

# Centre Piece

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NEETs

Teachers' pay

Postgraduates

Football and crime

Process innovation

Unequal Britain

French schools

Jobs in Europe



Policy for innovation  
and growth

# CentrePiece



THE LONDON SCHOOL  
OF ECONOMICS AND  
POLITICAL SCIENCE ■

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CEP director, John Van Reenen  
CEP research director, Stephen Machin

Editor, Romesh Vaitilingam  
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## Editorial

Policy-makers across Europe and the United States want growth and jobs, desperately seeking measures to reinvigorate their flagging recoveries. Researchers at the Centre for Economic Performance (CEP) have spent many years thinking about the fundamental question that underlies that search – what drives productivity growth?

The last issue of *CentrePiece* described the substantial body of CEP research evidence on the important role of competition in raising productivity. One way it does that is by promoting innovation: in an effort to get ahead of their competitors, firms come up with new ideas for products – think of Steve Jobs' Apple. Firms also find better ways of making their existing products: in this issue, Tim Leunig and Joachim Voth show the huge growth benefits of such 'process innovation' in the cotton and car industries.

Competition policy can have a significant impact in support of

innovation and growth, but public policy can also influence innovation more directly. In our cover story, CEP's director John Van Reenen outlines the Centre's work on fiscal incentives for business spending on research and development (R&D). The evidence indicates that R&D tax credits can be highly effective in encouraging innovation.

The skills of the workforce are another important contributor to growth. Elsewhere in the magazine are articles on the two ends of Britain's distribution of what economists call 'human capital'. Hilary Steedman discusses the NEETs – young people, often with few qualifications, who are 'not in education, employment or training'. And CEP's research director Stephen Machin describes the growing trend of students staying in university after graduation so as to acquire further qualifications.

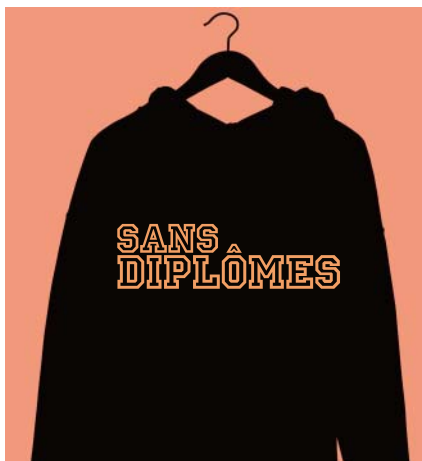
The boom in postgraduate education is increasing inequality among people

who have degrees as well as more broadly in the labour market. Henry Overman and Steve Gibbons also focus on 'unequal Britain', examining the reality of regional disparities. Their critique of the foundations of successive governments' urban and regional policies suggests that a great deal of time and public money has been wasted on policies that do little either to reduce inequality or promote growth.

Finally, CEP's Nobel laureate Chris Pissarides compares the records of Europe and the United States on job creation, especially in the potential growth sectors of healthcare, education and business services. His findings are yet another illustration of the powerful impact of public policy on employment. The key is to figure out which policies will retard growth and which policies will boost growth.

Romesh Vaitilingam, Editor  
romesh@vaitilingam.com

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### The future of work in Europe

UNEXPECTED ITEM  
IN THE BAGGING AREA

In the last *CentrePiece*, **John Van Reenen** stressed the importance of competition and labour market flexibility for productivity growth. His latest in CEP's 'big ideas' series describes the impact of research on how policy-makers can influence innovation more directly – through tax credits for business spending on research and development.

# Big ideas

## Innovation policy



# Big ideas

**I**n the wake of the Great Recession, the UK is hardly alone in looking for sources of economic growth. Economists and many other commentators agree that technological innovation must be at the heart of long-run growth. It is also widely understood that left to itself the market is unlikely to provide enough incentives for innovation.

This 'market failure' is primarily because only a small proportion of the benefits of invention are captured by the firm or individual who spends money and time on research. Most of the benefits of invention 'spill over' to other firms who can copy the new idea without having to pay the upfront research costs. For example, it took a lot of effort to invent the automobile and the personal computer – but once they were invented, imitators crowded in.

This means that there will be too little spent on research and development (R&D) from the point of view of society as a whole. Intellectual property rights, such as patents and copyright, were designed to protect inventors and increase their incentive to innovate. But in most cases patents can be designed around so they do not fully eliminate the market failure.

So can there be a role for public policy in stimulating innovation? Is it driven by fundamental factors, such as culture and luck, which are beyond the ability of governments to influence except in the most minor ways?

CEP research has challenged the fatalistic attitude that innovation is not amenable to government action. One direct way to influence innovation is through the tax system, in particular by offering a tax break for business spending on R&D.

I started working on fiscal incentives for R&D in the mid-1990s after being shocked to discover that the share of UK national income spent on business R&D had declined since the late 1970s. In just about every other developed country, it had been rising.

The United States introduced an R&D tax credit in 1981 under Ronald Reagan, but the UK Treasury had always resisted the idea, arguing that firms were unlikely to increase their R&D efforts significantly in response. Evaluations of the US system seemed to show, however, that after a few teething problems, American firms had responded to these tax incentives.

Working with Bronwyn Hall of the University of California at Berkeley, our review of all the existing evidence showed that when researchers used good quality firm-level data and tracked companies over time, they found that tax credits stimulated significant American R&D spending (Hall and Van Reenen, 2000). Were UK firms likely to be so much more lethargic than their counterparts across the Atlantic?

At that time, international evidence on the effectiveness of innovation tax policy was almost non-existent. No one had even collected systematic information on the tax benefits to R&D across

countries over time – not the International Monetary Fund, the OECD, the World Bank or the United Nations.

Together with Rachel Griffith (now deputy research director of the Institute for Fiscal Studies), we put together a team and embarked on a major effort to measure the impact of the tax system on the costs of R&D capital across all the major economies over 20 years. A downside of this was that we had to wade through many dusty tomes of rather tedious tax and accounting rules.

Once we had accomplished that arduous task, we were able to show that there had been a major shift towards R&D tax credits and away from direct subsidies. One of the advantages of tax credits over the more traditional grants was that the government could simply set the rules and it did not have to get involved with 'picking winners'.

More importantly perhaps, we combined the tax data with information on national R&D and showed that tax credits had a large effect on increasing business R&D. Although a 10% reduction in the tax costs only increased private sector R&D spending by about 1% in the first year after an R&D tax credit was introduced, in the long run R&D volumes rose by a full 10% (Bloom et al, 2002).

So far, so good. But what we care about is not R&D per se, as this is just an input. We care about economic growth, which will increase wages and consumption. To tackle this problem, we had to develop a new model of

A strong R&D base  
helps a country to imitate  
as well as innovate

# Big ideas

## The UK's R&D intensity stopped declining in the mid-2000s, which coincides with the bedding down of the R&D tax credit

'endogenous growth' that took account of not just the obvious effect of R&D on innovation but also the less obvious 'second face' of R&D, which fosters diffusion of existing innovations.

Having more scientists helps the UK catch up with leading-edge countries because they can read and understand new ideas, which can then be 'absorbed' more effectively in the UK economy. For a country like the UK, which is sadly often far from the technological frontier, this is very important. It means that just sitting back and letting other countries – the United States, Germany, Japan and increasingly China – do all the innovation is unlikely to be the right strategy.

A strong R&D base helps a country to imitate as well as innovate. In a speech on the science budget last year, David Willetts, the universities and science minister, quoted CEP's research in this area:

'Some 95% of scientific research is conducted outside the UK. We need to be able to apply it here – and, in advanced scientific fields, it is often necessary to conduct leading-edge research in order to understand, assimilate and exploit the leading-edge research of others.'

'It is this absorptive capacity which is crucial. Indeed, Griffiths, Redding and Van Reenen have shown that higher domestic business R&D spend also leads to greater productivity being generated at home from foreign R&D spend as well. And there are powerful feedback mechanisms on top of this – foreign companies cite the quality of the public research base as one of the main reasons for locating their own internationally mobile R&D here.'

In a series of studies with Princeton University's Steve Redding (who was director of CEP's globalisation programme from 2005 to 2010), we created an econometric model for the whole OECD, which showed how R&D stimulated

productivity growth through both innovation and imitation (Griffith et al, 2004). We combined this with our R&D tax information to simulate the effects of introducing an R&D tax credit in the UK.

We found that the benefits of an R&D tax credit would easily outweigh the costs, which implied that it could be a successful policy (Griffith et al, 1999). But we also cautioned that, as ever, the devil was in the detail: making the tax complicated could unwind its effects.

Our work appeared in academic journals, policy pamphlets and the printed and broadcast media. It was also picked up by Dan Corry (who was to become head of the No. 10 policy unit during Gordon Brown's term of office as prime minister) when he was at the Institute for Public Policy Research. The proposals became part of Labour's 1997 manifesto, which ushered in the first ever R&D tax credit in the UK in 2001 – initially just for small and medium-sized enterprises, but later extended to firms of all sizes.

In an illustration of the close connection between academic ideas and policy-making, our co-author on the tax credit work was Nick Bloom, who was then my PhD student. After graduating, he was seconded to the Treasury to help them introduce the tax credit and its extension to large firms (in 2003). Nick led CEP's research programme on productivity between 2003 and 2006 and pushed forward the Centre's continuing investigations of the ways in which policy can be used to stimulate innovation.

The R&D tax credit is under review by the current government, but it looks like it will remain a permanent fixture of the fiscal scene. The UK's R&D intensity stopped declining in the mid-2000s, which coincides with the bedding down of the R&D tax credit. This could be



# The 'patent box' policy will waste around £1 billion a year at a time when the country can ill afford it

coincidence and more rigorous evaluations of the effects of the fiscal incentives are needed. Nevertheless, the initial findings are encouraging and our work in progress suggests that US R&D tax credits raise firms' market values, productivity and innovation (Bloom et al, 2010).

The R&D tax credit story is a useful parable of the interaction of fundamental economic research with policy development and implementation. It contrasts with the 'patent box', a poorly targeted policy that consists of tax benefits to the royalties on patents: such rewards create few 'spillovers' as the research is already done. The patent box policy was proposed in the dying days of the Labour government and it will waste around £1 billion a year at a time when the country can ill afford it. While this looks like being another of the few Labour policies that the government is continuing, in this case the continuity is unfortunate.



