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CentrePiece

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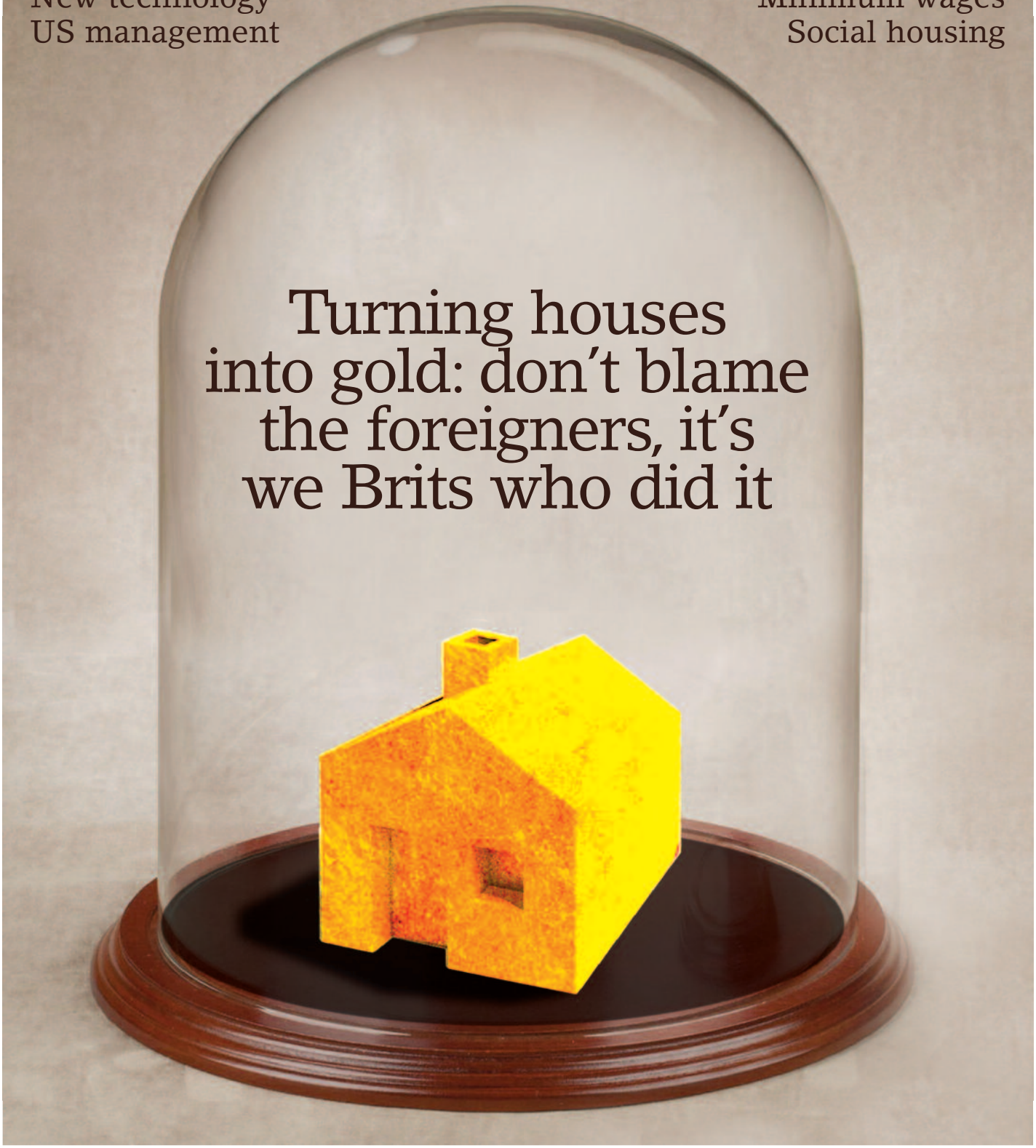
Gender gaps
Falling wages
New technology
US management

School management
Victorian internet
Minimum wages
Social housing

Turning houses into gold: don't blame the foreigners, it's we Brits who did it



CentrePiece

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

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Editorial

What determines how much people are paid for their work? What makes organisations successful at achieving the goals they set for themselves? And what are the effects of new technologies on the economic performance of people, organisations and whole communities? These are among the fundamental questions that the Centre for Economic Performance (CEP) has addressed over more than two decades of research. This *CentrePiece* describes some of the most striking new findings on pay, management and technological change – and their implications for policy and practice.

On pay, Alan Manning discusses the growing popularity of minimum wages as a way of tackling inequality; Ghazala Azmat and Barbara Petrongolo examine what experiments reveal about differences in how men and women are treated in the labour market; and CEP's research director Stephen Machin teams up with prominent commentator David Blanchflower to look at the prospects for reversing the significant fall in real wages in Britain since the financial crisis of 2008.

On organisational performance, Nick Bloom and colleagues use the CEP methodology for evaluating management quality to investigate how the systems of monitoring, target-setting and incentives in US companies influence their productivity and profitability. This innovative approach to data collection, first developed by Bloom and CEP's director John Van Reenen nearly a decade ago, has now been used in a variety of settings, including manufacturing, retail, hospitals and universities. Here, Renata Lemos outlines recent results on the management of schools around the world.

On technological progress, Van Reenen and colleagues illustrate the contrasting effects of information technologies, which empower frontline workers, and communication technologies, which tend to increase the centralisation of firms and reduce their employees' personal autonomy. And in an example of the renewed appetite for evidence from economic history, Claudia Steinwender goes back to Victorian times to see what can be learned about the economic impact of 'big data' from the transatlantic telegraph cable that connected Europe and North America in 1866.

Our cover story focuses on the very topical issue of Britain's crisis of housing affordability – an area in which CEP's colleagues in the Spatial Economics Research Centre have made important contributions to research and policy discussions. As Paul Cheshire explains, today's surging house prices have little to do with foreign speculators: they are the outcome of decades of misguided planning policies that have constrained the supply of land and turned houses into something like gold.

Romesh Vaitilingam, Editor
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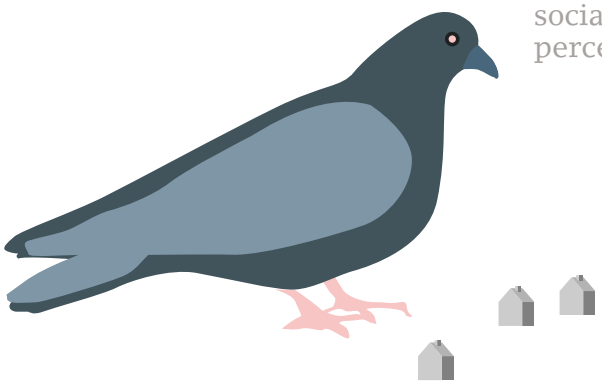

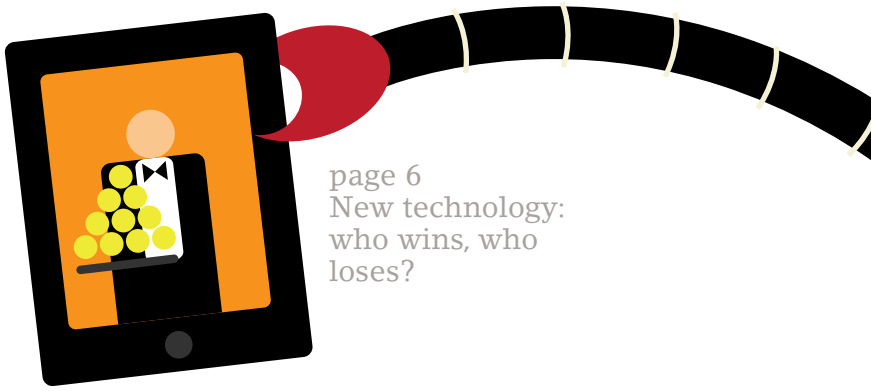

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Ticker tape based on Antonio Petrucelli, Fortune, June 1937

When new technology leads to a dramatic change in the availability of information, how do firms and markets respond? In a unique historical 'experiment', **Claudia Steinwender** evaluates the trade impact of the submarine transatlantic telegraph cable that connected Europe and North America in the mid-nineteenth century.

Victorian internet: the trade impact of the transatlantic telegraph

How do exporters gather information about overseas markets and forecast consumer demand for their products? What do they do if technology suddenly makes it possible to get access to better and more timely information? And what is the overall impact on prices, market integration and trade flows? These are challenging questions in the modern world of the internet and 'big data', where the vast amount of new information that firms can collect on consumers could have a significant impact on global economic interactions.

In a recent study, I have looked back to Victorian times to see what can be learned from the introduction of the transatlantic telegraph cable that connected Europe and North America. Before the cable was in place, steam ships were used to transmit information back and forth across the Atlantic: on average, a crossing took ten days, but it could be quicker or slower depending on the weather during the voyage. Once the cable was fully operational on 28 July 1866, there was almost real-time communication between the two continents.

Cotton was the most important traded good across the Atlantic in those days, and the telegraph cable was immediately used to exchange information about the cotton markets on each side of the ocean. I have collected data from newspapers of the time to understand the impact of this change in information technology on prices and trade flows.

Cotton was produced in the United States and shipped over to Britain, where it was spun into yarn and woven into textiles. Lancashire, notably the hinterland of Liverpool and 'Cottonopolis' Manchester, was the centre of worldwide textile manufacturing.

How did cotton get to Britain? American cotton farmers would sell their raw cotton to merchants at cotton exchanges at the ports, of which New York was the most important. The merchants then shipped the cotton over to Liverpool, where there was another organised exchange, and where they would sell the cotton to textile manufacturers from Lancashire.

Since shipping the cotton took time, when making the decision to buy cotton from farmers on any given day in New York, merchants had to forecast how large the demand for cotton would be when their shipment arrived. The telegraph brought more recent and up-to-date information about the Liverpool market. As a result, merchants were able to make better forecasts, and adjust exports better to the demand of textile manufacturers.

The historical data show that the telegraph led to a better integration of cotton markets. The 'law of one price' states that in efficient markets, the price for the identical good should be the same in different locations (after accounting for

Figure 1:
The price difference of US cotton between New York and Liverpool before and after the telegraph

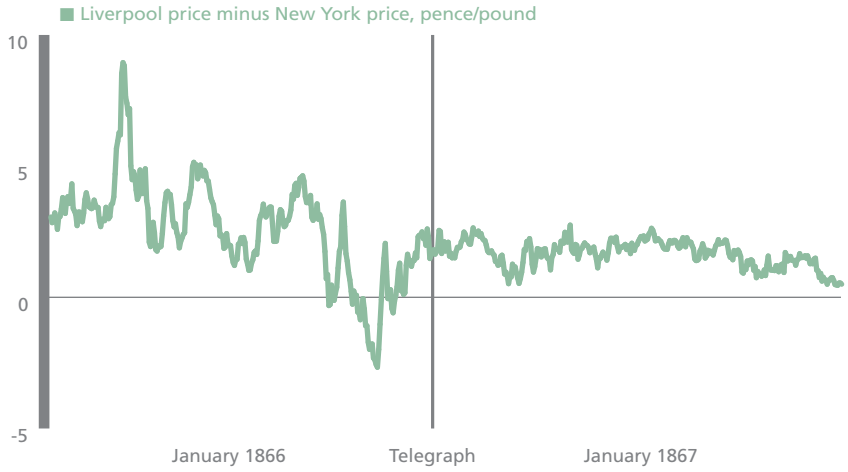
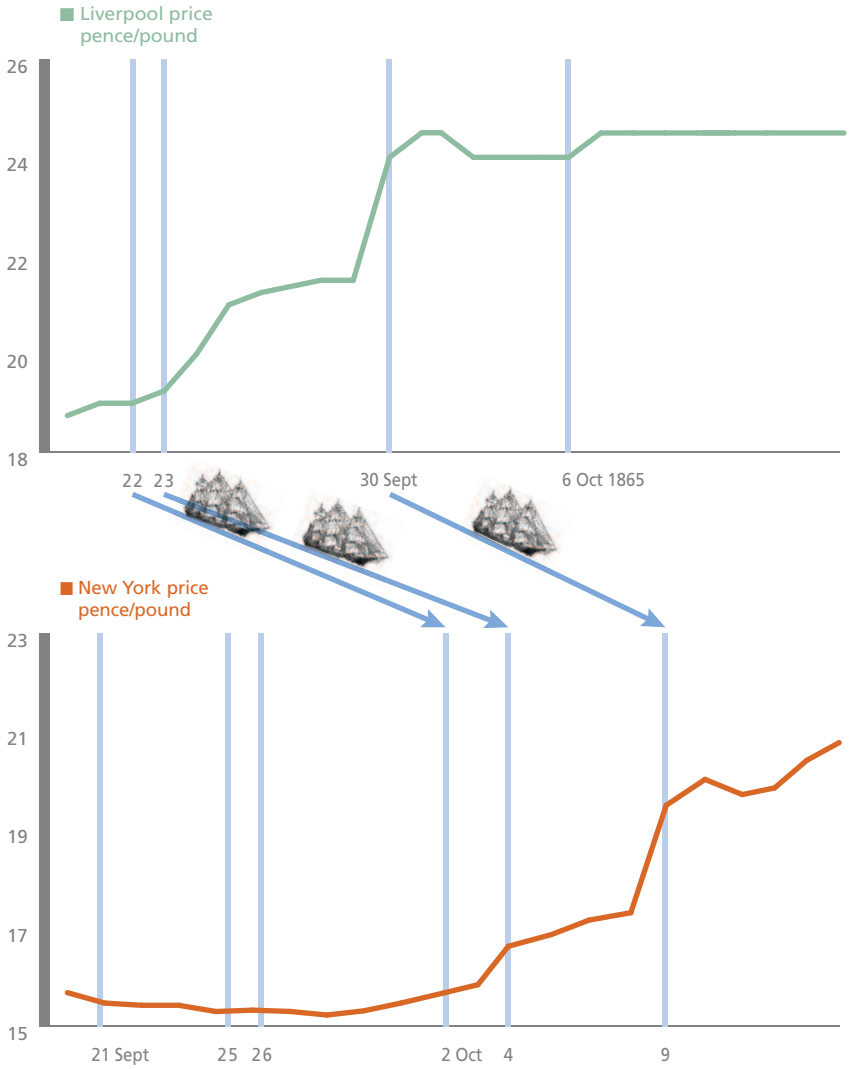


Figure 2:
How information affected prices before the transatlantic telegraph was established



Note: It took about nine days for a ship to sail the Atlantic, so a cotton price increase in Liverpool on 30 September 1865 did not result in a similar increase in New York until 9 October, when a ship arrived with the news.

