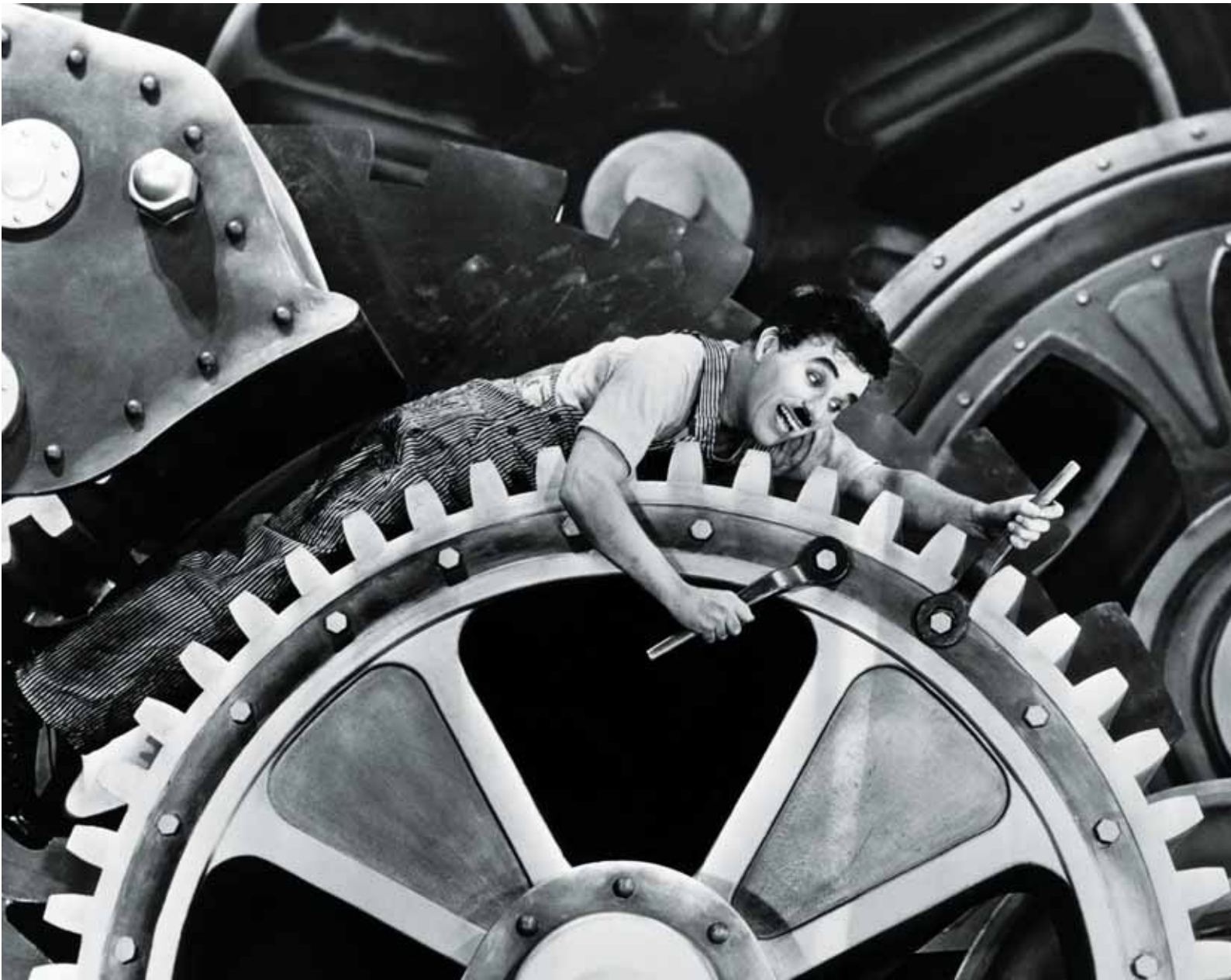


CentrePiece

The Magazine of The Centre for Economic Performance

Volume 17 Issue 1 Spring 2012

Jobs in a recession



UK growth
Energy taxes
Executive pay
Oil and conflict

Corporate innovation
Language barriers
Industrial policy
School funding

CentrePiece



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE ■

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Editorial

With the UK economy seemingly back in recession and national output still more than 4% below its peak in 2008, where next for the country's elusive quest for growth? John Van Reenen, director of the Centre for Economic Performance (CEP), has been prominent in recent debates about the government's austerity plan of tax hikes and public spending cuts, arguing that fiscal consolidation is being implemented too deeply and too rapidly – and is needlessly slowing growth.