## Big ideas

**John Van Reenen** is director of CEP.

### Further reading

Nicholas Bloom, Rachel Griffith and John Van Reenen (2002) 'Do R&D Tax Credits Work?', *Journal of Public Economics* 85: 1-31 (earlier version available here: [http://cep.lse.ac.uk/textonly/people/vanreenen/papers/gvrb15\\_wp.pdf](http://cep.lse.ac.uk/textonly/people/vanreenen/papers/gvrb15_wp.pdf)).

Nicholas Bloom, Mark Schankerman and John Van Reenen (2010) 'Identifying Technological Spillovers and Product Market Rivalry', CEP Discussion Paper No. 675 (<http://cep.lse.ac.uk/pubs/download/dp0675.pdf>)

Rachel Griffith, Stephen Redding and John Van Reenen (1999) 'Bridging the Productivity Gap', *CentrePiece* 4(3): 14-19.

Rachel Griffith, Stephen Redding and John Van Reenen (2004) 'Mapping the Two Faces of R&D: Productivity Growth in a Panel of OECD Industries', *Review of Economics and Statistics* 86(4): 883-95 (earlier version available here: <http://cep.lse.ac.uk/textonly/people/vanreenen/papers/wp0002.pdf>).

Bronwyn Hall and John Van Reenen (2000) 'Fiscal Incentives for R&D: A New Review of the Evidence', *Research Policy* 29: 449-69 (earlier version available here: <http://cep.lse.ac.uk/textonly/people/vanreenen/papers/w7098.pdf>).

in brief...

# Cotton and cars: the huge gains from process innovation

New inventions are good for economic growth, but equally important are improvements in the way we make things – what’s known as process innovation. **Tim Leunig** and **Joachim Voith** measure the impact of two such innovations – mechanical cotton spinning and the motorcar assembly line – on the world’s material wellbeing.

In material terms at least, life today is much better than it was in the past for almost everyone living in a developed nation. Think of all the items we have now that we did not have then – from the internet and mobile phones to more trivial items such as apple cinnamon cheerios, a favourite American breakfast cereal.

These ‘new goods’ enrich our lives, and economists have worked out just how much they are worth. They have found that the internet is worth 2-3% of GDP, the mobile phone 0.5-1% and even apple cinnamon cheerios raised the welfare of Americans by 0.002% of GDP. Some people really didn’t like their previous breakfast cereal.

There are two stages in making a new good valuable to society. First, it has to be invented, and we rightly celebrate inventors throughout the ages. But inventions also have to be adopted, and that means that they have to offer good value to consumers. The people who come up with ways of producing things more cheaply are also important in making us better off.

We have investigated the scale of two such innovations: mechanical cotton spinning and the motorcar assembly line. Both led to sensational price declines and both transformed what had been luxury items for upper class consumption – Indian calicoes and motorcars – into items of everyday consumption for a significant part of the population. Workers on Ford’s Model T assembly line could afford the cars they made; cotton spinners could wear cotton shirts.

Henry Ford did not invent the motorcar. Nor was his Model T a particularly good motorcar. Ford was not even the first to use a moving assembly line. But he was the first to ‘mass produce’ a car, a phrase he was also the first to use.

The effects were impressive: the time taken to assemble a Ford chassis fell from just under 12.5 hours in the spring of 1913 to 93 minutes a year later. Greater efficiency led to big falls in price: the Model T cost \$950 in 1909 and \$360 in 1916, a fall in real terms of more than two thirds. Ford realised his aim of building a car ‘so low in price that no man making a good salary will be unable to own one’.

Between 1908 and 1927 Ford sold a total of 15 million Model Ts. It was so ubiquitous that in his 1945 novel *Cannery Row*, John Steinbeck wrote that ‘Most of the babies of the period were conceived in Model T Fords and not a few were born in them.’ Ford also forced other car firms to follow suit, so that between 1908 and 1923 the average price of a car fell from \$2,126 to \$317 in 1908 terms. At the same time, annual sales rose from just 64,000 to 3.6 million.

One way of working out what Ford’s process innovation was worth to the American people is to calculate how much extra they would have had to pay to buy the cars they did in fact buy, at the price prevailing prior to Ford’s innovation. This measure is known as ‘social savings’. On that basis, Ford’s value to the American people was a staggering 14.7% of GDP.

Of course, we know that not everyone who bought a car at \$317 in 1923 would have been willing to pay \$2,126 for it. We can estimate the shape of the demand curve, and on that basis Ford’s innovation was worth around 1.8% of GDP. Although much smaller than our earlier number, it still means that the average value of a Ford car to consumers was around twice the price they had to pay. Ford made himself rich and created lots of jobs, but most of the benefits of his innovation went to the people who bought his cars.

Mechanising the production processes of car and cotton was as valuable as inventing the internet





Her habit of measuring time in terms of dollars gives the woman in business keen insight into the true value of a Ford closed car for her personal use. This car enables her to conserve minutes, to expedite her affairs, to widen the scope of her activities. Its low first cost, long life and inexpensive operation and upkeep convince her that it is a sound investment value. And it is such a pleasant car to drive that it transforms the business call which might be an interruption into an enjoyable episode of her busy day.

Henry Ford made himself rich, but most of the benefits of his innovation went to the people who bought his cars

product that has been invented that has had a bigger effect on welfare, as quickly, as these two improvements in the way in which we make things.

It is sometimes said – usually wrongly – that everything worth inventing has been invented. But even if that were the case, economic growth could and would continue. Innovators would strive successfully, and to great effect, to produce existing things more cheaply. This would raise our standard of living, allowing us to buy more of the goods that already exist or to spend less time at work while having the same material standard of living.

Those who make existing goods cheaper should be celebrated just as much as those who invent them in the first place. Both are crucial to understanding why we can, today, live so much better than we were able to in the past.

People who make existing goods cheaper should be celebrated just as much as those who invent them in the first place

TUDOR SEDAN, \$590      FORDOR SEDAN, \$685      COUPE, \$525      (All prices f. o. b. Detroit)



The same is true of mechanising cotton spinning in the Industrial Revolution. Again, the fall in price was spectacular. Cotton yarn that had sold for 107 pence a pound in 1784 sold for just under 13 pence in 1820.

The social savings from mechanising cotton yarn production were of a similar order of magnitude to those of mechanising car production – 17.6% of British GDP. Of that, 7.5% went to British consumers, while the other 10.1% went to the people around the globe who were now able to buy cotton goods more cheaply.

The consumer surplus estimate, this time simply for the cotton used by British people, was around 2.6%, again a substantial number. As the famous historian AJP Taylor, himself born to a cotton family, once remarked, 'Every piece of cotton cloth is going to make someone warmer or cleaner or more comfortable'.

These two process innovations each produced gains for consumers that were, even when estimated conservatively, equal to the expenditure on them. Furthermore, the gains took relatively little time to be realised.

Improving the production processes of these two existing goods was as valuable in terms of consumer welfare as inventing the internet, and much more valuable than inventing mobile phones. Indeed, it is hard to imagine any

This article summarises 'Spinning Welfare: The Gains from Process Innovation in Cotton and Car Production' by Tim Leunig and Joachim Voth, CEP Discussion Paper No. 1050 (<http://cep.lse.ac.uk/pubs/download/dp1050.pdf>).

**Tim Leunig** is reader in economic history at LSE and an associate in CEP's research programme on globalisation. **Joachim Voth** is ICREA research professor in the economics department at Universitat Pompeu Fabra, Barcelona.

The heavy police presence at football matches in England has reduced hooliganism in the stadium – but at what cost in terms of both policing budgets and under-protected places elsewhere in the neighbourhood? **Olivier Marie** examines the multiple effects of football matches on crime.

# Football matches: the effects on crime



## During home matches, opportunistic offenders in under-protected local areas commit more property crimes

In the 1980s, football in England became infamous for the aggressive behaviour of some of its fans, when hooliganism tainted the 'beautiful game'. To combat this affliction, security at stadiums was greatly enhanced and the policing of matches drastically increased. As a result, crowd violence had significantly subsided by the 1990s and the hooligan stigma has all but disappeared from English football today.

Still, the occasional scuffle is inevitable. While the police are now mostly able to prevent these from degenerating, the physical proximity of opposing fans has the potential to result in violent crimes during home games. This possibility – which I call the 'concentration effect' – is the first channel through which football matches can have an effect on crime.

In recent years, a different public safety debate has emerged, which is concerned with the very high costs of policing matches. These costs are only partially covered by the football clubs themselves. In 2009, during a discussion of the costs of policing football by the House of Commons Home Affairs Committee, David Winnick MP noted additional potential costs:

'If I were involved in criminality of a more sophisticated kind... would I not work on the assumption that the police will be fully occupied in a particular city – it will not be difficult to find out when these premier games are being played – and I could go about my unlawful business?'

This question suggests the second channel through which matches can affect

crime – the 'displacement effect'. There may be increases in violent crime and property crime away from stadiums because of the displacement of police personnel assigned to match security during a home game.

A third possible effect of football on crime may stem from the 'self-incapacitation' of some potential offenders. This supposes that among the thousands of fans attending or following a game, a not insignificant number of them would have been criminally active if they had not been at the match. Self-incapacitation could therefore lead to decreases in violent crime and property crimes during both home and away games, especially in neighbourhoods where a high proportion of the population supports the local team.

Football matches may thus affect local crime rates through concentration, displacement and self-incapacitation – the directions of the three potential effects are described in Figure 1. For researchers, the difficulty is to disentangle the impact of each of these effects as they occur simultaneously. One solution is to consider how they influence property crime and violent crime separately during home and away games.

For example, to identify the self-incapacitation effect, we simply need to consider changes in local crime rates in a football team's neighbourhood during away games. The displacement effect can then be measured as the difference in crime rates during home and away games for property offences. The concentration

effect only affects violent crime during home games but will be hard to measure precisely. We would still be able to attribute increases in violent offences during home games as stemming from a mix of the displacement and concentration effects.

To obtain measures of these effects, we use the Metropolitan Crime Statistics System, high frequency local area crime data available for London for 1994-97. The system contains information on the time, location and type of offence for all crimes recorded by the police in the capital during this period. The data are aggregated at the level of the 32 boroughs in London into four six-hour windows for property and violent crimes.