The transatlantic telegraph led to better integration of cotton markets in New York and Liverpool, boosting trade

transport costs). If prices were to differ, there would be arbitrage opportunities for merchants to buy in one market and sell in the other.

Market integration can therefore be assessed by looking at the price difference of the same type of US cotton between New York and Liverpool. As Figure 1 shows, the volatility in the price difference was much larger before the telegraph and much less volatile afterwards. What's more, the average price difference was smaller after the telegraph. Overall, the cotton markets were better integrated after the telegraph. My analysis confirms that this holds taking account of shipping times, transport costs and other alternative explanations.

My research also shows that the smaller and less volatile price difference was a result of changing exports. After the telegraph, merchants were more aware of arbitrage opportunities, because they had more recent information when they were forecasting Liverpool demand, reducing their forecast error. As a result, overall exports actually became more volatile and, on average, larger. They became more volatile because with better information, exports could follow actual demand shocks more closely.

An anecdotal episode illustrates how information affected exports before the transatlantic telegraph got established. The upper panel of Figure 2 shows the price of US cotton in Liverpool. On 30 September, the price shot up because of increased demand from cotton millers. On the same day, nothing happened in New York, as the lower panel of Figure 2 shows – this was simply because New Yorkers weren't aware of the high demand for cotton in Liverpool.

On 2 and 4 October, steam ships arrived with news from Liverpool, but the 'news' that they carried was old and didn't yet incorporate the large demand shock. It was only on 9 October, when a steam ship arrived with the news about the demand shock, that the market in New York reacted.

The *New York Times* reported on that day: 'Cotton has been in decidedly more request, and, under the favorable advices from England…, prices have advanced materially.' Prices in New York went up because of increased export demand from merchants. The newspaper reported an 'unusually large quantity' of cotton being exported.

This episode illustrates how information affects the exporting behaviour of merchants and how it is necessary for market integration. Price shocks are transmitted faster across markets because export flows adjust – so information has real effects on the economy.

I estimate the efficiency gains from the telegraph to have been around 8% of the annual export value of cotton, a quite substantial number. Most of these efficiency gains came from better alignment of supply and demand: when millers wanted more cotton, the cotton was there, and there was no need to wait for the information to reach the other side of the Atlantic. A quarter of the efficiency gains came from the trade-inducing effect of the telegraph.

In other words, the introduction of the telegraph was equivalent to abolishing a 6% trade tariff. As a modern comparison, this is twice the average effect of the North American Free Trade Agreement (NAFTA), but it covers only half of the industry that was most affected by NAFTA: textiles.

The historical example of the transatlantic telegraph can be generalised to any setting in which exporters or producers have to make decisions in advance about production and/or exporting and face uncertainty about demand. In this setting, information technologies can improve the ability of firms to forecast demand. The forecast error of exporters becomes smaller and less volatile the better the available information. This leads firms to decide on production or export quantities that are better matched with consumer demand, which benefits everyone.

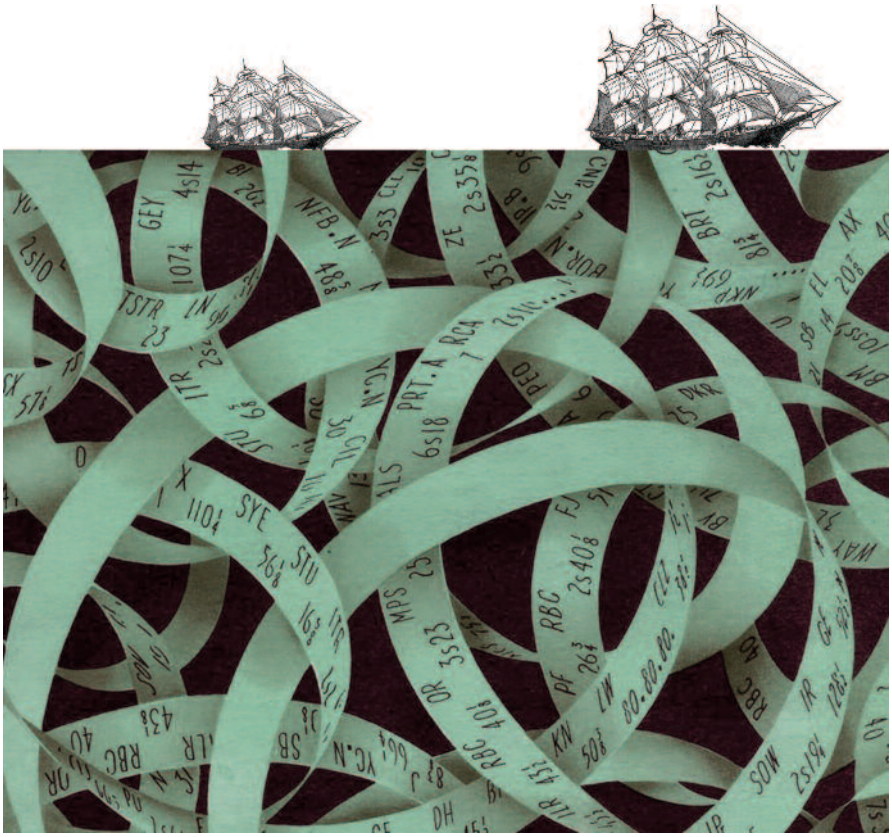
Identifying and reacting to demand changes are still critical in today's world. Demand fluctuates more rapidly and widely than in the past, as new trends appear and disseminate via social media networks. Global supply chains and outsourced stages of production make it more difficult to communicate demand changes across the different firms involved in the production process.

Newly emerging information technologies, such as the real-time analysis of 'big data', have the potential to affect trade in a similar and probably even more drastic way than the telegraph. The smart phone era has generated an enormous amount of real-time data on consumer behaviour.

The technologies for analysing these large amounts of data are still being developed, but they have the potential to provide firms with much more accurate demand forecasts. It is likely that the economic mechanism behind big data and the transatlantic telegraph cable is very similar.

This article summarises 'Information Frictions and the Law of One Price: When the States and the Kingdom became United' by Claudia Steinwender (http://personal.lse.ac.uk/steinwen/JMP_telegraph_ClaudiaSteinwender.pdf).

Claudia Steinwender is an occasional research assistant in CEP's globalisation programme.



The telegraph was the Victorian equivalent of today's 'big data', helping firms to forecast future demand

in brief...
New technology: who wins, who loses?

Different technologies can have very different effects on the labour market. An empirical study by **John Van Reenen** and colleagues finds that information technologies, which provide access to stored data, tend to empower frontline workers, while communication technologies like email put more power in the hands of senior managers in corporate headquarters.

A century ago, an ambassador to a distant nation would effectively operate as a viceroy, empowered to make decisions including matters of war and peace. But declines in communication costs have transformed this once powerful office into a glorified sales position, requiring the passing of the 'Ferrero Rocher' at parties, but few other important decisions.

The same advances in information and communication technologies (ICT) that diminished the occupation of ambassador have been a godsend for others. The last time you visited your physician's practice, you may well have seen a nurse practitioner rather than a doctor. Thanks to the ICT revolution, a nurse can diagnose a vast number of complaints that previously required a more expensive and highly trained doctor.

How do the same technologies that hurt one job aid another? If they empower nurses, what is it about them that lead to ambassadors losing their influence?

Technology has transformed the once powerful office of ambassador into a glorified sales position

The Janus-faced nature of new technologies

Some economists have assessed the impact of computers as a single technology (for example, Autor et al, 2003). Another strand of research argues that it is necessary to disaggregate the components of ICT to understand their impact on organisational structure and wages (for example, Garicano, 2000; and Caroli and Van Reenen, 2001). These studies analyse two separate effects of ICT stemming from the cost of accessing information stored in machines on the one hand and from the cost of communicating information between individuals on the other.

According to these theories, reductions in the cost of accessing information are a decentralising force, pushing power down the hierarchy and allowing frontline workers to solve more problems and rely less on the training of specialists. Thanks to databases like LexisNexis, para-legal lawyers can search the cases relevant to their clients without consulting overstretched senior partners.

In contrast, improvements in communication technology are a centralising force, pushing power up the corporate ladder. If people can communicate more cheaply, they will rely more on the help of bosses and solve fewer problems themselves. Individuals will specialise further and shopfloor workers will see the knowledge content of their work decrease. Individuals will learn less and ask for more direction. In particular, frontline people will rely more on headquarters.

These two changes will have different effects on wage inequality. Consider frontline workers. When information access is cheaper, they solve more problems and their time is worth more. On the other hand, when communication is cheaper, (for example, through email), they rely more on others and they become more of a 'machine' – their time is worth less.

This means that understanding the impact of technology on inequality requires analysis of whether quality is

increasing more quickly in information technology or in communication technology. So how can we actually observe and separate these two different effects?

Confronting theory with data

In our study, we separate the two effects using firm-level survey data on autonomy and new technologies. We have information on the autonomy of the plant manager compared with the chief executive over key decisions on investment, hiring, sales and innovation, as well as their 'span of control' (how many people report directly to them). We also observe the power of production workers compared with plant managers over the tasks they do and their pace of work.

We explore the impact of different types of technology on decision-making within a firm. The idea we want to test is whether improved information technology increases autonomy whereas improved communication technology reduces autonomy. Two of the indicators of information technologies we look at are software for enterprise resource planning (ERP); and computer assisted design/computer assisted manufacturing (CAD/CAM).

ERP systems – such as those produced by Germany's SAP – are software applications that allow firms to store, retrieve and share information on any aspect of production, sales or other firm process in real time. These systems reduce the cost of acquiring information and, according to our theory, we would expect them to lead to increased decentralisation in favour of local plant managers.

We also expect that workers with access to CAD/CAM will be able to solve a wider range of production problems, and therefore have less need to check with their supervisors. CAD/CAM should increase their autonomy and, by reducing the amount of help they need from plant managers, increase managers' span of control.

A key technological innovation that reduces communication costs is the growth of corporate intranets. We expect these to increase centralisation, with plant managers making more decisions for workers and headquarters making more decisions for managers. We test whether the availability of intranets reduces decision-making autonomy in both the production decisions of workers and the non-production decisions of managers.

We find that the evidence is strongly supportive of the theory. Information technologies like ERP and CAD/CAM increase autonomy whereas communication technologies like intranets reduce autonomy.

What the future holds for workers

Over the next 20 years, different jobs will be affected very differently by ICT depending on their relative intensity in communication and information. If your job is in travelling sales or as the local head of a multinational, expect it to go the way of the ambassador as more and more of it is done at headquarters. On the other hand, if your job is a nurse, a teaching assistant or a medical technician, expect ICT to increase the range of what you do, the knowledge content of your job and its pay and prestige.

This article summarises 'The Distinct Effects of Information Technology and Communication Technology on Firm Organization' by Nicholas Bloom, Luis Garicano, Raffaella Sadun and John Van Reenen, CEP Discussion Paper No. 927 (http://cep.lse.ac.uk/pubs/download/dp0927.pdf) and forthcoming in *Management Science*.