He is also co-chair with Tim Besley of the LSE Growth Commission, a major initiative launched in January to inject fresh thinking into the growth debate. The commission will be holding a series of evidence sessions over the coming months, the proceedings of which will be made publicly available as a permanent record. And a report published by the end of 2012 will articulate the commission's views on how to make a sustainable improvement in the growth

performance of the UK economy.

In the meantime, the biggest social cost of absent growth is of course unemployment. That is the focus of our cover story, which draws strong implications for policy from the simple insight that in a recession, people queue for jobs, either literally or metaphorically. Pascal Michailat's analysis suggests that in recessions, unemployment insurance should be more generous and governments should invest in infrastructure. What's more, he says, recessions are the wrong time to be cutting public sector jobs.

Elsewhere in this *CentrePiece* are reports on policy evaluations by CEP researchers. One result is positive: Steve Gibbons and colleagues think that the 'pupil premium' could improve the educational outcomes of children from low-income families. One is negative: Ralf Martin and colleagues reveal the failings of the climate change levy, which

aims to reduce greenhouse gas emissions. And one is mixed: Henry Overman and colleagues find that business support schemes can boost employment but only in small firms and at a cost in terms of productivity.

Finally, our last two articles are on the topical issue of institutional investors and their role in the performance of big companies. One shows that publicly quoted UK firms with higher levels of institutional share ownership have a stronger and more symmetric link between shareholder returns and executive pay. The other has good news about the beneficial impact of institutional investors on innovation. Even before the LSE Growth Commission reports, we know that innovation is a key driver of growth.

Romesh Vaitilingam, Editor
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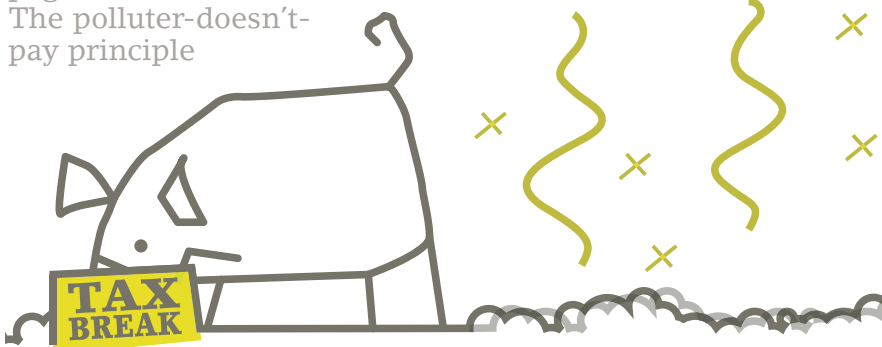
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The long queues of unemployed workers at factory gates during the Great Depression suggest that jobs are lacking in recessions, irrespective of the amount of effort that the jobless put into searching for them.

Pascal Michailat explains how this seemingly simple insight has important implications for today's economic policy debates.

Jobs in a recession

Anyone who has watched Charlie Chaplin's film *Modern Times* knows that people queue for jobs in recessions. In a famous scene, Chaplin opens the newspaper and learns that his old factory is rehiring. He runs off to the factory where he meets hundreds of people seeking employment. The last one to sneak through the gate, Chaplin gets a job while many others are left queuing outside the factory gates.

The model of 'equilibrium unemployment' developed by Peter Diamond, Dale Mortensen and CEP's Christopher Pissarides – for which they were awarded the Nobel Prize in 2010 – provides a very appealing description of the labour market because it describes the creation of jobs by firms, the search for vacant jobs by unemployed workers and the process of matching firms with workers.