This is matched to detailed game information for nine major football teams with grounds in seven different London boroughs (in parenthesis): Arsenal (Islington), Charlton Athletic (Greenwich),

Figure 1:  
Concentration, displacement and incapacitation effects on property crime and violent crime during home and away games

	Property crime		Violent crime	
	Home	Away	Home	Away
Concentration	▶	▶	△	▶
Displacement	△	▶	△	▶
Self-incapacitation	▽	▽	▽	▽

**Note:** Upward and downward pointing arrows represent positive and negative effects through each of the three channels – concentration, displacement and self-incapacitation – through which home or away sporting events may affect local property crime and violent crime. Flat arrows suggest no expected effect.

Chelsea (Hammersmith and Fulham), Crystal Palace (Croydon), Millwall (Lewisham), QPR (Hammersmith and Fulham), Tottenham Hotspur (Haringey), West Ham United (Newham) and Wimbledon (Croydon).

For each match, we know the kick-off time, the attendance, the type of game (league or cup), the result including goal difference, the number of red and yellow cards issued and whether it is a local derby (that is, when London teams play each other). There are 571 home and 576 away matches in the period for which the crime data are available.

To identify a match effect on local criminal activity, we exploit the variation in location and timing of both home and away games. We focus on the impact of large variations in attendance, controlling for weather conditions and whether the game is played on a holiday. We also net out the possible influence of other matches taking place at the same time, the distance of each borough to the stadium hosting a home game and the distance of each away match.

Our results suggest that the level of property crime falls by roughly 3% for every extra 10,000 supporters attending an away game. In accordance with our conceptual framework (Figure 1), we interpret the fall in property offences during away matches as a pure self-incapacitation effect.

But during a home game, property crime rises by 4% for every extra 10,000 supporters. This suggests that there is an important police displacement effect as opportunistic offenders in the under-protected areas of a borough take advantage of the smaller probability of detection to commit property crimes.

We find no measurable impact on violent crime in the local community except during a local derby. This suggests some effect of concentration during matches that are reputedly the ones with the highest levels of animosity between rival fans.

The overall conclusion from our research is that the displacement of police forces during football matches increases property crime by almost 7% for every extra 10,000 fans attending a game. This is in line with a growing body of evidence showing that police presence has an important effect on reducing crime, including CEP research on the impact

on crime of extra policing following the 7/7 terror attacks in London (Draca et al, 2008).

The research also contributes to the debate about the impact of policing of private sporting events and the cost in terms of the local community's wellbeing. This is especially relevant after August's riots and looting in London, which raised questions about the ability of an already stretched police force to maintain law and order when the capital hosts the Olympic Games next year.

This article summarises 'Police and Thieves in the Stadium: Measuring the (Multiple) Effects of Football Matches on Crime' by Olivier Marie, CEP Discussion Paper No. 1012 (<http://cep.lse.ac.uk/pubs/download/dp1012.pdf>).

**Olivier Marie** of the University of Maastricht is a research associate in CEP's education and skills programme.

## Further reading

Mirko Draca, Stephen Machin and Robert Witt (2008) 'Panic on the Streets of London: Police, Crime and the July 2005 Terror Attacks', CEP Discussion Paper No. 852 (<http://cep.lse.ac.uk/pubs/download/dp0852.pdf>).

# Violent crime in the local community does not increase on match days except during a local derby



England's most widely used indicator of young people's education and labour market status is the NEET category – 'not in education, employment or training'. Making comparisons with how France and Germany measure school leavers' progression and achievement, **Hilary Steedman** argues that NEET is no longer good enough.



# Young people without qualifications: how 'headline numbers' shape policy and aspiration

**S**tarting out in working life is getting harder for young people all over Europe. Accessing the high-quality training that eases the transition and ensures good career prospects is a particular struggle for young people with below-average school attainments. To understand and act to improve the outcomes for these young people, European governments need good information on which to base policy decisions.

Statistics collected by national governments underpin such decisions and

these 'headline numbers' help to drive policy debate. They can also send a powerful message to young people and their parents about the education and training routes that lead to good labour market transitions.

Recognising the role played by headline numbers in shaping policy and aspiration, the official French government advisory body on education – the Haut Comité d'Education (HCE) – commissioned Eric Verdier and me to coordinate a comparative study of measures of education outcomes and labour market transitions of the least well-qualified group



of young people. France, Germany and England were selected for in-depth study.

Our study reveals both marked differences between countries in how the 'at risk' group of low-attaining school leavers is analysed statistically and the choice of variables on which to base the statistical description of school to work transitions. But it also reveals some important convergences.

France has moved away from a strictly education-based classification of school-leavers – traditionally a combination of the final class completed and the highest nationally recognised school diploma obtained. The revised classification of school-leavers derives from greater commitment to the importance of a post-16 diploma for all – awarded on success in a two or three year vocational or general course of education and/or training.

French statistics now distinguish between 'early leavers' (*sans qualification*) who have no recognised certification (9% of 20-24 year olds in 2009); those (*sans diplômes*) who complete a post-16 two or three year course but do not pass the examinations for a full certificate or diploma (a further 9%); and those (82%) who complete and pass successfully (*diplômés*).

The employment rates for these three groups of young people are published annually. They tell a powerful story both to policy-makers and young people about the vital importance of gaining a full vocational certificate or general diploma or, failing that, at least completing the course.

The message for teachers, parents and school students is clear: a full vocational qualification reduces the probability of

In France and Germany, the headline number on school leavers' transition to work emphasises progression



unemployment by almost two thirds relative to early leavers; and achieving the Bac diploma (the French equivalent of A-levels) reduces it by a factor of four. Even staying the full two or three year vocational course without passing the examination is beneficial for employment chances.

France relies, perhaps excessively, on school-based nationally standardised vocational and general education for labour market preparation. This provision has inadequate capacity to react to rapidly changing labour market demands. French apprenticeships overcome this problem but they can provide for only a small proportion of those in vocational education.

Nevertheless, the emphasis on successfully completing a two or three year course of vocational or general study at school produces a young population in which two thirds hold a Bac diploma and a further 20% have two or three years of vocational training.

The contrast with Germany could not

be greater. Well over half of all school leavers expect to enter apprenticeship. School marks are of importance for these 16 year old German school leavers only because higher marks increase the likelihood of gaining an apprenticeship place.

Without the labour market recognition that the apprenticeship qualification confers, the employment outlook for German school leavers is grim. 'Not qualified' in Germany equates to 'not trained through apprenticeship'. German labour market transition statistics are overwhelmingly devoted to analysing and understanding access to apprenticeship places.

For almost 20 years, following the shock to the economy of the reunification of Germany in 1990, German states and the federal government struggled to meet the demand for apprenticeship places from young people. Many with low level school qualifications faced long 'waiting periods' spent in special measures and some never gained a place.

The most high profile measure of the German government's competence in education policy was and is the annual 'matching' of apprenticeship applicants to places. Only in 2010 were apprenticeship places close to matching demand from applicants. In 2009, 15% of 20-29 year olds had not received apprenticeship training and consequently faced poor labour market outcomes. The remaining 85% had completed either a three year apprenticeship or three years of full-time education post-16.

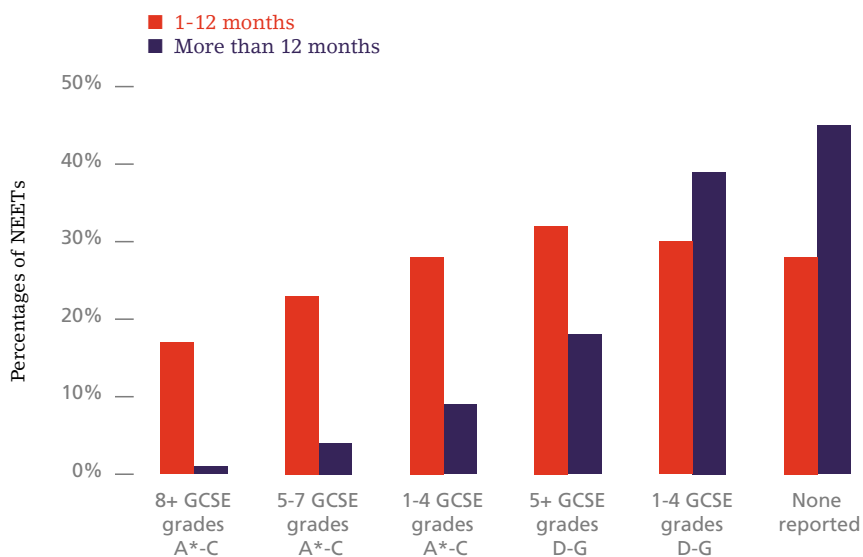
Education statistics published in England do not identify a 'no qualifications' category of young people, as in France, nor a group without recognised occupational training, as in Germany. The most widely used indicator of young people's education and labour market status is the NEET category – 'not in education, employment or training'.

Yet NEET young people are not a 'no qualifications' category. Nearly three quarters of the 15% of the age group classified as NEET in 2010 had some GCSE passes. Of a smaller group – those who have been NEET for more than 12 months – over half had some GCSE passes (see Figure 1).

The difference from France and Germany is the emphasis in England on participation regardless of content or value – any job, any training, any course removes a young person from the 'at risk' category. In both France and Germany, the message from the headline number on school leavers' transition to work is the importance of progression and achievement – progression to a recognised qualification through an academic or vocational pathway in France and

## In England, any job, any training, any course removes a young person from the 'at risk' category

Figure 1: NEET status by age 18 by highest qualification at age 16



Source: DFE Statistical Bulletin B, 1 July 2010

progression through apprenticeship in Germany.

These measures help to set clear goals for 16 year old school leavers, clear goals that are lacking in England. In contrast to France and Germany where 85% reach Level 3 equivalence, only half of all 19 year olds in England achieve any Level 3 qualification. Could these differences in goal-setting account for this failure?

According to Alison Wolf's independent review of vocational education commissioned by the UK's Department for Education and published earlier this year, 'at least 350,000 young people in a given 16-19 cohort are poorly served by current arrangements. Their programmes and experiences fail to promote progression into either stable

paid employment or higher level education and training'.