Nicholas Bloom is professor of economics at Stanford University. **Luis Garicano** is professor of economics and strategy at LSE. **Raffaella Sadun** is assistant professor of business administration at Harvard Business School. All three are research associates in CEP's productivity and innovation programme. **John Van Reenen** is director of CEP.

Further reading

David Autor, Frank Levy and Richard Murnane (2003) 'The Skill Content of Recent Technological Chance: An Empirical Exploration', *Quarterly Journal of Economics* 118(4): 1279-1333.

Eve Caroli and John Van Reenen (2001) 'Skill-biased Organisational Change? Evidence from British and French Establishments', *Quarterly Journal of Economics* 116(4): 1449-92.

Luis Garicano (2000) 'Hierarchies and the Organization of Knowledge in Production', *Journal of Political Economy* 108: 874-904.

Nurses, teaching assistants and medical technicians all benefit from the ICT revolution

Minimum wages are increasingly popular with politicians and the public; even most economists now agree that they have little or no negative effect on employment. **Alan Manning** discusses this newfound enthusiasm – and the likelihood that it will lead to much higher minimum wages in some parts of the world.

Minimum wages: the economics and the politics

There was a time when the minimum wage was seen as a backwater of labour market policy, an appendix for which the best one could hope would be that it did not cause any problems. But no longer: in many countries, there is now a strong movement to raise minimum wages.

In November last year, Angela Merkel finally announced that Germany would be introducing a minimum wage, replacing or supplementing the current system that sets minima in a small number of low-paying sectors and collective bargaining that sets minima in some other industries. In May this year, Swiss voters will be asked to vote on the world's highest minimum wage – 22 Swiss francs an hour (about £15) – with one canton already having voted for that rate in principle though another has rejected it. And in 2011, the free market redoubt of Hong Kong introduced a national minimum wage.

In the United States, President Obama seems to have given up hope of his proposal to raise the federal minimum wage to $10 per hour in the face of an impasse in Congress. But he has recently used his executive power to impose a $10.10 minimum wage on the few hundred thousand people who work on federal contracts.

The president is also actively encouraging states and cities to raise their local minimum wages, thus bypassing the obstacles in Washington. Increasing numbers of them are doing so, and some are going further: Seattle's mayor, for example, proposes a $15 minimum wage. Minimum wages at this level – about 60% of median hourly earnings – are pushing the envelope of what has ever before been attempted with the minimum wage.

The UK is not immune from this newfound enthusiasm for the minimum wage, with all the main political parties seemingly falling over themselves to find some way to inject new vigour into the National Minimum Wage. Last autumn, the business secretary Vince Cable wrote to the Low Pay Commission (LPC), asking it to consider the economic circumstances in which the minimum wage could be

increased at a rate above inflation. And the Labour Party has set up a Low Pay Review to consider options.

Not to be outdone, Chancellor George Osborne in January expressed the opinion that the nascent recovery means that the minimum wage can now be increased substantially. Without quite saying it in so many words, he dropped a heavy hint that he thought £7 an hour would be reasonable within 18 months, which would be a 10% increase from the current rate of £6.31.

I was a member of an expert panel convened by the Resolution Foundation and chaired by the LPC's first chairman George Bain to reinvigorate the National Minimum Wage. Central to our ideas was that the LPC has been very successful in doing a limited thing – setting a minimum wage to tackle extreme low pay. But the wider problem of low pay remains as serious as ever and – in spite of its name – the LPC has never attempted to develop a strategy for this bigger problem. The LPC seems to have convinced itself that the minimum wage could not be pushed much higher without threatening jobs, but the consequence is that we can never learn whether that judgment is correct.

So what explains this widespread enthusiasm for the minimum wage? In my view, both economics and politics are at play.

The economics of minimum wages

A generation ago, the vast majority of economists would have said that a rise in the minimum wage inevitably costs jobs. This has changed, with two strands of research having the biggest impact. In the United States, the work of David Card and Alan Krueger, then both at Princeton University, shattered the cosy consensus and argued that the actual evidence linking the minimum wage to job losses was weak. Although their findings were controversial (and the debates rumble on to the present day), there has been a large shift in the weight of academic opinion.

The other strand of research that has been very influential examined the UK experience, with CEP researchers playing a sizeable role, though not the only one. Some people predicted that the introduction of the National Minimum Wage in 1999 would cause hundreds of thousands of job losses, but this simply did not materialise. Any impact on employment seemed to be tiny and LPC research has reached similar conclusions for subsequent years when the minimum wage rose faster than average earnings.

In spite of this accumulating empirical evidence, it is still common to find economists falling back on the argument that a minimum wage must cost jobs because demand curves for labour inevitably slope downwards. Faced with a conflict between the evidence and twentieth century economic models, they reject the evidence rather than the theory – not an ideal template for scientific endeavour. But there are, in fact,

The driving force behind higher minimum wages is that they are very popular with voters

uncomplicated theoretical reasons why the minimum wage set at modest levels has little or no effect on employment.

First, the increase in total labour costs associated with a given increase in the legal minimum wage is often considerably smaller than the numbers suggest. As the minimum wage rises and work becomes more attractive, labour turnover rates and absenteeism tend to decline. Moreover, the cost associated with losing a job rises; so, arguably, workers are inclined to work a bit harder and need less monitoring. Of course, an employer could voluntarily choose to pay higher wages if net labour costs actually fell, so a reasonable guess here is that these offsetting economies reduce, but do not eliminate, the impact of a rise in wage rates.

Then there's the gap between employer perception and reality. Individual employers often view a rise in wages with horror, assuming it will drive them out of business. But all too often, they are implicitly assuming that they alone will suffer the cost inflation when it affects their competitors as well. Prices rise a bit and the effect on employment is only through the effect of a fall in sales, which may well be minimal.

But there is a more fundamental reason why there is no evidence of the job losses predicted by standard economic theory. The key assumption – that labour markets are highly competitive – is often wrong. The view of the labour market that underlies 'Economics 101' is not one that many people would recognise. For in this hypothetical world, losing a job is no big deal because finding an identical job is no harder than discovering that the local Sainsbury's is out of milk and going to Tesco instead.

But that is not most people's experience of labour markets. The reality is that competition for workers is not as strong as many economists would have you believe. An employer who cuts wages will find that most employees are unhappy, but that few will just walk out of the door. So it may make economic sense for employers to pay workers less than the marginal worker adds to revenues. In this more realistic world, a rise in the minimum wage will not necessarily price the marginal worker out of their job.

The politics of minimum wages

Academics might like to think their research has a big influence over public policy, but the driving force behind higher minimum wages is that they are very popular. Many people think there is something very wrong with an economic system in which someone who works hard is still unable to provide an adequate standard of living for themselves and their families. Such views have always been common, but they are much more common after the crisis when living standards are threatened and the link between growth and living standards seems to have been severed.

So in most countries of the world, voters (including right-wing voters) support rises in the minimum wage. In the UK, a poll in January 2014 found 66% favouring a substantial increase in the minimum wage – with majorities among supporters of all main political parties. In the United States, a poll in March 2013 found 71% in favour of raising the minimum wage, including 50% of Republicans. In Switzerland, voters seem to support the record-breaking minimum wage even as it is opposed by their government.

In some places, these political pressures will almost certainly lead to much higher minimum wages than we have seen in recent experience – perhaps to around the 60% of median earnings mark. This is the point at which many economists get nervous that negative effects on employment must surely kick in, but we do not have many studies to know whether these concerns are valid. There are only a few countries around this level currently – Australia and New Zealand (with low current unemployment rates) and France (with a more dysfunctional labour market) – so this is hardly conclusive one way or the other. But it seems likely we may be about to find out.

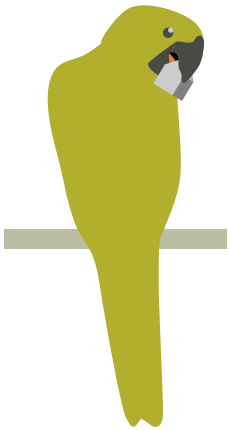
Alan Manning is professor of economics at LSE and director of CEP's community research programme.

His 2003 book, *Monopsony in Motion: Imperfect Competition in Labour Markets* (Princeton University Press), explains the theory behind minimum wages; and his 2009 *CentrePiece* article 'The UK's National Minimum Wage' describes CEP's role in providing the intellectual context for the policy, advising on its implementation and evaluating its impact (http://cep.lse.ac.uk/pubs/download/cp290.pdf).

'More than a Minimum: The Resolution Foundation Review of the Future of the National Minimum Wage', published in March 2014, is available here: http://www.resolutionfoundation.org/publications/more-minimum-review-minimum-wage-final-report

The UK's minimum wage has tackled extreme low pay – but the wider problem of low pay remains as serious as ever

Many white people in the UK feel that social landlords actively discriminate against them in favour of immigrants and ethnic minorities. Research by **Alan Manning** and colleagues finds no basis in reality for this perceived discrimination – but the recent history of social housing gives an indication of why that view has become so entrenched.



Immigrants' access to social housing: perception and reality

Ever since the late 1990s, UK citizens have consistently rated immigration as one of the most important issues facing the country. When asked why, the most popular answer is because of the supposed burden placed on public services, with the impact on jobs and wages coming second. But while we have a lot of research on the impact of immigration on the labour market*, there has been much less about the impact on public services.

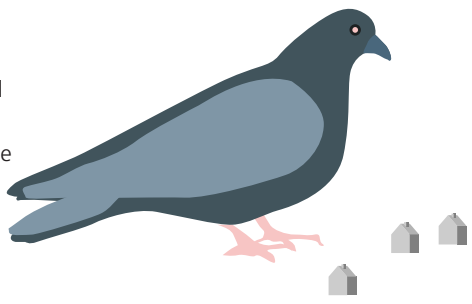
In recent research, we have been looking at the access of immigrants to social housing. This is important because rents in the social sector remain substantially below those in the private sector, and the social sector offers much greater stability of tenure. So social tenancies are very valuable to certain parts of the population.

Around a quarter of white British people in the UK feel that they are treated worse than people of other races by social landlords (councils and housing associations). As Figure 1 shows, this perception has varied a little over time but it has been consistently high. Such a level is extremely high – only the black community feel more discriminated against by parts of the criminal justice system than white people do by social landlords.

Figure 1:
Percentage of the white British population saying they thought they would be treated worse than people of other races by a council housing department or housing association

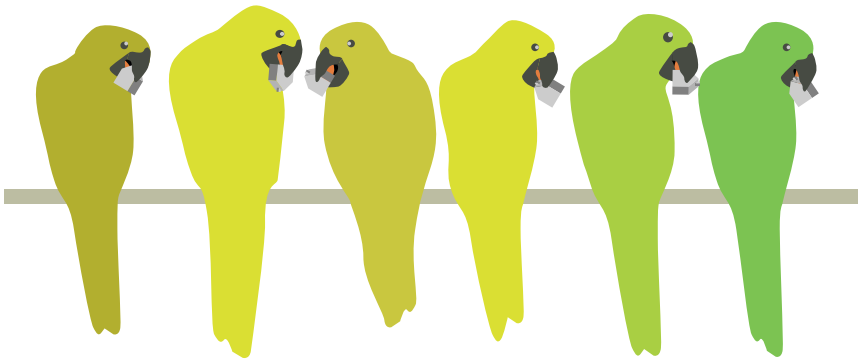
Source: Citizenship Survey, various years.

Organisations like the British National Party try to exploit these feelings, spreading the view that 'immigrants come here and are immediately given council homes while natives are pushed further and further back in the queue'. But is there any truth in this perception?



* Summarised in CEP Policy Analysis 'Immigration and the UK Labour Market: The latest evidence from economic research', June 2012 (http://cep.lse.ac.uk/pubs/download/pa014.pdf).

Both natives and immigrants suffer from the UK's failure to increase the social housing stock



Who is eligible for social housing?

To be offered a social tenancy, an individual must first be eligible to 'go on the waiting list'. There is no automatic eligibility for social housing for anyone in the UK (and the 2012 Localism Act has given local authorities more power to refuse to put an applicant on the waiting list). Indeed, the rules on eligibility are so complex that it is not possible, with existing data sources, to work out how many immigrants are eligible for social housing.

But at the risk of oversimplification, we can try to get a rough estimate using data on citizenship and length of time resident in the UK. UK citizens (whether acquired by birth or naturalisation) will generally have eligibility, as will immigrants from the European Economic Area (EEA) who have the right to reside in the UK, and non-EEA immigrants who have indefinite leave to remain (typically granted after about five years).

Table 1 shows that most immigrants in the UK are in categories where they would be expected to be eligible. And even those individuals who are not eligible (the final line of Table 1) might access social housing if they are in a household where some adult does have eligibility – this is shown in the second column of Table 1.

