremost, there is the underlying explanation for the threshold effect, an issue discussed in the work of Bowen and Ostroff (2004). Anyone maintaining that firms act rationally will also ask why not all of them adopt the more intensive HRM regimes to which employees respond if, as we believe, this contributes to business performance via the improved job satisfaction and organisational commitment of employees.

There are several possible reasons: for some workplaces, the costs may outweigh the benefits; or the benefits may vary for different kinds of firms – those with low intensity HRM may still be doing the best available to them. Or again, weaker and less intensive HRM systems may deliver other kinds of benefits, apart from employee motivation, to the firms operating at this level of development.

Some employers may also be confronted by constraints, such as opposition from middle management or trade unions, which make it hard to advance further. Such firms may be on the way to the kind of highly developed HRM system on which we focus, but the road ahead may be long and hard.

While we can speculate as to the possible reasons for selective, partial or constrained implementation of HRM systems in British workplaces, only additional research will reveal whether workplaces with low or moderate HRM development are suffering real losses as a result.

More complete HRM systems could deliver really extensive gains in employee motivation

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