As the Department for Education sets about implementing the Wolf recommendations for 16-19 education and training, the negative message of the NEET category needs to be replaced by a headline number that reflects and projects the more ambitious goals that Wolf proposes.

This article is based on *Les élèves sans qualification: La France et les pays de l'OCDE* by Ekaterina Melnik, Martine Möbus, Noémie Olympio, Hilary Steedman, Rémi Tréhin-Lalanne and Eric Verdier, a study commissioned by the HCE and coordinated by Eric Verdier and Hilary Steedman ([http://www.hce.education.fr/gallery\\_files/site/21/106.pdf](http://www.hce.education.fr/gallery_files/site/21/106.pdf)).

Professor **Eric Verdier** is at the University of Aix-Marseille. Dr **Hilary Steedman** was a senior research fellow at CEP from 1994 to 2004 and is currently an associate in the education and skills programme.

The negative message of NEET should be replaced by a headline number reflecting more ambitious goals for young people without qualifications



in brief...

# House prices and school quality: evidence from state and private education in Paris

It is now widely understood that the quality of state schools in a neighbourhood has an impact on local house prices. Analysing data for Paris, **Gabrielle Fack** and **Julien Grenet** have looked deeper into this link by exploring how the presence of private schools influences parents' willingness to pay to live near good state schools.

How much are parents willing to pay to get their children into what they perceive to be a better school? The answer to this question has important implications both in terms of school admission policies and urban planning.

Residence-based school admission rules often aim at ensuring a degree of social diversity in schools. But a higher willingness to pay for better schools implies that residential choices are more heavily influenced by the perceived quality of local schools. Contrary to the original objective, this phenomenon will tend to reinforce the level of social segregation between schools and undermine the effectiveness of school catchment areas as a policy tool to reduce educational inequalities.

If parents care about the quality of education and if children are assigned to schools based on their place of residence, then differences in school performance should be at least partly captured in house prices. The housing market therefore provides an indirect way of measuring the average willingness to pay for better schools.

Following this intuition and analysing data from the UK and the United States, empirical studies (including work by CEP's Steve Gibbons and Stephen Machin) have found that there is often a significant house price premium attached to an increase in the average test scores of local schools.

A limitation of these studies is that they restrict the analysis to state schools, ignoring the influence that private schools might have on residential choices. Since admission to private schools is not usually subject to a residence requirement, private education provides an outside option for parents who are not satisfied with the quality of the neighbouring state schools. It seems likely that the willingness of parents to pay for better state schools in a particular neighbourhood is smaller when the number of local private schools is higher.

Our study explores this issue by evaluating how house prices react to the quality of education offered by local schools, both state and private. We analyse comprehensive data on

middle schools (those for pupils aged 11 to 14) and housing market transactions in Paris over the period 1997-2004.

The organisation of secondary schooling in Paris is a useful context for analysing how the interaction between state and private schools influences residential choices because it combines a residence-based system of assignment to state schools with a well-developed and almost entirely publicly funded network of private schools.

Parents who reside in a given neighbourhood have hardly any control over the choice of their child's state school because each catchment area contains only one school and because very few dispensations are granted to applicants who live outside the catchment area. In this context, parents who want to avoid sending their children to a low-performing local state school can either move to another area or seek admission to a private school.

What makes the latter option attractive is that in addition to being entitled to select their pupils from anywhere in the city, private schools usually charge relatively modest fees (between £1,000 and £2,000 a year). As a result, private schooling accounts for about a third of total secondary education enrolment in Paris.

Empirically, the issue of estimating the impact of state school performance on house prices is a challenge for researchers. As in most big cities, the best state schools in Paris tend to be located in the most expensive areas. This feature, however, does not necessarily imply that houses are more expensive because local schools are better.

In fact, the causality might go the other way round. Wealthy neighbourhoods attract households of high socio-economic status whose children tend to perform better at school than those in more deprived areas. This simple mechanism induces a positive correlation between apparent school quality and house prices, even if parents do not take account of the performance of local schools when deciding to move into a neighbourhood.

Our research addresses the causality challenge by





## As elsewhere, Parisian house prices are influenced by the perceived quality of local state schools

comparing the value of house sales across middle school catchment area boundaries – that is, sales of houses located close to each other but assigned to different state schools.

The key justification for this approach is that on average, flats located in the immediate vicinity of school attendance boundaries have similar attributes (period of construction, number of rooms, etc.) and, by definition, belong to the same neighbourhood. The only significant difference between them is that they are assigned to different state schools. Hence differences in cross-boundary house prices can be interpreted as a direct measure of the unequal valuation of the corresponding state schools.

Based on this empirical strategy, we find that the perceived quality of state middle schools has a significant impact on the house prices. Using various measures of school performance, we find that differences in school quality translate into differences in house prices of a similar magnitude to those found in the UK and the United States. Our analysis suggests that roughly 5% of local variations in house prices in Paris are explained by differences in the perceived quality of state schools.

We also show that the impact of state middle schools on the housing market varies with the local density of private middle schools. The effect of school quality is more pronounced for residences in areas with a low density of private schools and is non-existent for areas with the highest density of private schools. Our results suggest that in areas where private schools are scarce, the capitalisation

of state school performance in housing prices is in the same order of magnitude as the individual cost of a private school four-year tuition fee in areas where they are numerous, that is about €4,000 at the average flat price. These findings are consistent with the idea that by offering a relatively cheap outside option to parents who are willing to avoid the constraints of strict catchment areas, private schools tend to mitigate the impact of state school performance on house prices.

In terms of policy implications, our results suggest that the co-existence of state and private schools is an important dimension to take into account when designing school admission policies. In particular, the effect of alternative state school admission rules (strict residence-based assignment, relaxed school zoning, open enrolment, etc.) on residential and school segregation, pupil performance and educational inequalities depends crucially on how the housing market incorporates state and private school performance.

This article summarises 'When do Better Schools Raise Housing Prices? Evidence from Paris Public and Private Schools' by Gabrielle Fack and Julien Grenet, Centre for the Economics of Education Discussion Paper No. 119 (<http://cee.lse.ac.uk/cee%20dps/ceedp119.pdf>).

**Gabrielle Fack** is at Universitat Pompeu Fabra in Barcelona. **Julien Grenet** of the Paris School of Economics is a research associate in CEP's education and skills programme.

Growing numbers of university students in Britain and the United States are staying on after their first degrees to invest in a postgraduate qualification. **Joanne Lindley** and **Stephen Machin** document this trend and assess the impact on wage inequality – among graduates and across the labour force as a whole.

# The boom in postgraduate education and its impact on wage inequality

**M**ass participation in higher education has altered the typical path followed by university graduates. The norm used to be that after obtaining an undergraduate degree, people would finish their studies and enter the labour market. These days, many more students stay on to invest in postgraduate education. Indeed, by 2009 just over 10% of the workforce in Britain and the United States – and more than a third of all graduates – had a postgraduate qualification.

We have documented these trends in postgraduate education and how they relate to rising wage inequality in the two countries. It is now widely understood that

despite rapidly growing numbers of university-educated workers, increased relative demand for their skills has been a key driver of overall wage inequality. Our research reveals that the changing composition of the graduate labour force – and widening wage differentials within this group – has also been a key feature of rising inequality.

Figure 1 shows changes in the proportions of all graduates and postgraduates in the labour force during the past 30 years, as well as the changing share of postgraduates among all graduates. In the United States, the graduate share of employment has increased steadily, rising from 24% in 1980 to 36% in 2009. In Britain, the graduate share doubled between 1996

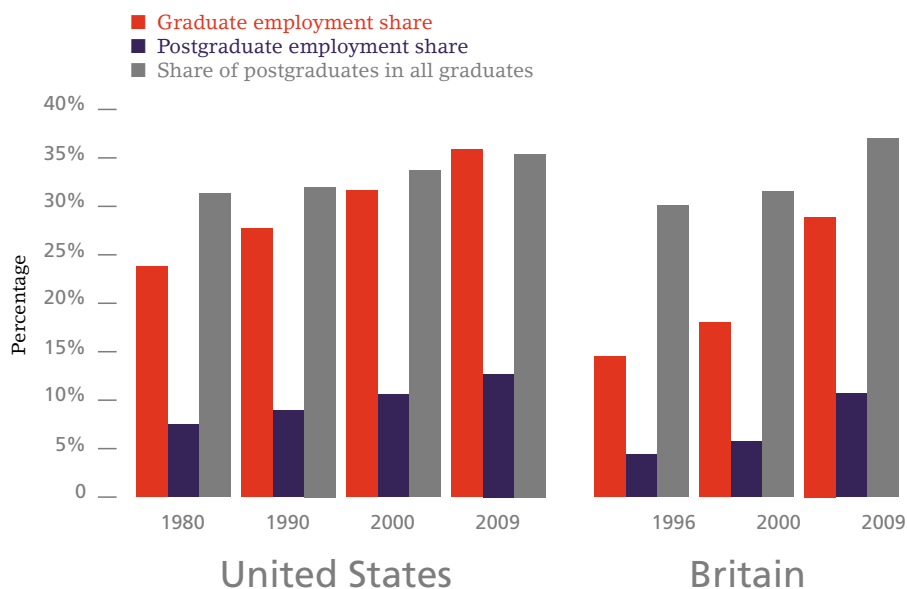
and 2009, going from 14.5% to 29%.

Focusing on postgraduates, there has been a sharp increase in both countries: in the United States from 7.5% to 13% between 1980 and 2009; and in Britain from 4% to 11% between 1996 and 2009. The more rapid increase in the share of postgraduates compared with college-only workers means that the postgraduate share among graduates has increased in both countries: from 31% to 35% of US graduates between 1980 and 2009; and from 30% to 37% of British graduates between 1996 and 2009.