The bottom line is that it is probably over 90% of immigrants in the UK who have eligibility for council housing. The same rules apply for housing association tenancies that are nominated by local authorities, but those that are not are even less able to discriminate against immigrants.

Table 1:
Individual and household characteristics of immigrants

	Individual	**Household**
UK-born	0.0	31.0
Foreign-born UK citizen	42.1	28.2
EEA non-A8 citizen	16.5	12.3
A8 citizen	10.5	8.9
Non-EEA, in the UK for more than five years	17.7	11.6
Non-EEA, in the UK for five years or fewer	13.3	7.9

Source: Labour Force Survey, 2007-13 pooled; A8 citizens are those from the eight East European countries that joined the EU in 2004.

Table 2:
Differences in the probability of being in social housing for immigrant households relative to native households (adding demographic, regional and economic controls)

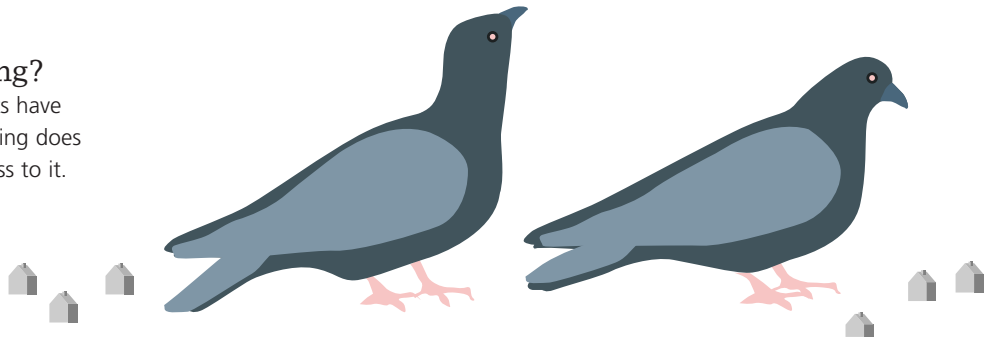
	(1)	**(2)**	**(3)**	**(4)**
UK citizen, foreign-born	+7.9*	+6.8*	+2.4*	-2.2*
EEA non-A8 citizen, foreign-born	+1.1*	-0.5	-4.8*	-8.4*
A8 citizen, foreign-born	-3.5*	-3.9*	-4.7*	-12.7*
Non-EEA citizen, foreign-born	+5.2*	+6.3*	+1.5*	-7.1*
Controls	None	Demographic	Demographic +regional	Demographic +regional +economic

Source: Labour Force Survey, 2007-13; * denotes significantly different from zero at 5% level.
Notes: Demographic controls are the number and age of adults and children in a household; regional controls divide the country into 20 regions; and economic controls are the number of working adults and the highest-paid occupation of any adult. The numbers in column (4) represent differences in the probability of being in social housing for immigrants relative to natives evaluated for a single adult workless household with two children living in the south east of England.

Who is in social housing?

But just because most immigrants have eligibility to apply for social housing does not mean that they will get access to it. Once on a list, most councils operate a points or banding system, which gives priority to certain types of households. Councils have considerable discretion in the nature of this system, but all use some assessment of needs, for example, household size and economic circumstances.

A simple comparison of the probability of being in social housing for immigrant and native households leads to the conclusion that EEA immigrants are less likely to be in social housing and non-EEA



immigrants are more likely to be in social housing compared with natives – this is column (1) of Table 2. But this is not comparing like with like – immigrants and natives differ in their household structure and economic circumstances. As column (4) of Table 2 shows, controlling for these factors reveals that immigrant households are less likely to be in social housing than equivalent native households.

Changes over time

This suggests that fears that immigrants somehow are given priority over equivalent native households in access to social housing are misplaced. But one source for the perception may be the following. Doing the same analysis for the late 1980s reveals that immigrants were very much less likely than equivalent native households to be in social housing. At that time, the allocation rules acted to reduce access to social housing for immigrants and ethnic minorities.

This change is very clear from the fractions of natives and immigrants in social housing. As Figure 2 shows, in the late 1980s, natives were much more likely than immigrants to be in social housing, but this was reversed by about 2000. These are the raw data, but controls for other factors suggest that this is a robust conclusion. It was plausibly the outcome of changes in the allocation rules in the 1980s and 1990s.

But as the access of immigrants and ethnic minorities to social housing improved, the stock of social housing was not increased. Indeed, as Figure 3 shows, construction of social housing has dropped to a very low level. So necessarily, the improved access for immigrants and ethnic minorities coincided with reduced access for natives. It is plausible that this change is what led to the widespread perception of discrimination against white natives.

Conclusion

Although most immigrants are likely to be eligible to apply for social housing, there is no evidence (once demographic, regional and economic circumstances are controlled for) that they have preferential access to social housing – if anything the reverse seems to be the case.

But it does seem that there is less discrimination against immigrants and ethnic minorities now than in the past and this removal of discrimination, coupled with a failure to increase the social housing stock, has reduced the availability of social housing for UK native households.

This is probably the source of some people's perception of discrimination. They are probably right to think that the part of the population attracted to social housing has been neglected, but they are wrong to think that this neglect applies just to them and not to immigrants as well.

This article summarises 'Immigration and the Access to Social Housing in the UK' by Diego Battiston, Richard Dickens, Alan Manning and Jonathan Wadsworth, CEP Discussion Paper No. 1264 (http://cep.lse.ac.uk/pubs/download/dp1264.pdf).

Alan Manning is professor of economics at LSE and director of CEP's community research programme. **Diego Battiston**, **Richard Dickens** and **Jonathan Wadsworth** are all contributors to CEP's community and labour markets programmes.

Figure 2:
Shares of immigrants and natives in social housing over time

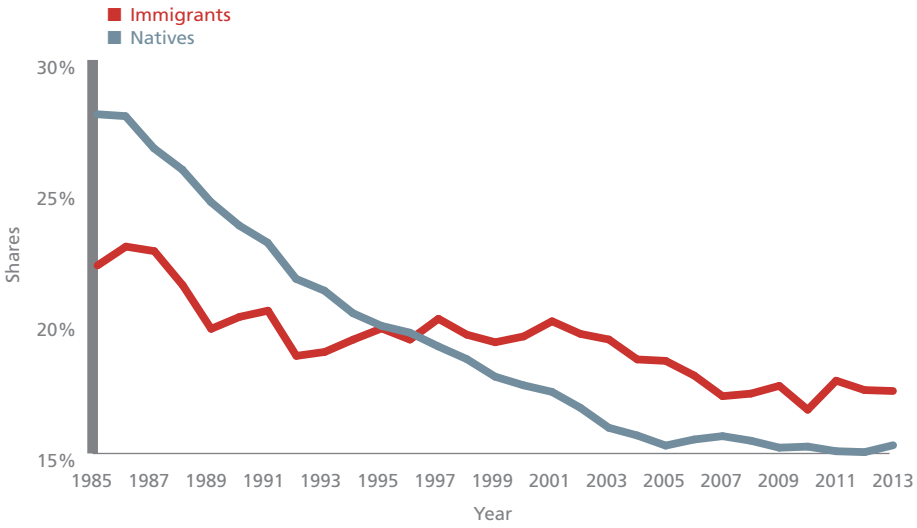
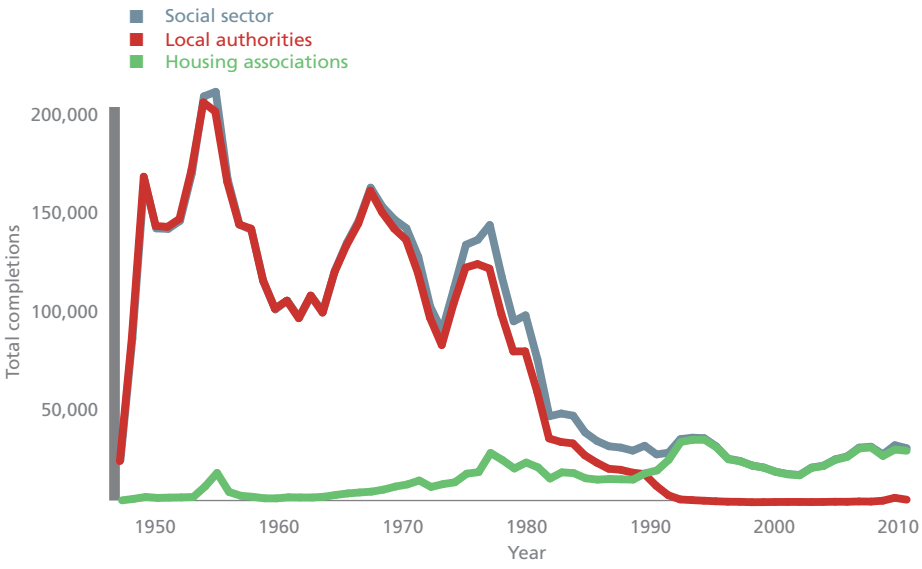


Figure 3:
Total completions of social housing



What lies behind Britain's crisis of housing affordability? As **Paul Cheshire** explains, it is nothing to do with foreign speculators but decades of planning policies that constrain the supply of houses and land and turn them into something like gold or artworks. He also exposes myths about the social and environmental benefits of 'greenbelts'.

Turning houses into gold: the failure of British planning

When things go wrong, it is always handy to blame foreigners and currently even the liberal press are blaming them for our crisis of housing affordability. The problem is not 50 luxury houses empty on London's Bishops Avenue (as *The Guardian* reported in January*) or foreign speculators buying luxury flats to keep empty in London. It is that we have not been building enough houses for more than 30 years – and those we have been building have too often been in the wrong place or of the wrong type to meet demand.

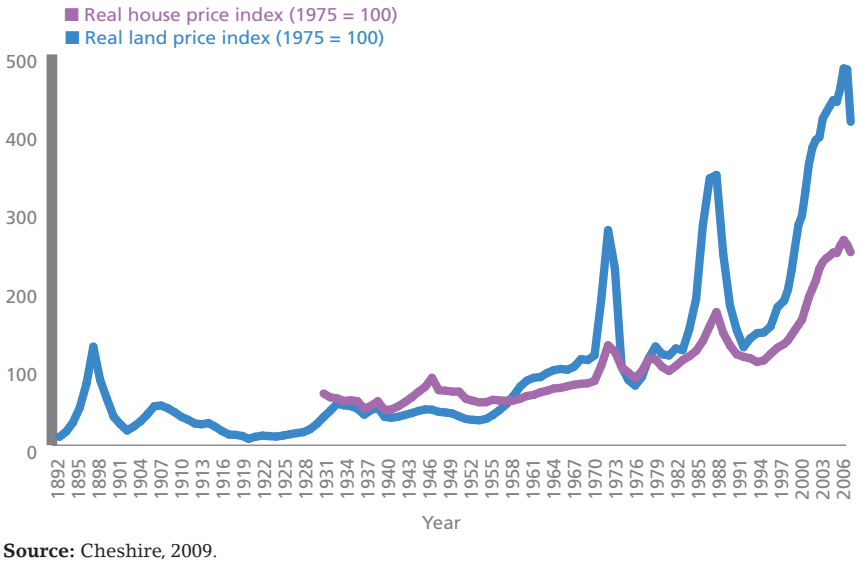
For example, twice as many houses were built in Doncaster and Barnsley in the five years to 2013 than in Oxford and Cambridge. Even that was better than the most distant date for which there are data on all four places, 2002/03: then, the northern cities managed nearly three times as many houses as the prosperous southern pair. Policy has been actively preventing houses from being built where they are most needed or most wanted – in the leafier and prosperous bits of ex-urban England.

In the 19 years from 1969 to 1989, we built over 4.3 million houses in England; in the 19 years from 1994 to 2012, we built fewer than 2.7 million. In 2009, the National Housing and Planning Advice Unit (which was set up as an independent technical source of advice in the wake of the Barker Reviews of housing supply and planning) estimated that to stabilise affordability, it would be necessary to build between 237,800 and 290,500 houses a year.

On a conservative estimate, that implies building 260,000 houses a year, which over 19 years would mean a total of over 4.9 million. Taking the difference between actual building between 1969 and 1989 and the advice unit's estimate of necessary annual building, this implies that between 1994 and 2012, building fell short of what was needed by between 1.6 and 2.3 million houses.

> Don't blame the foreigners: it's we Brits who turned houses into gold

Figure 1:
Real land and house price indices



Source: Cheshire, 2009.
Note: House and land data for war years are interpolated.

* http://www.theguardian.com/society/2014/jan/31/inside-london-billionaires-row-derelict-mansions-hampstead

This is what explains the crisis of housing affordability: we have a longstanding and endemic crisis of housing supply (Hilber and Vermeulen, 2012) – and it is caused primarily by policies that intentionally constrain the supply of housing land. It is not surprising to find that house prices increased by a factor of 3.36 from the start of 1998 to late 2013 in Britain as a whole and by a factor of 4.24 over the same period in London.

As Figure 1 shows, this is a really longstanding problem. Discounting inflation, house prices have gone up five-fold since 1955. But the price of the land needed to put houses on has increased in real terms by 15-fold over the same period.

Land is an input into housing. What developers will pay for it directly reflects the difference between construction costs and the expected price of the houses that can be built on it. Of course land can be substituted out of production – and it is. That is why new houses in England are not only some of the most expensive but also the smallest in the developed world.

But it is not possible to eliminate land from house construction altogether. Moreover, people value land directly as space – in living areas and gardens. Not only is 'space' a normal good, the demand for which rises as real incomes rise, it is particularly valued as people get richer. They do not want to buy more beds but bigger beds and bigger bedrooms, maybe a spare bedroom; they want a bit of garden and off-road space to park their car. Estimates suggest that a 10% increase in incomes leads people to spend about 20% more on space in houses and gardens (Cheshire and Sheppard, 1998).

It is true that rising real house prices mean that house owners feel richer. That was the political motivation for the 'Help to Buy' scheme.* But what rising house prices also mean is that young people will have to wait even longer to get any house at all, never mind a decent house with a bit of garden, and the quality of housing falls because houses become ever smaller as land prices are bid up.

What also happens – and this is central to our 'blame the foreigners and speculators' scapegoating – is that houses are converted from places in which to live into the most important financial asset people have; and the little land you can build them on becomes not just an input into house construction but a financial asset in its own right.

In other words, what policy is doing is turning houses and housing land into something like gold or artworks – into an asset for which there is an underlying consumption demand but which is in more or less fixed supply. So the price increasingly reflects its expected value relative to other investment assets. In the world as it has been since the financial crash of 2007/08, with interest rates at historic lows and great uncertainty in global markets, artworks and British houses have been transformed into very attractive investment assets.

Figure 2 tracks an index of global art prices against house prices since 1998. They move pretty closely together and the price growth of both hardly faltered with the 2007/08 crisis; but the price of houses has risen faster. At least one reason for the outperformance of houses is that while artworks may generate pleasure, they generate very limited income. Houses, however, provide more obviously marketable pleasure in the form of 'housing services' – we can live in them or rent them out.

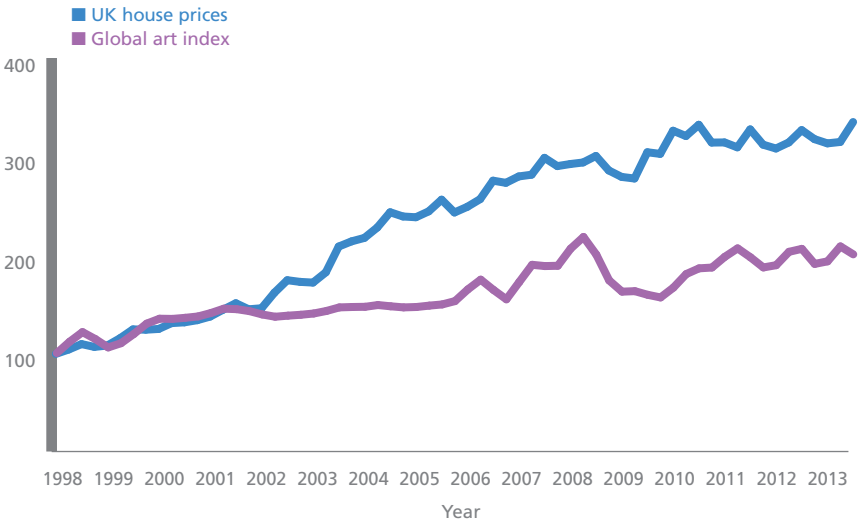
The more tightly we control the supply of land and houses, the more housing and housing land become like investment assets. In turn, the stronger the incentives for their owners to treat them as an option to hold in the expectation of future price rises.

So to blame speculators for housing shortages and rising prices is simply incorrect. It is our post-war public policy that has converted a good that is in principle in quite elastic supply into a scarce and appreciating asset. We can see this from the behaviour of housing and land prices before we imposed our constraints on land supply in the mid-1950s. We can also see it from housing markets – such as Switzerland or Germany – where policy ensures adequate housing is supplied.

Cities expanded at historically

Houses have been converted from places in which to live into people's most important financial asset

Figure 2:
Art and British house prices 1998-2013



Source: Cheshire et al, 2014.

* http://spatial-economics.blogspot.co.uk/2013/03/housing-and-more-than-housing-what-bad.html

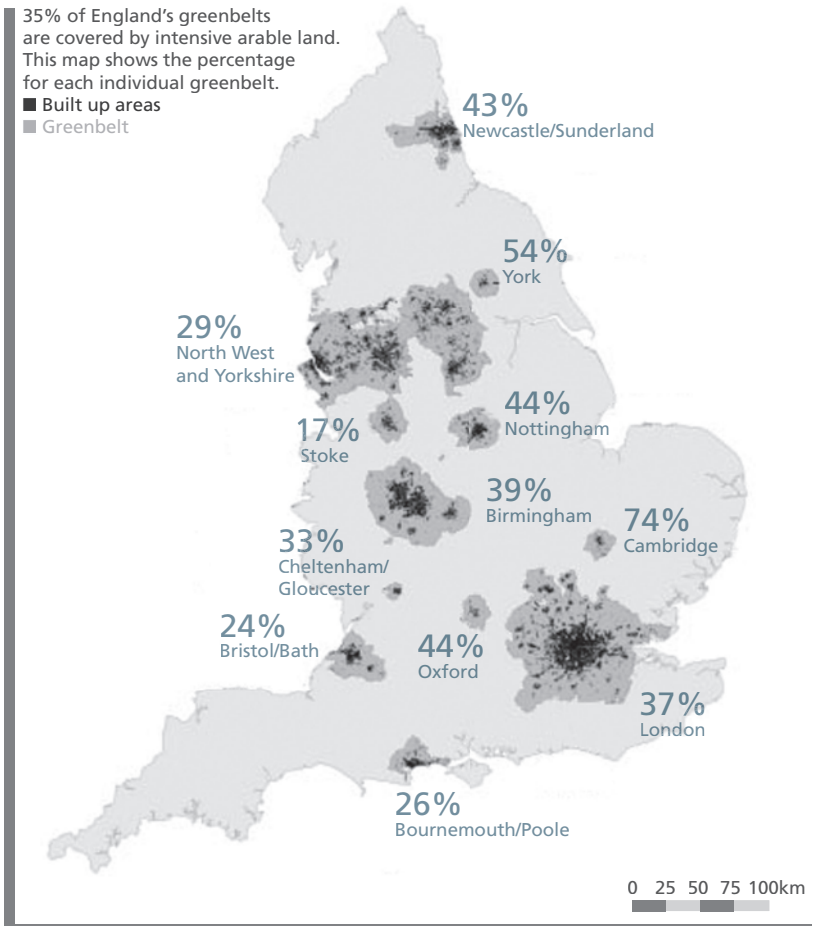
unprecedented rates in Britain during the nineteenth and early twentieth centuries, but urban land was not in restricted supply because new transport – commuter rail, trams, London's underground and then arterial roads – opened up land as it was needed. This was stopped by the 1947 Town and Country Planning Act, which expropriated development rights, invented a new legal definition of development so that any change of use required specific 'development' permission, and imposed urban containment policies with 'greenbelts' (Cheshire, 2009).

Additional barriers to building houses come from our pattern of government, how our local fiscal system interacts with property taxes and our insistence on using 'development control' (which requires any legally defined development to get specific permission from the local planning authority) rather than a rule-based system (as in continental Europe or the United States, where there are plans covering local communities and as long as a development conforms to these, it can go ahead). Details on these arguments are in a new book that brings together the wide range of work by the Spatial Economics Research Centre (SERC) over the past seven years (Cheshire et al, 2014).

Supporters of urban containment policies argue that Britain is a small island and we are in danger of 'concreting it over'. But this is a myth: greenbelts in fact cover one and a half times as much land as all our towns and cities put together. Figure 3 shows the boundaries of England's greenbelts with the urbanised areas they surround.

Moreover, our towns and cities are far greener than greenbelts: not only is the biggest land use within them parks and gardens, but they also provide far richer biodiversity than intensively farmed land. Just less than 10% of England is built up,

Figure 3:
Percentages of intensive arable land in England's greenbelts



This map was prepared by Sevrin Waights. Calculations are based on Land Cover Map 2000. Intensive arable land was defined as use categories 4.1, 4.2 and 4.3 and so is a conservative estimate of 'intensively farmed agricultural land'.

but gardens cover nearly half that area (Foresight Land Use Futures Project, 2010). In contrast, the most important land use in greenbelts is intensive arable (74% in Cambridge), which generates negative net environmental benefits (UK National Ecosystem Assessment, 2011).

So the second myth about greenbelts is that they are 'green' or environmentally valuable. They are not because intensive farmland is not. Moreover, there is little or no public access to greenbelt land except where there are viable rights of way. Greenbelts are a handsome subsidy to 'horseyculture' and golf. Since our planning system prevents housing competing, land for golf courses stays very cheap. More of Surrey is now under golf courses – about 2.65% – than has houses on it.

The final myth about greenbelts is that they provide a social or amenity benefit. The reality is that a child in Haringey gets no welfare from the fact that five miles away in Barnet, there are 2,380 hectares of greenbelt land; or in Havering another 6,010 hectares.

What SERC research has shown is that the only value of greenbelts is for those who own houses within them (Gibbons et al, 2011). What greenbelts really seem to be is a very British form of discriminatory

Britain's towns and cities provide far richer biodiversity than the intensively farmed land of the greenbelts

zoning, keeping the urban unwashed out of the Home Counties – and of course helping to turn houses into investment assets instead of places to live.

So the solution to our crisis of housing affordability is not to blame speculators or foreign buyers but to sort ourselves out. We need to allow more land to be released for development while protecting our environmentally and amenity-rich areas more rigorously than we do at present.

Building on greenbelt land would only have to be very modest to provide more than enough land for housing for generations to come: there is enough greenbelt land just within the confines of Greater London – 32,500 hectares – to build 1.6 million houses at average densities. Building there would also reduce pressure to build on playing fields and amenity-rich brownfield sites such as the Hoo Peninsula* and improve the quality of housing.

Moreover, instead of workers in central London having to jump across the greenbelt to find affordable space as they do at present (a Greater London Authority study shows that London's higher skilled workers travel in significant numbers from all over southern England, as far away as Norwich or Bournemouth), they could have easy daily commutes – so reducing carbon emissions.

More land should be released for development while protecting our environmentally and amenity-rich areas

Paul Cheshire is professor emeritus of economic geography at LSE and a SERC researcher.

Further reading

Paul Cheshire, Max Nathan and Henry Overman (2014) *Urban Economics and Urban Policy: Challenging Conventional Policy Wisdom,* Edward Elgar.

Paul Cheshire and Stephen Sheppard (1998) 'Estimating the Demand for Housing, Land and Neighbourhood Characteristics', *Oxford Bulletin of Economics and Statistics* 60(3): 357-82.

Paul Cheshire (2009) 'Urban Containment, Housing Affordability and Price Stability – Irreconcilable Goals', SERC Policy Paper No. 4 (http://www.spatialeconomics.ac.uk/textonly/SERC/publications/download/sercpp004.pdf).

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Steve Gibbons, Susana Mourato and Guilherme Resende (2011) 'The Amenity Value of English Nature: A Hedonic Price Approach', SERC Discussion Paper No. 74 (http://www.spatialeconomics.ac.uk/textonly/SERC/publications/download/sercdp0074.pdf).