At the same time as postgraduates increased their employment share, their relative wages also rose. Figure 2 shows how the wage differential between those with a postgraduate qualification and

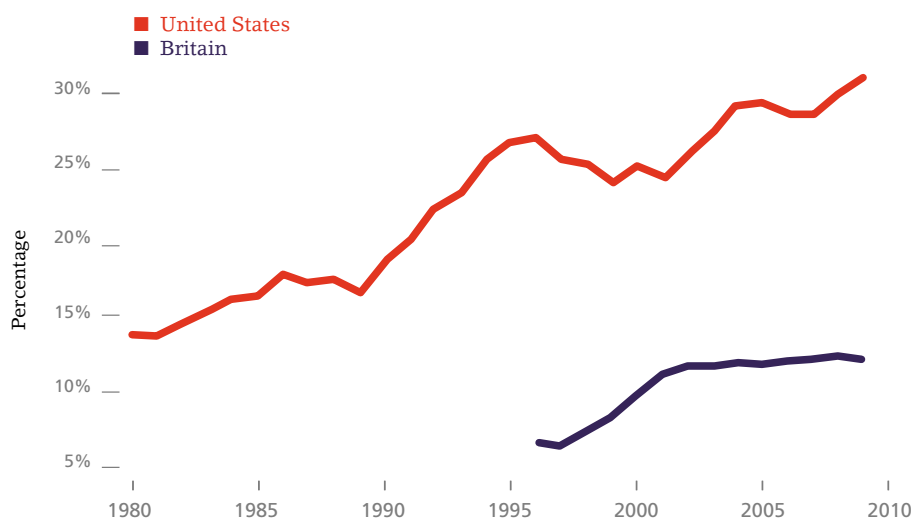


Figure 1:  
Employment shares of all graduates and postgraduates



Source: US Current Population Surveys and Labour Force Surveys in Britain – employment shares are defined for people in work with 0-39 years of potential experience and aged 26-60.

Figure 2:  
Trends in postgraduate/college-only percentage wage differentials



Source: US Current Population Surveys and Labour Force Surveys in Britain – employment shares are defined for people in work with 0-39 years of potential experience and aged 26-60. Percentage wage differentials are calculated controlling for gender, experience, region and ethnicity.

those with just an undergraduate degree has increased through time.

It is evident that postgraduates have significantly strengthened their relative wage position in both countries. In the United States, the postgraduate/college-only wage differential has risen sharply over time, more than doubling from around 14% in 1980 to just over 30% by 2009. In Britain, the postgraduate/college-only gap is lower but it has risen from 6% in 1996 to 13% by 2009.

So it seems that the relative labour market fortunes of postgraduate and college-only workers have evolved differently through time. The clear pattern that emerges in the two countries is of an increase in both the employment shares and wage differentials for postgraduates *vis-à-vis* college-only workers. Rising supply coupled with rising relative wages means that relative demand seems to have shifted over time in favour of postgraduate workers compared with college-only workers.

Previous research has connected the relative demand shifts for different education groups that have underpinned increased wage inequality to measures of technological change. The usual approach is to relate the two in terms of changes across industries through time. This work reports that measures of technology – such as R&D, innovation, computer usage and investment in computers – have been strongly correlated with the increased demand for more educated workers.

Our research also considers this, looking at shifts in labour demand separately for postgraduate and college-only workers, and making comparisons between these two groups of graduates and with other workers without any university education.



## More than a third of graduates in Britain and the United States now have a postgraduate qualification



It turns out that there is a stronger connection between increases in the relative demand for postgraduates and measures of technological change than for college-only graduates. Analysis of changes in employment shares and changes in computer usage in 215 US industries and 51 British industries shows that, for both countries, there is only a positive correlation for postgraduates.

That shifts in labour demand towards postgraduates seem to be (at least in part) driven by technological change is also supported by cross-country patterns of changing labour demand and technology. The analysis shows that bigger shifts in demand occurred in the *same* industries in Britain and the United States and that the changes in computer usage are very much concentrated in the same industries for the two countries.

More evidence that employers are increasingly demanding postgraduates can be seen by comparing the skill sets

required by the jobs of postgraduate and college-only workers. Table 1 shows postgraduate/college-only differences in their estimates of cognitive skills, problem-solving skills, people skills, firm-specific skills, the tasks they use computers for and how routine their jobs are.

It is clear that both sets of graduates do jobs with high skill and job task requirements. But in key skills areas, the levels are significantly higher for postgraduates. For example, postgraduates have higher numeracy levels (especially advanced numeracy), higher levels of analysing complex problems and more specialist knowledge or understanding.

Breakdowns of computer usage are also striking. Postgraduate and college-only workers both report high levels of computer usage, but using computers to perform complex tasks is markedly higher among the postgraduate group.

So it seems that postgraduates possess different skills and do jobs involving different (usually more complex) tasks than college-only workers. This is in line with the finding that relative demand has shifted faster in favour of the postgraduate group, and it appears to be an important aspect of rising wage inequality among college graduates.

We have also compared the occupations of postgraduate and college-only workers. With more recent data, we can consider different forms of postgraduate degree. Table 2 shows the top five occupations in terms of their share in employment for college-only workers and postgraduates with master's degrees and doctorate degrees.

There are several notable features of the top five occupations of these three groups of workers. First, the top five tend to be different occupations in the two countries. Second, while the occupational categories are not quite the same across countries, there are some clear similarities.

Third, the postgraduate occupations are more segregated than the college-only occupations. For postgraduates, in the United States the top five (out of 497 occupations) account for almost half of employment (49%) and in Britain the top five (out of 353 occupations) account for around 45%. The college-only distribution is a lot more dispersed, with the top five accounting for only 16% of employment in the United States and 20% in Britain.

Table 1:  
Skills and job tasks suggesting that postgraduates in Britain are more in demand than college-only graduates

Skill/job task	Postgraduates	College-only
<b>Cognitive skills</b>		
Literacy	4.067	3.763
Simple numeracy (basic arithmetic)	3.606	3.583
Advanced numeracy (maths and statistics)	3.004	2.715
<b>Problem-solving skills</b>		
Thinking of solutions to problems	4.311	4.277
Analysing complex problems	4.179	3.880
<b>People skills</b>		
Making speeches/presentations	3.658	3.148
Teaching people	4.023	3.843
Dealing with people	4.658	4.684
<b>Firm-specific skills</b>		
Knowledge of products/services	3.817	3.831
Specialist knowledge or understanding	4.704	4.548
<b>Computer usage</b>		
Using a computer or computerised equipment	4.607	4.384
Proportion that do not use a computer	1.9%	4.5%
Simple (general purpose) computer users	7.4%	10.9%
Moderate computer users	42.8%	48.6%
Complex computer users	47.9%	36.1%
<b>Routine nature of job</b>		
Performing short repetitive tasks	2.689	2.890
Variety in job	4.315	4.195
Sample size	257	1,095

**Source:** The 2006 Skills Survey. With the exception of the proportions using computers, the numbers are based on a scale of 1-5 for questions on task performance – 'How important is this task in performing your current job?' – for which the choices are 1 'not at all important', 2 'not very important', 3 'fairly important', 4 'very important' or 5 'essential'.

Overall, our findings on increasing divergences within the group of workers who go to university offer new evidence on how the changing education structure of the workforce has contributed to rising inequality. Our focus is on increasing divergences within the group of workers who go to university.

We document that there have been significant increases in the number of workers with a postgraduate qualification and that, at the same time as this increase in their relative supply, their relative wages have risen strongly compared with workers with only a college degree. Trend increases in the relative demand for postgraduates have acted as a key driver of increasing within-graduate inequality and of overall rises in inequality.

The relative demand shifts in favour of workers with postgraduate qualifications are strongly correlated with technical change as measured by computer usage and investment. It turns out that over the

years as computer use has become more widespread in most workplaces, the principal beneficiaries of this revolution have not been all graduates, but those with postgraduate qualifications. As such, there has been a strong connection between the increased presence of postgraduate workers in the labour force and rising wage inequality over time.

This article summarises 'Rising Wage Inequality and Postgraduate Education' by Joanne Lindley and Stephen Machin, CEP Discussion Paper No. 1075 (<http://cep.lse.ac.uk/pubs/download/dp1075.pdf>).

**Joanne Lindley** is a senior lecturer in economics at the University of Surrey. **Stephen Machin** is a professor of economics at University College London and CEP's research director.

## The principal beneficiaries of the computer revolution have not been all graduates but those with postgraduate qualifications



Table 2:

### Top five occupations – college-only, master's degrees and doctorates

#### United States, 2010, 497 detailed occupations

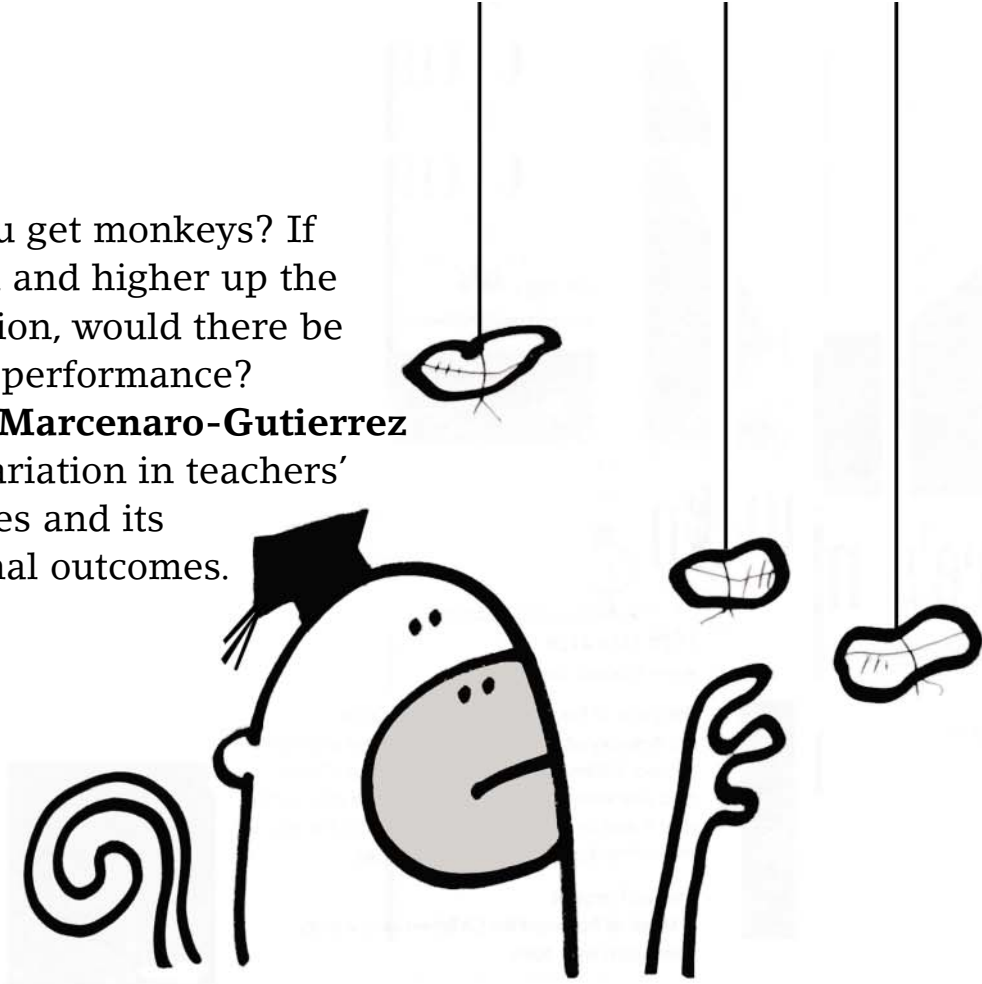
COLLEGE-ONLY		MASTER'S DEGREE		DOCTORAL DEGREE	
Top five occupations	Employment share	Top five occupations	Employment share	Top five occupations	Employment share
1 Elementary and middle school teachers	4.6%	1 Elementary and middle school teachers	11%	1 Post-secondary teachers	21%
2 Managers, all other	3.6%	2 Secondary school teachers	4.7%	2 Physicians and surgeons	10.7%
3 Accountants and auditors and other judicial	3.3%	3 Managers, all other	4.3%	3 Lawyers, judges, magistrates	10.2%
4 Chief executives	2.3%	4 Post-secondary teachers	3.6%	4 Psychologists	3.7%
5 First-line supervisors/managers of retail sales workers	2.2%	5 Education administrators	3.1%	5 Pharmacists	3.6%