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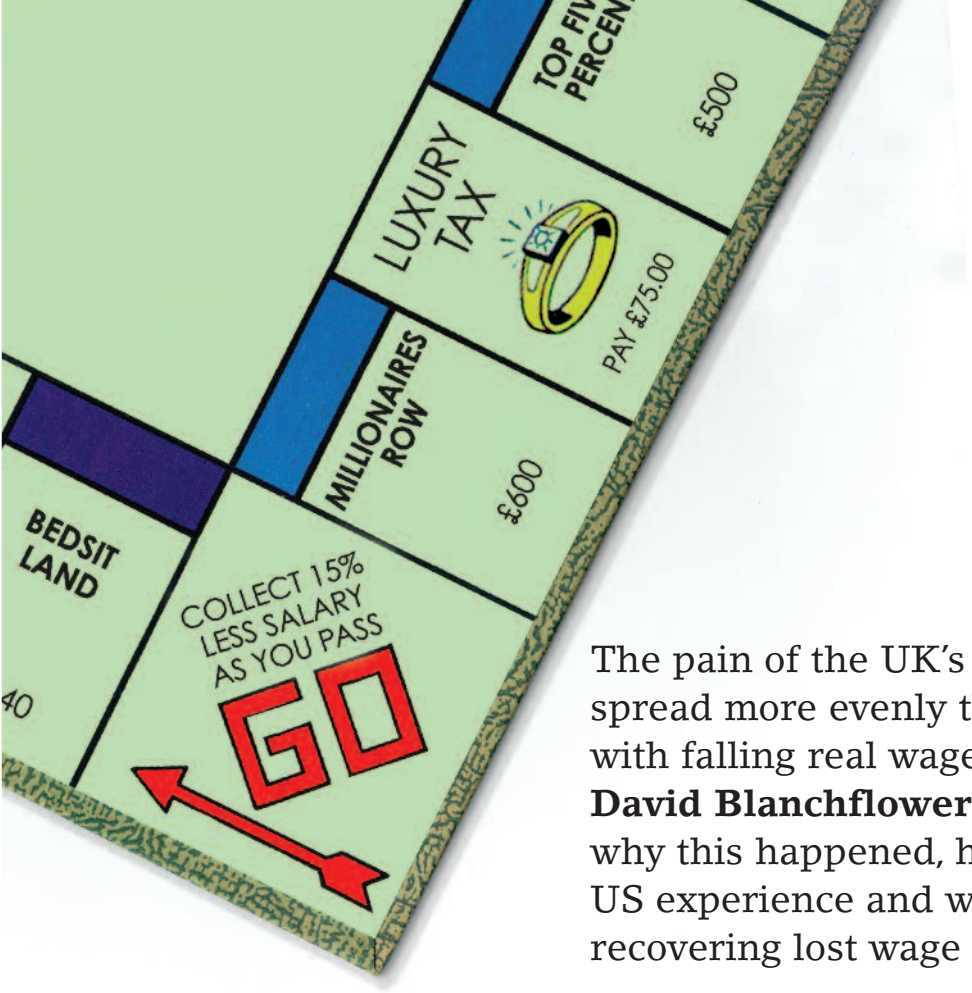


The pain of the UK's Great Recession has been spread more evenly than previous downturns, with falling real wages across the distribution. **David Blanchflower** and **Stephen Machin** ask why this happened, how it compares with the US experience and what the prospects are for recovering lost wage gains.

Falling real wages

There have been unprecedented falls in real wages in the UK since the start of the recession triggered by the financial crisis of 2008. This did not happen in previous economic downturns: median real wage growth slowed down or stalled, but it did not fall. Indeed, in past recessions, almost all workers in both the lowest and highest deciles of the wage distribution experienced growing real wages. It was the unemployed who experienced almost all the pain: they lost their jobs and much of their incomes, and many were unemployed for a long time.

But in the Great Recession and its aftermath, the economic hurt has been spread more evenly, with wages taking the strain this time. The real wages of the typical (median) worker have fallen by around 8-10% – or around 2% a year behind inflation – since 2008. Such falls have occurred across the wage distribution, generating falls in living standards for most people, with the exception of those at the very top.

Some groups have been particularly hard hit, notably the young. Those aged 25 to 29 have seen real wage falls of the order of 12%; for those aged 18 to 24, there have been falls of over 15% (Gregg et al, 2014).

The young have thus been faced with a double whammy; they cannot find jobs and there are still close to a million under the age of 25 who are unemployed, a quarter of whom have been unemployed continuously for at least a year. Even if young people can find a job, it tends to be low paid and frequently has fewer hours than they would like, often involving part-time rather than full-time work (Bell and Blanchflower, 2011).

Why has this happened and what are the prospects for recovering the lost wage gains that workers experienced relative to previous recessions? Some commentators believe that significant real wage growth is coming, and that the prospects are good for a return to the real wage growth patterns seen before the downturn.

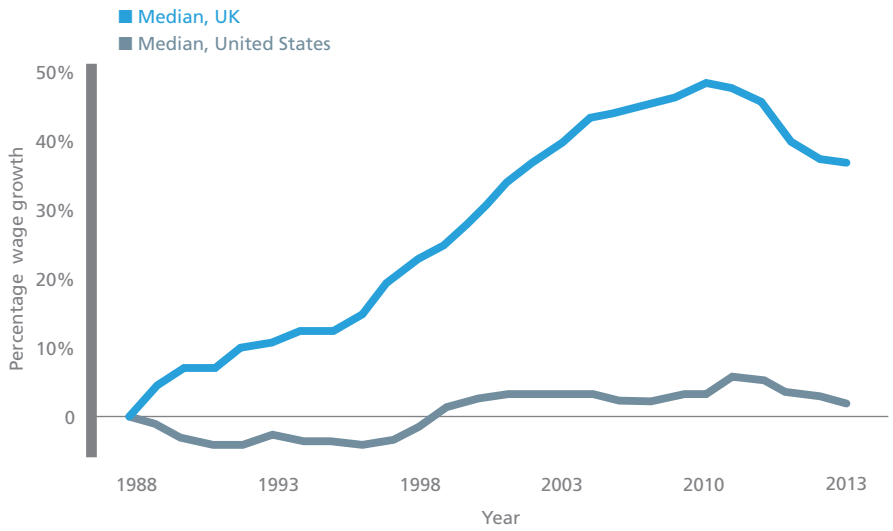
We are more pessimistic. We believe that unless the division of economic growth becomes more fairly shared to offset long-run trends towards greater inequality and unless productivity can be boosted to generate wage gains for all workers, then poor real wage outcomes for typical workers may be here to stay, just as they are in the United States. Realistically, it is hard to see the levels of real wages at the start of the recession being restored for quite some time.

Figure 1 shows what has happened to real wage growth for the median full-time worker in the UK between 1988 and 2013, alongside – as if as a warning sign – the comparable experience of the median full-time US worker.

The UK median worker did relatively well in terms of real wage growth from 1988 up to somewhere around the early

There have been unprecedented falls in UK real wages since the start of the Great Recession

Figure 1:
Real wage growth at the median (fiftieth percentile), full-time weekly wages, UK and United States, 1988-2013



Source: UK data from New Earnings Survey/Annual Survey of Hours and Earnings from Gregg et al, 2014; US numbers from Current Population Survey, Bureau of Labor Statistics.

The prospects of significant wage increases for typical UK workers are bleak

or middle part of the 2000s; but from this point, real wage growth began to slow down and then, in the wake of the 2008 downturn, it fell very rapidly indeed, moving into negative territory. Over the same period, the typical US worker fared rather badly, with real wages remaining below their 1988 levels up to 2000. Aside from a period in the first half of the 2000s and in 2009-10, when some very modest real wage growth occurred, real wage growth at the median was very weak.

Indeed, in 2013, median real weekly earnings were about the same in the United States as they were in 1979. This is probably of concern for the UK's prospects since the United States went through a number of labour market changes some time before similar shifts in the UK. These include greater 'flexibility' and a massive reduction in the extent of union bargaining over wages.

Current policy debates about the role of falling real wages in generating falling living standards (for example, in discussions of the 'squeezed middle' and the 'top 1%') make the question as to whether the falls in real wages can be reversed an extremely important one. So what are the conditions in which real wages could start to grow again and quickly?

A widely held view is that when the economic recovery kicks in seriously, then real wage growth will return. But wage growth forecasts by the Office for Budget Responsibility (OBR) have been remarkably over-optimistic.

Table 1 presents OBR forecasts at six points in time for nominal average earnings growth and real earnings growth (average earnings minus the OBR's forecast of the consumer price index, CPI). Over time, each forecast has been downgraded from the previous forecast, which then proves to be overly optimistic and is downgraded again at the next forecast. In the most recent forecast for December 2013, the OBR is expecting real wage growth of 0.3% for 2014, which is down from the figure of 2.4% estimated in the June 2010 Budget and even as late as March 2012.

In its February 2014 *Inflation Report*, the Bank of England's Monetary Policy Committee (MPC) made similarly over-optimistic forecasts for real wage growth: 'In the central projection, four-quarter growth in real pay turns positive towards the end of 2014, as productivity growth picks up'. This is despite the fact that in the most recent earnings data for February 2014, real average weekly earnings continue to fall at a rate of 0.8% a year. So as ever, a rapid turnaround is expected in real wage growth: but if it hasn't happened for years, why should it happen now?

We have some serious concerns with this relative optimism. First of all, to date, during the start of the recovery, the productivity performance of the economy

Table 1:
Office for Budget Responsibility (OBR) forecasts of average earnings growth

Nominal	**2012**	**2013**	**2014**	**2015**
Budget June 2010	2.3%	3.8%	4.4%	4.4%
November 2011	2.0%	3.1%	4.3%	4.5%
March 2012	2.6%	3.1%	4.3%	4.5%
December 2012	2.7%	2.2%	2.8%	3.7%
March 2013	2.1%	1.4%	2.7%	3.6%
December 2013	2.0%	1.5%	2.6%	3.3%
Real	**2012**	**2013**	**2014**	**2015**
Budget June 2010	0.4%	1.8%	2.4%	2.4%
November 2011	-0.7%	1.0%	2.3%	2.5%
March 2012	-0.2%	1.2%	2.4%	2.5%
December 2012	-0.1%	-0.3%	0.6%	1.7%
March 2013	-0.7%	-1.4%	0.3%	1.5%
December 2013	-0.8%	-1.1%	0.3%	1.2%

Notes: Average earnings = wages and salaries/employment; real earnings calculated as average earnings divided by OBR's forecast of CPI.

has been weak and it has not created room for wage rises, even though it has been good news for employment and unemployment.

Second, because unemployment has not risen by as much as in previous recessions, when and if it falls, there is less scope than in the past for it to boost wage growth through the usual wage curve mechanisms (that is, the reverse of the wage-depressing effects of unemployment in Blanchflower and Oswald, 1994).

Third, and a feature that predated the recession, because of inequality increasing average earnings by more than median earnings, the wages of typical UK workers are no longer keeping up with productivity gains made in the economy. Indeed, as Figure 2 shows, measures of total compensation growth track productivity quite well, but median wage growth has fallen behind since at least the early 2000s.

Median wages seem to have become 'decoupled' from productivity growth because of rising inequality, which means that a growing share of the value from productivity growth is absorbed by pensions and higher salaries for top earners (Bell and Van Reenen, 2014). This again is something that the United States experienced earlier than the UK, and where real wage performance for the typical worker has remained poor for over 30 years.

For significant real wage growth to re-emerge, all of these problems would need to be tackled. Productivity would need a sharp increase of the kind experienced much earlier in the UK recessions of the early 1980s and early 1990s. There are few signs of this happening, and the problem has been magnified by the UK's dismal investment rates.

Even if productivity were to rise rapidly, the tendency for longer-run inequality trends to cause an unequal division of wages from productivity gains to the top (like bankers' bonuses) would need to be addressed. Until that happens or until policy starts to address these issues seriously, it seems that the prospects of significant, rather than modest, real wage increases for typical workers are bleak.

The main drivers of wage pressure come from an intricate blend of 'insider' and 'outsider' forces – people who would like to work and are currently in or out of a job. There is some evidence that unemployment has started to fall (although it rose in the most recent release from the Office for National Statistics, ONS), so outsider pressures pushing down on pay may have weakened a little.

But it is quite clear that the economy is still well below full employment and there is a large amount of slack in the labour market. We see little evidence of widespread skill shortages, which would push up wages; and public sector pay freezes with continuing redundancies continue to push down on workers' bargaining power.

Firms have started to perform better so their ability to raise pay levels may have increased slightly – but so far we see no evidence of any change in their willingness to pay. In line with our discussion of inequality, this does raise a key question: why, if nothing changes, wouldn't they continue to keep any gains to themselves? It stretches credulity to believe that all of a sudden bosses will hand over pay increases to their workers when they have shown no inclination to do so for several years.

David Blanchflower is professor of economics at Dartmouth College and a former member of the MPC and CEP. **Stephen Machin** is CEP's research director, professor of economics at University College London and a member of the Low Pay Commission.

Further reading

Brian Bell and John Van Reenen (2014) 'Bankers and their Bonuses', *Economic Journal* 124: F1-21.

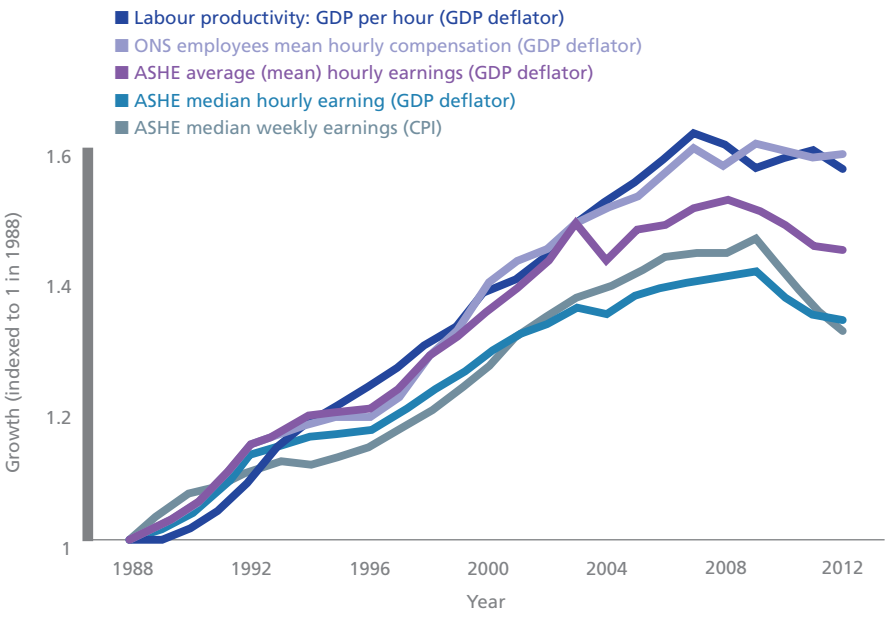
David Bell and David Blanchflower (2011) 'Youth Underemployment in the UK in the Great Recession', *National Institute Economic Review*, January: R1-11.

David Blanchflower and Andrew Oswald (1994) *The Wage Curve*, MIT Press.

Paul Gregg, Stephen Machin and Mariña Fernández-Salgado (2014) 'The Squeeze on Real Wages – And What It Might Take To End It', *National Institute Economic Review*, forthcoming, May 2014.

The long US experience of stagnant real wages might be viewed as a warning sign for the UK

Figure 2:
Labour productivity, annual compensation, mean and median wages, 1988-2012



Source: ONS; New Earnings Survey/Annual Survey of Hours and Earnings; Gregg et al, 2014.

in brief...
Management in America

In 2010, the US Census Bureau conducted the first large-scale survey of management practices in America, gathering data on more than 30,000 manufacturing plants. **Nicholas Bloom** and colleagues find strong links between establishments' performance and the quality of their systems of monitoring, targets and incentives.

Business schools have long stressed the importance of good management, but until recently economists have been reluctant to concur given the paucity of data beyond case studies. But over the last few years, researchers have started to build international management databases, analysis of which makes it possible to explore the role of management practices in driving differences in firm and national performance.

One of the most detailed recent datasets comes from a partnership between CEP, Stanford University and the US Census Bureau, which in 2010 conducted a large management survey of over 30,000 manufacturing establishments. We have conducted the first analysis of the data gathered by the Management and Organizational Practices Survey (MOPS).

The MOPS, which comprised 36 multiple-choice questions about the establishment, took about 20 to 30 minutes to complete. The questions were divided into three parts: management practices (16 questions), organisation (13 questions) and background characteristics (7 questions).

The management practices covered three main sections: performance monitoring, targets and incentives. The monitoring section asked firms about their collection and use of information to monitor and improve the production process – for example, how frequently were performance indicators tracked, with options ranging from *'never'* to *'hourly or more frequently'*.

The targets section asked about the design, integration and realism of production targets – for example, what was the timeframe of production targets, ranging from *'no production targets'* to *'combination of short-term and long-term production targets'*.

The incentives section asked about non-managerial and managerial bonus, promotion and reassignment or dismissal practices – for example, how were managers promoted, with answers ranging from *'mainly on factors other than performance and ability, for example, tenure or family connections'* to *'solely on performance and ability'*.

We aggregate the responses into a single summary measure of structured management scaled from 0 to 1: 0 represents an establishment that selected the bottom category (little structure around performance monitoring, targets and incentives) on all 16 management dimensions; and 1 represents an establishment that selected the top category (an explicit focus on performance monitoring, detailed targets and strong performance incentives) on all 16 dimensions.

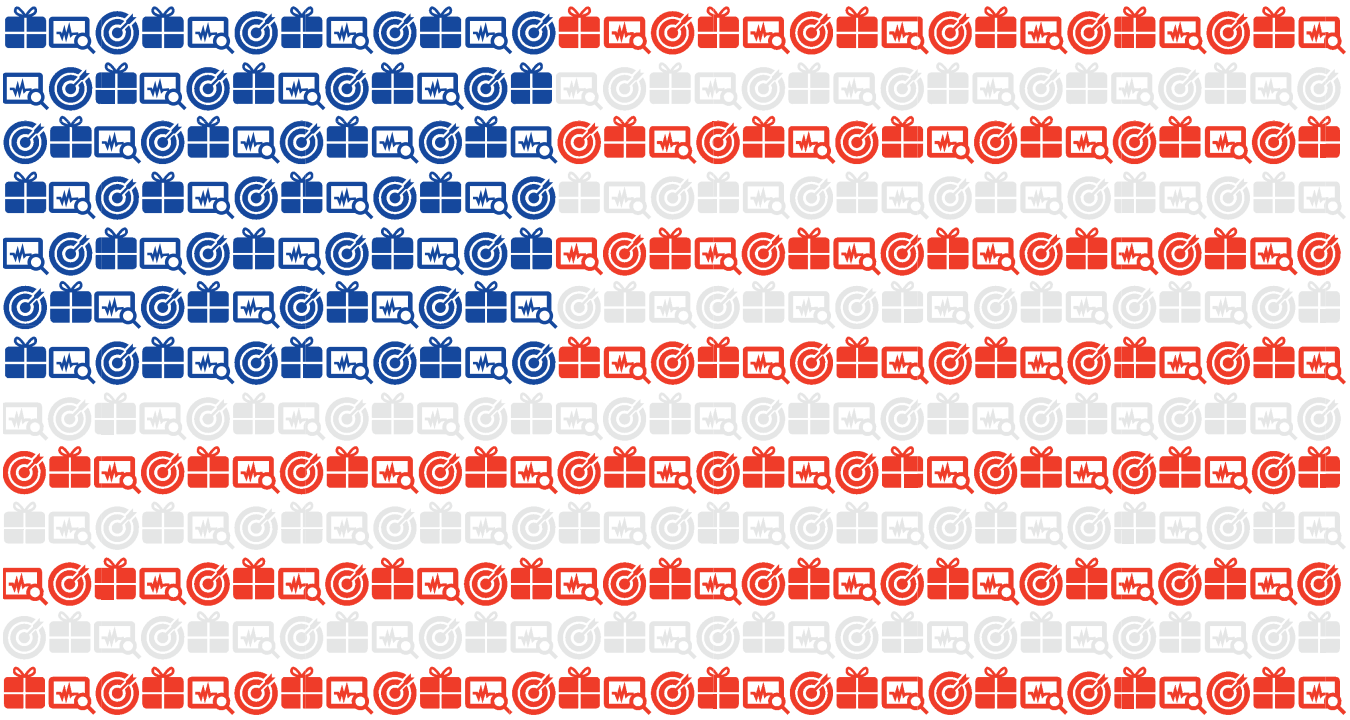
A final set of questions asked about the use of data in decision-making (with response options ranging from *'does not use data'* to *'relies entirely on data'*); and how managers learn about management practices (*'consultants', 'competitors'*, etc).

Our initial analysis of these data shows several striking results. First, structured management practices for performance monitoring, targets and incentives are strongly linked to more intensive use of information technology (IT). Plants using more structured practices have higher levels of investment in IT per worker and more investment in IT overall, and they conduct more sales over electronic networks.

Second, more structured practices are tightly linked to better performance: establishments adopting these practices display greater productivity, profitability, innovation and growth.

Third, the relationship between structured management and performance holds over time within establishments

Effective performance monitoring, targets and incentives are strongly linked to more intensive use of IT



There is huge variation in management in America: higher management scores have a strong relationship with improved productivity and profits

(establishments that adopted more of these practices between 2005 and 2010 also saw improvements in their performance) and across establishments within firms (establishments within the same firm with more structured practices achieve better performance outcomes).

Fourth, more structured practices are more likely to be found in establishments that export, that are larger (or are part of bigger firms) and that have more educated employees. Establishments in America's South and Midwest have more structured management practices on average than those in the Northeast and West. The reasons for this geographical difference are not yet clear, but it may be partly explained by such factors as firm size and industry, and state-specific policies.

Fifth, management practices appear to have become more structured between 2005 and 2010. Breaking down the 16 dimensions into sub-groups, we find that most of the rise in structured management has come in data-driven performance monitoring. This could reflect the increasing use of IT, which makes it easier for establishments to collect, display and analyse performance data.

To investigate the sources of these improvements in management, we examine where the managers learned about new practices. The most common source, reported by over half of the establishments, is a firm's headquarters. This suggests that one explanation for the more structured management of multi-establishment firms is the ability of individual establishments to learn from others within the same firm.

Trade associations and conferences are noted by just under half of establishments as a source of new management practices. Next come consultants, reflecting the role of paid management consultants in helping firms adopt modern practices. And after that come customers and suppliers, which each account for more than a third of respondents' reported sources of new practices.

This article summarises 'IT and Management in America' by Nicholas Bloom, Erik Brynjolfsson, Lucia Foster, Ron Jarmin, Megha Patnaik, Itay Saporta-Eksten and John Van Reenen, CEP Discussion Paper No. 1258 (http://cep.lse.ac.uk/pubs/download/dp1258.pdf).

Full details on MOPS are available here: http://www.managementinamerica.com

Nicholas Bloom is professor of economics at Stanford University and a research associate in CEP's productivity and innovation programme. **Erik Brynjolfsson** is at MIT. **Lucia Foster** and **Ron Jarmin** are at the US Census Bureau. **Megha Patnaik** and **Itay Saporta-Eksten** are at Stanford University. **John Van Reenen** is director of CEP.

in brief...
Does management matter in schools?

CEP's methodology for evaluating the quality of management practices, which is now nearly a decade old, has been applied in a variety of settings, including manufacturing firms, retailers, hospitals and universities. Here, **Renata Lemos** outlines findings about the management of schools in a range of developed and developing countries.

Over the past few years, a growing body of evidence has revealed major disparities in the quality of education across and within countries. In research with my CEP colleagues Nicholas Bloom, Raffaella Sadun and John Van Reenen, we have been investigating differences in managerial and organisational practices across schools and the extent to which these differences may be associated with educational outcomes.

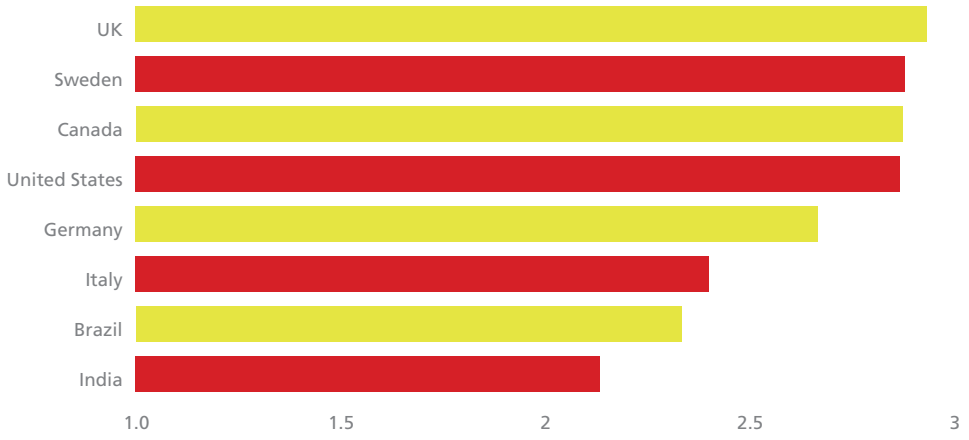
Overall, we find robust evidence that practices vary significantly across countries and are strongly linked to pupil outcomes. We base our analysis on a unique dataset measuring the quality of management practices of over 1,800 schools across eight countries.

Better school management is associated with better pupil achievement

The management survey methodology uses double-blind interviews to collect data on schools' use of operations management, performance monitoring, target setting and talent management in their day-to-day activities. From these interviews, we create a school management index of 1 to 5, which provides us with a comparable measure of the level of adoption of these basic practices across schools.

These data allow us to document a number of new stylised facts. First, we show that the adoption of basic managerial practices in schools offering education to 15-year olds is fairly limited: the average management score across all countries is 2.27. This represents a considerably lower level of adoption of many of the managerial processes included in the index than in manufacturing (where the average management score is 3.01 in firms of between 50 and 5,000 employees in these eight countries). It is slightly lower than in healthcare (where the average management score is 2.43 in general hospitals offering acute care plus cardiology or orthopaedics procedures in these eight countries).

Figure 1:
School management score index by country



Note: The management index is the simple average across all questions for a school; the country average simply averages this management score across all schools.

Second, in the school management index, the UK, Sweden, Canada and the United States are at the top of the ranking, closely followed by Germany, while Italy, Brazil and India lie at the bottom. The differences in management across countries are on average more salient in education than they are in other sectors: 55% of the variance in the school management index can be attributed to variations across countries, compared with 13% in manufacturing and 42% in healthcare across the same set of countries. This finding suggests that differences in the institutional environment may have important effects on the way that schools are managed.