#### Britain, 2010, 353 detailed occupations

COLLEGE-ONLY		MASTER'S DEGREE		DOCTORAL DEGREE	
Top five occupations	Employment share	Top five occupations	Employment share	Top five occupations	Employment share
1 Primary and nursery education teaching professionals	5.1%	1 Secondary education teaching professionals	4.8%	1 Higher education teaching professionals	20.7%
2 Marketing and sales managers	4.5%	2 Software professionals	3.6%	2 Medical practitioners	11%
3 Nurses	3.6%	3 Marketing and sales managers	3.5%	3 Bioscientists and biochemists	7.1%
4 Software professionals	3.2%	4 Management consultants, actuaries, economists and statisticians	3.2%	4 Researchers	3.2%
5 Information and communications technology managers	3.1%	5 Information and communications technology managers	3.1%	5 Software professionals	3.1%

If you pay peanuts, do you get monkeys? If teachers were better paid and higher up the national income distribution, would there be an improvement in pupil performance?

**Peter Dolton and Oscar Marcenaro-Gutierrez** examine the enormous variation in teachers' pay across OECD countries and its significance for educational outcomes.



# Teachers' pay and pupil performance

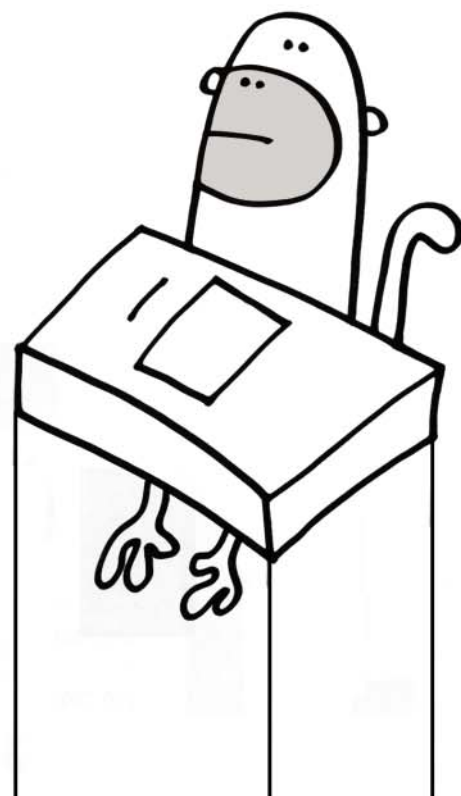
**W**hy do teachers in Switzerland earn four times what teachers in Israel earn? Why are teachers in South Korea paid at the 78th percentile of their country's income distribution whereas those in United States are paid at only the 49th percentile? And do these massive variations in the way different countries treat their teachers matter for the outcomes of their pupils?

Answers to these questions are at the heart of the educational policy debate and we can learn a lot about the relationship between teacher quality and pupil outcomes from cross-national comparisons. The issue is especially relevant in the context of pressures to reduce public spending. Most countries devote a sizeable proportion of their budgets to education – and around 70% of that money goes on teacher salaries.

Our research considers the determinants of teacher salaries across OECD countries and examines the relationship between the real and relative levels of teacher remuneration and the measured performance of secondary school pupils over the last 15 years.

There are two potential explanations as to why teachers' pay may be causally linked to pupil outcomes. The first is that higher pay will attract more able graduates into the profession. As the potential supply of teachers rises because of the higher pay on offer, entry into teaching as a profession will become more competitive. This in turn will mean that the average ability of those entering the job will rise. Once recruited, higher relative pay and/or more performance-related pay may provide teachers with stronger incentives to improve their pupils' educational outcomes.

The second mechanism is more subtle



## Better pay for teachers will attract higher quality graduates into the profession and improve pupil performance

– namely that improving teachers' pay improves their standing in a country's income distribution and hence the national status of teaching as a profession. As a result of this higher status, more young people will want to become teachers. This in turn makes teaching a more selective profession and hence facilitates the recruitment of more able individuals.

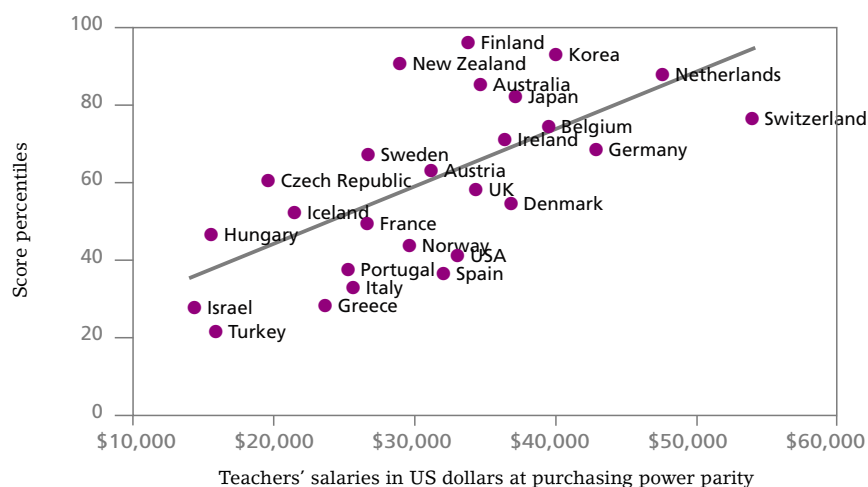
Higher status and higher pay are invariably linked but the two can provide separate driving forces to engineer better recruits to the profession. The key hypothesis is that better pay for teachers will attract higher quality graduates into the profession and that this will improve pupil performance.

The most comprehensive sources of comparative information about teachers in different countries are the OECD's annual 'Education at a Glance' reports. These publications provide information on starting salaries, salaries after 15 years of teaching experience and salaries at the top of the profession.

The relative supply of teachers in a country is measured by the number of teachers as a fraction of the labour force and the pupil/teacher ratio in the education system. An additional supply factor relates to the proportion of the stock of teachers who are women. We also control for the number of teaching hours supplied, since having a lower number of teachers can be compensated for by them working more hours.

We measure the nature of a country's investment in education by the level of educational expenditure as a fraction of GDP, controlling for the rate at which a country is growing, since clearly this will constrain its possible investments in education. The changing nature of the

Figure 1:  
Pupil score percentile as a function of teacher salaries after 15 years of experience



## A 5% increase in the relative position of teachers in the income distribution would increase pupil performance by around 5-10%

demand for teacher services is measured by the demographic growth in the size of the population of school age.

To examine the relationship between teacher remuneration and educational attainment, we use the internationally comparable results from the OECD Programme for International Student Assessment (2000, 2003 and 2006) and Trends in International Mathematics and Science Study (1995, 1999 and 2003).

Figure 1 provides an insight into the relationship between teacher salaries and pupil outcomes, showing a clear statistical association between higher relative teachers' pay and higher standardised pupil scores across countries.

Our research with aggregate country data supports the hypothesis that higher pay leads to improved pupil performance. As an indication of the relative size of this effect, we find that a 10% increase in teachers' pay would give rise to a 5-10%

increase in pupil performance. Likewise, a 5% increase in the relative position of teachers in the income distribution would increase pupil performance by around 5-10%.

What are the policy implications of these findings? Most obviously, if a government is concerned with educational outcomes, then it should be aware that the quality of its teachers is of fundamental importance. We suggest that the route to hiring teachers from higher up the ability distribution is to pay them at a higher point in the country's income distribution.

How could this be achieved? A country with a stock of low quality teachers cannot simply raise the pay of all teachers immediately and expect the quality of teaching to improve. The existing stock of teachers would clearly have an incentive to appropriate these economic rents with no responsibility to

become better teachers. And while the quality of new recruits to the profession would rise as a result of this upward shift in relative pay, it would take a long time – 30 or so years – to change the quality of the whole stock of teachers.

The answer then must be to consider how teacher quality can be raised gradually. If the government were to ratchet up starting pay, this would secure better quality new teachers. But improving the stock of existing teachers would require continued professional development and in-service training and/or attempting to fire the worst teachers.

Such policy measures are not within the scope of this study, but there is a wealth of research evidence about them as possible remedies to improve the existing stock of teachers. One solution is to provide an incentive mechanism for existing teachers to improve quality by paying them according to the percentile performance (in value added terms) of their pupils. Another possible solution is to increase the rate at which teachers' pay rises with their level of experience.