Third, looking at schools within countries, we show that an increase in the average management index is associated with an increase in pupil achievement. Moving from a school in the bottom quarter of the management index distribution to a school in the top quarter, which is approximately one point in the management index, is associated with an increase in school performance of approximately 15%.

In view of the larger body of research on the effects of educational inputs on pupil achievement, we find that performance associations for management quality are between two to three times larger than for competition and teacher quality and over ten times larger than for a measured input such as class size. Although the cross-sectional nature of the data does not allow us to investigate the direction of causality behind these associations, the result reassures us that our management index is a meaningful tool to explore differences in the quality of education across and within countries.

Fourth, there are large differences in the quality of management adopted by schools both within countries and within regions in countries. We find that school ownership and governance is a key factor associated with differences in management practices.

In particular, we find that autonomous state schools (that is, organisations that are publicly funded but governed by school-specific regulations) have higher scores on the management index relative to regular state schools, which are publicly funded and managed according to region-wide guidelines, and private schools. Autonomous state schools include 'escolas de referência' in Brazil, separate schools in Canada, 'private ersatzschulen' in Germany, private aided schools in India, friskolor in Sweden, the UK's academies, foundation schools and voluntary aided schools, and charter and magnet schools in the United States.

Fifth, the difference between autonomous state schools compared with regular state schools and private schools does not seem to reflect observable differences in the composition of the pupil body, school and regional characteristics or basic demographics of the head teachers or principals, such as their tenure and gender. In contrast, the quality of school management appears to be related to specific traits of the principals.

In particular, principals in autonomous state schools are more likely to have developed and communicated a long-term strategy for the school and to be subject to stronger governance, making them more accountable for the delivery of pupils' outcomes relative to the principals of regular state schools and private schools. Taking these leadership traits into account more than halves the managerial gap between autonomous state schools and regular state and private schools in the OECD.

The quality of school management is related to school ownership, governance and the leadership traits of head teachers

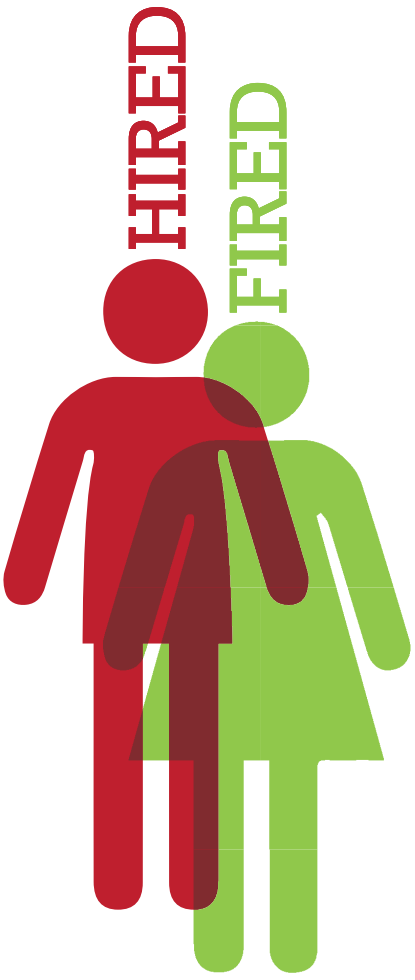
Renata Lemos is a research project leader in CEP's productivity and innovation programme.

Can differences in men and women's pay and employment opportunities be explained by discrimination or by differences in their preferences or productivity? **Ghazala Azmat** and **Barbara Petrongolo** explore what has been learned from economic experiments about the continued prevalence of gender gaps in the labour market.

Gender and the labour market: evidence from experiments

Women have made major inroads in labour markets throughout the past century. As a result, there has been a clear convergence in their levels of human capital investment and their employment prospects and outcomes relative to men. But while the gender gap in education has closed – and even reversed – in most rich countries, there remain considerable gender differences in pay and employment levels, as well as in the types of activities that men and women perform in the labour market.

Labour economists have long tried to understand these differences and three key channels have been identified as potential explanations: labour market discrimination; gender differences in preferences; and productivity. But analysing these hypotheses with traditional tools and data in economics is not straightforward. The study of discrimination, for example, is often complicated by the presence of unmeasured confounding factors, while extracting clean information on people's psychological traits from naturally-occurring data is often difficult, if not impossible.



By providing data explicitly suited to addressing the questions of interest and allowing tight control over the environment, the experimental approach provides a valuable source of evidence on these and other gender issues.

Early economic work on discrimination extensively used the traditional approach of regression analysis on observational data. But increased awareness of the limitations of this approach has gradually shifted the emphasis of empirical work on this topic towards field experiments such as audit and correspondence studies, which aim to compare outcomes in the same job for two individuals who are identical in all respects other than gender.

These experiments are widely viewed as the most compelling way of testing for discrimination. Audit studies compare interview call-back rates and/or job offer rates on a given job opening for pairs of applicants – one male and one female – with identical resumes. Correspondence studies compare

There is evidence of significant discrimination against women in high-status or male-dominated jobs

call-back rates for fictitious applications instead of real-life auditors.

While it is not trivial to extrapolate a clear consensus view from experimental research on gender discrimination, the conclusions of this body of work can be broadly summarised as follows: there is evidence of significant discrimination against women in high-status or male-dominated jobs as well as discrimination against men in female-dominated jobs.

But compared with the regression approach, the experimental approach tends to find far more limited evidence of discrimination against women in the marketplace. Different results from the two approaches may be driven by systematic gaps in unobservables in favour of men, which would explain the unexplained gap in wages.

Despite recent advances, several aspects of discrimination have yet to be understood. In particular, disentangling the nature of discrimination has proved to be challenging, namely whether employers have a 'taste for discrimination', or whether they use gender to extrapolate a signal of unobserved components of productivity. Moreover, to date, experiments have offered little insight into on-the-job discrimination, and on how anticipated discrimination might feed back into individuals' choices.

The traditional economic approach to understanding gender differences in labour market outcomes has been to focus on demand-side explanations, such as employer discrimination, as well as on supply-side constraints that are based on educational differences or family responsibility.

More recently, economists have considered alternative supply-side explanations for gender differences in outcomes. For example, potential gender differences in psychological attributes – including preferences for risk and competition, as well as concerns about other people – might offer insights into gender gaps. Experiments offer a useful methodology for studying behaviour and strategic interaction in a controlled environment – and they can be adapted to elicit gender differences in preferences in spheres potentially associated with labour market success.

Occupational and industry segregation of men and women is one of the leading components of gender gaps in earnings – and these have been widely documented. As jobs in different sectors offer different arrays of job security, earnings stability and working conditions, systematic gender differences in preferences for risk and competition have the potential to shape gaps in earnings through job sorting behaviour.

Lab experiments find significant gender differences in attitudes towards risk and competition: for example, men are more tolerant of risk than women, they thrive in competitive environments and they have a greater tendency than women to self-select into these environments.

Another hypothesis for why earnings of men and women differ, even on identical jobs, is that men and women may conduct salary negotiations differently. More generally, women may take account of a broader set of preferences than those that simply maximise their own monetary payoffs.

The experimental results on gender differences in negotiation and social preferences are somewhat mixed and depend strongly on context. For example, women's performance is more strongly affected by the gender of whom they work with or whom they compete against than men's performance.

While evidence from various experimental settings suggests that women and men may differ in traits that are potentially related to labour market success, the causes – nature or nurture – and the economic consequences of such differences are not entirely understood. The next stage is to understand how findings from the lab on psychological attributes and preferences would map onto the labour market and whether there is scope for policy. From a policy perspective, the prescriptions will differ depending on how traits are formed and how important they are in influencing outcomes.

A natural progression from the study of individual preferences has been to understand their role in group settings. If different psychological traits lead men and women to make different choices in similar contexts, the gender composition of teams becomes a relevant factor in collective decision-making. Higher female participation in the labour market has implied changing workplace demographics and more gender-diverse teams. In high-profile professions, such as politics or the

Lab experiments find significant gender differences in attitudes towards risk and competition

corporate sector, these changes have been eased by the introduction of explicit gender quotas in a number of countries.

Despite a large body of lab evidence on individual preferences, experimental studies of gender and preferences at the team level is relatively scarce. One of the main problems with studying gender and groups is that groups are typically formed endogenously. Recent reforms that mandate certain levels of female representation on boards of directors offer a valuable, quasi-experimental setting to study the gender composition of teams and performance.

The first country to implement gender quota laws was Norway in 2003, followed by Spain, Finland, Iceland and France. One study of the impact of female presence on boards on firm performance exploits the Norwegian reform, which requires listed companies to achieve 40% female board representation within two years. The research finds important effects of female board representation, notably that the constraints imposed by the quota led to a decline in stock prices and operating profits.

While quota reforms and other field and lab experiments offer valuable insights into the consequences of gender diversity, research on this issue is still very limited, not least because it is restricted to a small and select group of women. Quota policies, as well as business games among MBA students, focus attention on women who may not be fully representative of the female workforce. The representation of women in decision-making at lower levels of responsibility can thus help to form a broader picture of the impact of gender diversity and attenuate the stark selection of women at the top.

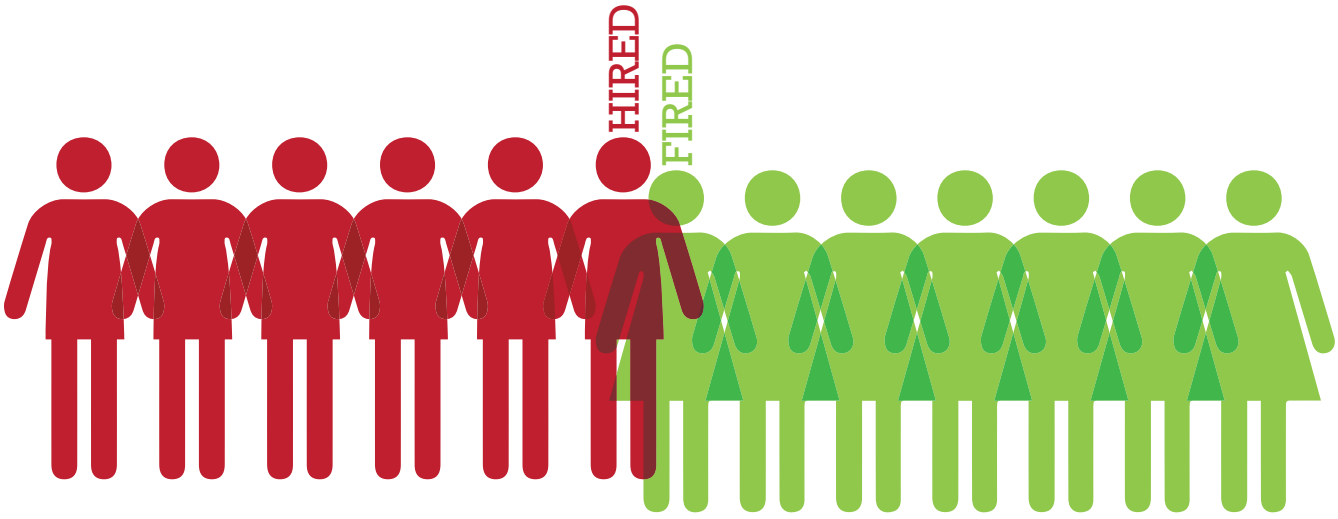
Experiments offer a novel and useful methodology that is being used widely in almost all areas of economics. In gender economics, the experimental approach offers a way to answer questions previously believed to be unanswerable because of data limitations, as well as new techniques to identify mechanisms and results in older topics traditionally studied by labour economists.

Yet despite recent advances, several important aspects of gender differences in labour market success have to date been only partially explored experimentally. There is clear scope for further research in several directions concerning the nature of gender discrimination, the labour market consequences of gender differences in preferences established in the lab, and the sources of such differences.

This article summarises 'Gender and the Labor Market: What Have We Learned from Field and Lab Experiments?' by Ghazala Azmat and Barbara Petrongolo, CEP Occasional Paper No. 40 (http://cep.lse.ac.uk/pubs/download/occasional/op040.pdf).

CEP research associates **Ghazala Azmat** and **Barbara Petrongolo** are in the economics department at Queen Mary, University of London.

We need to understand the causes and labour market consequences of the gender differences in psychological traits detected in the lab



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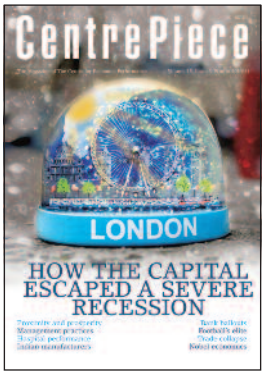
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