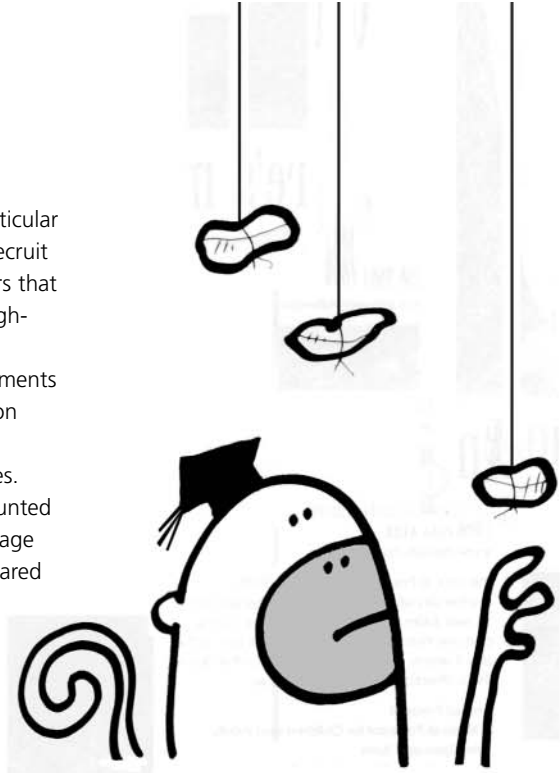
Another dimension of the problem is the time scale over which any improvement in pupil outcomes is sought. If replacing existing teachers with ones of higher quality would take too long, then a quicker fix might be to reduce the pupil/teacher ratio or increase pupil contact hours by simply employing more teachers from the pool of inactive teachers.

Our analysis finds a clear trade-off between pupil/teacher ratios and teachers' pay across countries – that is, countries do not necessarily have to pay higher salaries to secure better pupil outcomes. But if a country is not prepared to pay teachers relatively well, then it will have to go a long way down the road of reducing class sizes to compensate them – in short, governments and educational administrators need to know that there is 'no free lunch' here.

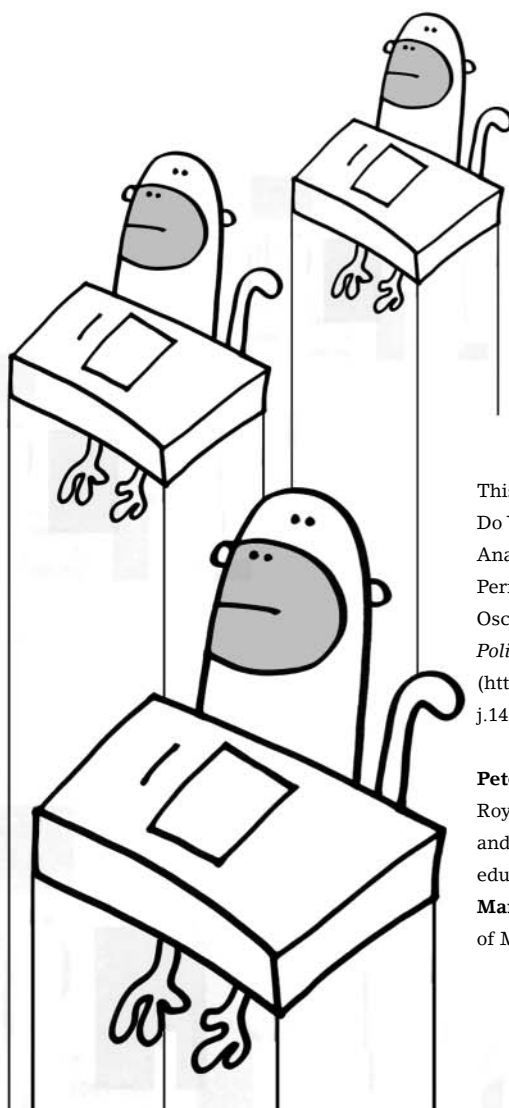
The policy implications of our findings are relevant to the recruitment of teachers and the improvement of educational standards. The link we find between teacher quality and high educational standards has logical implications for any government's commitment to recruit, retain and reward good teachers. In this regard, it seems that increasing teacher salaries (and the speed at which they can

reach higher pay levels within a particular pay structure) will help schools to recruit and retain the higher ability teachers that schools need to offer all pupils a high-quality education.

At a wider policy level, improvements in education appear to be a common factor behind economic growth in recent decades in all OECD countries. The increase in human capital accounted for more than half an extra percentage point of growth in the 1990s compared with the previous decade. One clear way to improve the stock of human capital is to invest in higher quality teachers.



## There is a clear trade-off between pupil/teacher ratios and teachers' pay across countries



This article summarises 'If You Pay Peanuts, Do You Get Monkeys? A Cross-country Analysis of Teacher Pay and Pupil Performance' by Peter Dolton and Oscar Marcenaro-Gutierrez, *Economic Policy* 26(65): 5-55, January 2011 (<http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0327.2010.00257.x/full>).

**Peter Dolton** is a professor of economics at Royal Holloway College, University of London, and a senior research fellow in CEP's education and skills programme. **Oscar Marcenaro-Gutierrez** is at the University of Malaga.



Average earnings vary widely across the regions of Britain, a fact that has prompted many decades of policies aimed at reducing regional disparities. But as **Henry Overman** and **Steve Gibbons** demonstrate, such variation reveals little, especially if we ignore regional differences in the cost of living and availability of local amenities.

# Unequal Britain:

## how real are regional disparities?

**R**egions, cities and neighbourhoods across Britain seem to be very unequal. This is true if we look at average earnings, employment, education and almost any other socio-economic outcome.

Take 'gross value added' (GVA) per person, potentially a good indicator of living standards in different places. In 2005 (a point in time chosen to be sometime before the peak of the boom), the highest ranked regions in Britain were West Inner London and Berkshire with GVAs of £44,050 and £39,850 respectively. The lowest ranked were Liverpool and Blackpool with GVAs half those in the South East: £19,800 and £21,050.

These examples are representative of a broader trend: the top ranked 10% of regions have GVA at least 50% higher than the bottom ranked 10%.

Regional policy, urban policy, even neighbourhood policy are all largely based on concerns about these kinds of disparities. But these figures are simply aggregates of the outcomes for people who live and work in these places. Without further information, we do not know whether the outcomes for people currently living in Manchester would be any different if they lived and worked in London.

We also have no way of knowing if the productivity of London and Manchester would change if these movements of people actually took place. Similarly, we do not know whether replicating the economic, policy, institutional and environmental regime of London in Manchester would change anything without moving people. In short, it is hard to work out what these differences mean in terms of the economic advantages and disadvantages that a place offers to the people who live and work there.

It is also easy to assume from looking at these aggregated figures that disparities between places are big drivers of disparities between individuals. But this clearly need not be the case. For individuals, the disparities within local areas could far exceed those between different areas.

Our research offers new empirical evidence on the nature, scale and recent evolution of economic disparities in Britain (Gibbons, Overman and Pelkonen, 2010). We focus on disparities in individual wages, because wages are linked to productivity and they are an important cause of variation in living standards. We also have very good individual data on wages.

Using these 'micro' data, we assess the extent of and persistence in wage disparities across labour market areas in

Who you are is much more important than where you live in determining earnings

Britain. We examine to what extent these area differences arise because of differences in the characteristics of people who live in different places – 'sorting' – versus different outcomes for the same types of people living in different places – 'area effects'. We also consider the extent to which these differences across areas contribute to overall individual wage disparities.

Our research finds that between 1998 and 2008 there were few changes in area





high wages.

Places with lower wages in Britain tend to be rural but as wages increase, house prices tend to fall not rise (so the relationship between house prices and wages is downward sloping). This suggests that places with high levels of consumer amenities tend to have few productive advantages for firms.

In these places, consumer demand for local amenities drives up land costs and house prices, but since these areas do not offer productive advantages, wages must also be lower to induce businesses to locate there. Households in the lowest wage places are willing to pay high house prices because they are compensated by higher local amenities.

When you look at the places we are talking about – for example, West and East Cornwall, Devon and Kendal – this clearly makes sense. These are places in which ‘underperformance’ and a lack of development has gone hand-in-hand with preservation of rich natural amenities that are highly valued by consumers, even though wages are low. This high valuation of natural and recreational resources, reflected in housing costs, is borne out in more detailed analysis we have done (Gibbons, Mourato and Resende, 2011).

In contrast, moving to higher wage areas – on the right-hand side of Figure 1 – we tend to see house prices increasing as wages rise (so the relationship between house prices and wages is positive). This suggests that local producer benefits tend to drive the relationship for higher wage areas. Firms drive up land costs in these labour markets, and workers must be

**The high valuation of natural amenities is reflected in high housing costs in relatively low wage places like Cornwall and the Lake District**



compensated with higher wages to induce them to live there, but with house prices higher to offset the benefits of higher wages.

Note though, that on the far right-hand side of Figure 1, in London and the South East, amenities for consumers and productive advantages for firms tend to be positively correlated across labour markets. Housing costs rise steeply, more than one-for-one with wages, indicating that consumers are willing to pay over and above the expected wage gain to live in these areas – though here the amenities are quite different from those they expect to find in places like the South West of England and the Lake District.

So across Britain, our research shows that increased living costs (particularly of housing) tend to offset completely increased wages for the average household. In the lowest wage areas, which are mostly rural, differences in amenities drive the trade-off between wages and the cost of living. In higher wage areas, which are mostly urban, differences in firm productivity drive the results.

What are the implications of this research for urban and regional policy in Britain? We highlight four:

**Area averages are not very useful indicators of wellbeing:** Differences in average incomes across neighbourhoods or regions reflect the interaction of area effects and the sorting of people. High wages tend to be offset by high house prices or low quality of life so income differences on their own are not very useful indicators of differences in wellbeing.

**Policy should be assessed by its impact on people not places:** People trade off wages, cost of living and amenities, and they can move in response to changes in any of these. As a result the impact on observed area differences offers a very poor guide to the overall effects of policy on individuals.

**In practice, policy has probably been too heavily focused on places:** Area effects mean that living in some places negatively affects individual outcomes. The usual response is to try to improve ‘bad’ areas. An alternative would be to focus on improving outcomes for people who live in bad areas.

The focus on area differences biases policy towards the first response. Unfortunately, evidence suggests this has not been successful as area effects are very

persistent. This argues for a greater focus on improving outcomes for individuals including, possibly, removing barriers that prevent people relocating to better areas.

**Policy has paid too little attention to house prices and amenities:** Planning decisions play a key role in generating area disparities because people and firms sort in response to both wages and local costs. Similarly, disparities in amenities matter because high quality of life compensates people if wages are low relative to the cost of living. Local policy-makers have policies that directly affect house prices and amenities and relatively few that affect wages and employment.

At a time of constrained finances and weak economic performance it is more important than ever that urban and regional economic policy focus on sensible objectives using cost effective policy levers. Reflecting these four key insights when considering how policy should be targeted and developed would be a useful step in the right direction.

**Henry Overman** is director of the Spatial Economics Research Centre (SERC), professor of economic geography at LSE and a research associate in CEP’s globalisation programme. **Steve Gibbons** is research director of SERC, reader in economic geography at LSE and a research associate in CEP’s education and skills programme.

## Further reading

Steve Gibbons, Henry Overman and Panu Pelkonen (2010) ‘Wage Disparities in Britain: People or Place?’, SERC Discussion Paper No. 60 (<http://www spatialeconomics.ac.uk/textonly/SERC/publications/download/sercdp0060.pdf>).

Steve Gibbons, Henry Overman and Guilherme Resende (2011) ‘Real Earnings Disparities in Britain’, SERC Discussion Paper No. 65 (<http://www spatialeconomics.ac.uk/textonly/SERC/publications/download/sercdp0065.pdf>).

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>).

Employment in the European Union is still falling short of the objectives set by the continent's leaders more than 10 years ago. Nobel laureate **Chris Pissarides** explains why Europe remains behind the United States in job creation, particularly in business services and the health and education sectors.

# The future of work in Europe

**T**he European Union's targets for employment, set at the Lisbon summit of 2000, have not been met by all member states.

The Mediterranean countries in particular have failed to achieve the objective of getting at least 70% of the working age population into employment. And the jobs performance of the continent as a whole continues to lag behind the United States. What is the future of work in Europe?

One way to answer this question is to go behind the aggregate figures and compare which sectors are creating jobs. The transatlantic comparison is interesting for two reasons. First, the United States is still the technologically most advanced

country and a leader in developing new kinds of jobs and new sectors of economic activity. Think of Silicon Valley and the dot.com boom.

Second, had Europe's performance followed the United States more closely over the last 30 years, the employment ambitions of European leaders would have been met. But the employment histories of the two continents deviated, starting sometime in the early to mid-1970s.

To make the argument more concrete, consider the two continents in the period just before the Great Recession of 2008-09. In the first eight years of the 2000s, more than three quarters of Americans but only two thirds of Europeans aged between 15 and 64 were in employment.

Coupled with higher American enrolment rates in higher education, this shows that a lot more Americans were active outside the home than their European counterparts.

Looking deeper into the transatlantic employment gap, three broad sectors account for virtually all the differences (see Figure 1). First, services that are provided directly to the public, such as retailing. Second, services that are mainly business-to-business, such as finance, insurance and commercial property. And third, services related to health and education, which are mostly for self-preservation and self-improvement.

In the late 1970s, the annual hours of work in each sector in the United States exceeded those in the eurozone countries by about 70 for everyone aged between 15 and 64. But by the early 2000s, the extra hours worked annually by Americans had jumped to 120 in health and education, 100 in business-to-business services and nearly 80 in services provided to the public. Moreover, most of the US gains were in health, retailing and a general 'business services' sector that includes accountants, management consultants and expert advisers.

Why are Europeans not creating enough jobs in these sectors? Take



# SELF SERVICE

retailing. Most people who have been shopping in the United States know that it is a lot easier to get assistance in American shops than European ones. Economists attribute these differences to taxation and regulations that make employing retail assistants more expensive in Europe, combined with the fact that there is an alternative to employing more assistants: self-help.

There is a trade-off in shopping. Customers can choose to go to shops with lots of assistants, which are usually more expensive because their costs are higher. Or they can go to cheaper shops where they are likely to spend more time finding what they want themselves and then spend even longer waiting to pay.

In Europe, because the costs of employing shop assistants are higher than in the United States, shops manage to keep their costs down by shifting part of the assistant's job to the customer. IKEA, the home products retailer, could not have been born in the United States.

Something similar is happening in business services. American companies are

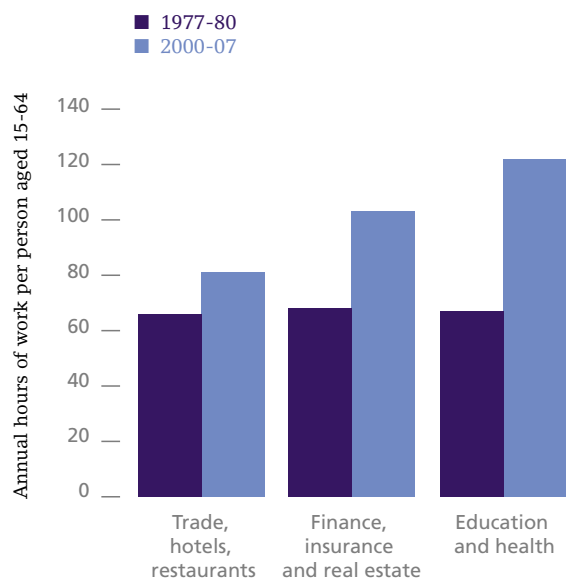
using external advisers and specialist services much more frequently than European companies, because it is cheaper and quicker to set up and operate such businesses in the United States. Instead, European companies might go without some services or they might provide them internally.

The advantage of external services is not only in employment but also in efficiency. By specialising in business services, independent providers are able to improve efficiency and provide a better service for other companies. So Europe is not only losing out in employment by not making it easier to set up and operate business services, we are also losing in productivity.

Many shops in Europe keep their costs down by shifting part of the work of shop assistants to the customer



Figure 1:  
The gap in annual hours between the United States and the eurozone in three industrial sectors



Europe loses out in employment by not making it easier to set up and operate business services

# UNEXPECTED ITEM IN THE BAGGING AREA

But the biggest growth in the gap between the United States and the eurozone is also the most controversial. Employment in health has grown much faster in the United States than in Europe, even though the European population is ageing faster than the American one. Why is that?

The jobs in the American health sector are not only in medical services but also in care, for both young children and older people. But the cost of these services has also risen enormously. Is the reason that we are not creating enough jobs in healthcare services in Europe the fact that we are not allowing costs to rise faster? I would like to think that this is not the reason.

In Europe, we have a more caring social system supported by public policy, and much of the cost of education and healthcare is borne by the state. Demand for these services, especially for health, will increase in the future, partly because of our ageing populations, but also because with rising living standards we expect better personal services and better healthcare.

How can our governments meet the costs of these services? The United States has shown one way: by allowing costs to increase and letting the private sector take the initiative. Sweden and the other Scandinavian countries have shown another way: by increasing taxes and using the revenue to subsidise jobs in healthcare.

The hours of work devoted to jobs in health in Sweden exceed even those in the United States, while hours worked in the eurozone fall well short of both (see Figure 2). But the taxes needed to finance these jobs in Sweden are very high compared with those in other European countries.

Job creation in other sectors, such as retailing and home repairs, has suffered, which means that overall Sweden is behind the United States. So even within Europe, it is not a coincidence that IKEA is a

Swedish company. It is also not a coincidence that eating out in Sweden is much more expensive than – and probably not as common an occurrence as – eating out in, say, Italy.

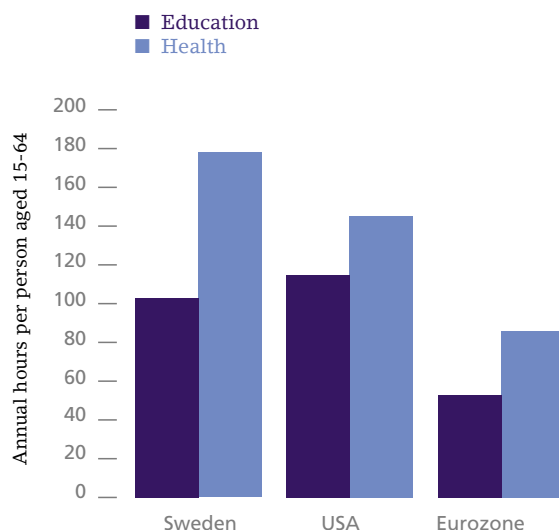
Is this the future of work in Europe? Will our taxes have to go up to subsidise jobs in the sector that will surely feel most pressure for job creation? European citizens have a tough decision to make. But before they even have the luxury of addressing that issue, they must sort out their debt problems. Otherwise the social care system that is so deeply rooted in Europe’s culture will become untenable.

**Chris Pissarides**, professor of economics at LSE, has been a cornerstone of life at CEP since its foundation in 1990 and for many years led the research programme on macroeconomics, particularly unemployment. He was co-recipient with Peter Diamond and Dale Mortensen of the 2010 Nobel Prize in Economics, ‘for their analysis of markets with search frictions’.

This article summarises his lecture at the Fourth Lindau Meeting on Economic Sciences in August 2011, an event that brought together 17 of the 38 living economics laureates with nearly 400 top young economists from around the world.

## The hours of work devoted to jobs in health and education in Sweden exceed those in the United States – but the taxes needed to finance them are very high

Figure 2:  
Annual hours of work in health and education



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**For:** Professor Lord Richard Layard, director of CEP's wellbeing programme

**Against:** Professor Lord Robert Skidelsky, University of Warwick

**Date and time:** Tuesday 18 October 2011, 18:30

Venue: tbc

This event is free and open to all with no ticket required. Entry is on a first come, first served basis. For any queries email [events@lse.ac.uk](mailto:events@lse.ac.uk) or call +44 (0) 207 955 6043.

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**Speaker:** Professor Daniel Kahneman, Woodrow Wilson School, Princeton University

**With:** Professor Lord Richard Layard, director of CEP's wellbeing programme

**Date and time:** Tuesday 15 November 2011, 18:30

**Venue:** tbc

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Editorial and Subscriptions Office  
Centre for Economic Performance  
London School of Economics  
Houghton Street  
London WC2A 2AE

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