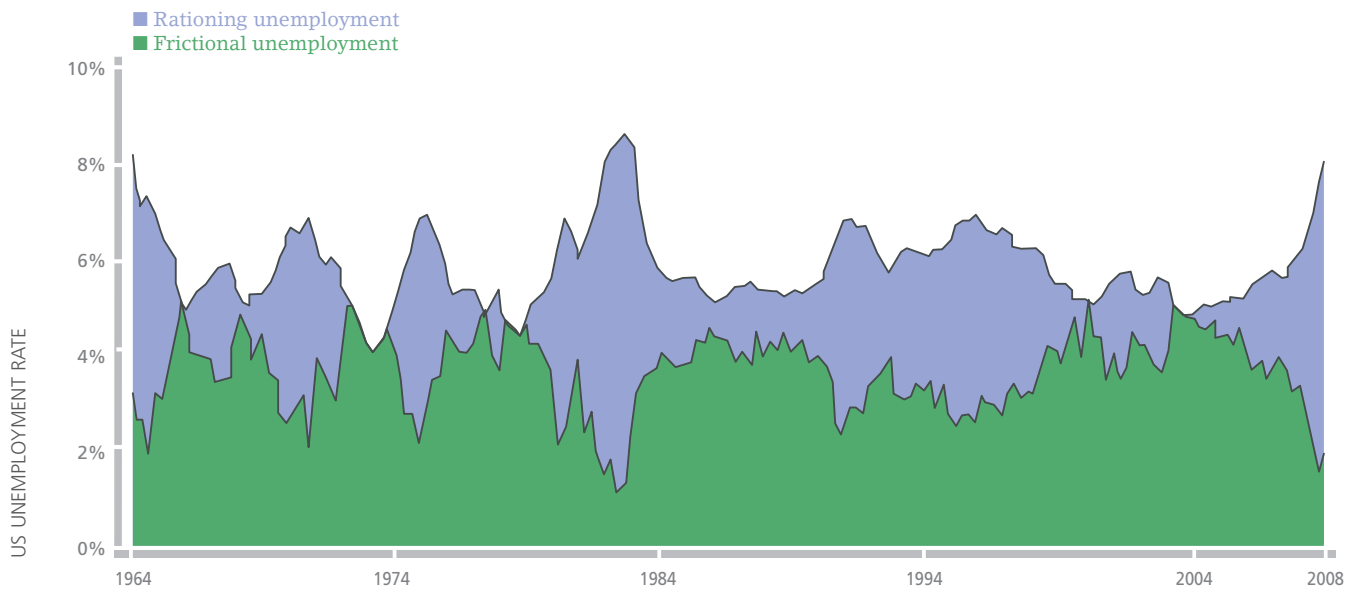
But the model seems inadequate to describe the recessionary unemployment of the Great Depression and more recent times when the business cycle has turned down. The search model of unemployment is inconsistent with the existence of queues in recessions: it converges to full employment when unemployed workers devote an arbitrarily large effort to search for jobs. In other words, all unemployed workers could find a job if they searched sufficiently.

My research develops a model that builds on the equilibrium unemployment model, but which is consistent with the existence of queues in recessions. In my model, jobs are rationed in recessions so that no amount of effort will allow all workers to find a job.

Unemployment is the sum of a rationing component and a frictional component. *Rationing unemployment* measures the job shortage in the economy. *Frictional unemployment*

In recessions, the labour market functions as a rat race: forcing people to search harder will not create more jobs, only more competition in the queues

Figure 1:
Rationing unemployment and frictional unemployment



Source: Michailat (2010)

measures additional unemployment due to frictions in matching firms with workers.

The key feature of the model appears in Figure 1, which plots a simulation of US unemployment and its decomposition into rationing unemployment (the blue area) and frictional unemployment (the green area). There is no rationing unemployment in expansions, but there is as much as 8% of rationing unemployment in deep recessions. Frictional unemployment may be as high as 5% in expansions, but it falls well below 2% in deep recessions (Michailat, 2010).

Even though the labour market always sees vast flows of jobs and workers and a great deal of matching activity, recessions – as in the early 1980s, the early 1990s and the late 2000s – are periods of acute job shortage during which matching frictions have little influence on labour market outcomes.

The intuition is simple once we think about queues. In recessions the firm can hire a new worker immediately, at no cost, in the queue in front of the factory gates. If the firm does not hire a new worker, it is not because of recruiting costs but because it would not know how to use an extra worker. With this result in mind, we can think about the design of economic policies over the business cycle.

When unemployment is high, a critical

Unemployment insurance should be more generous in recessions and less generous in expansions

policy is unemployment insurance. We often hear economists asking for unemployment benefits to be lowered in recessions. They argue that a reduction of unemployment benefits would force jobseekers to spend less time on the couch and more time actively searching for a job. As a result, they say, unemployment would fall and the economy would recover.

They are probably right about the first point that workers would spend more time off the couch searching for a job. But they are mistaken about the second point that unemployment would fall because they forget that people queue for jobs in deep recessions. Once this feature is incorporated into a model, unemployment does not depend much on the efforts of



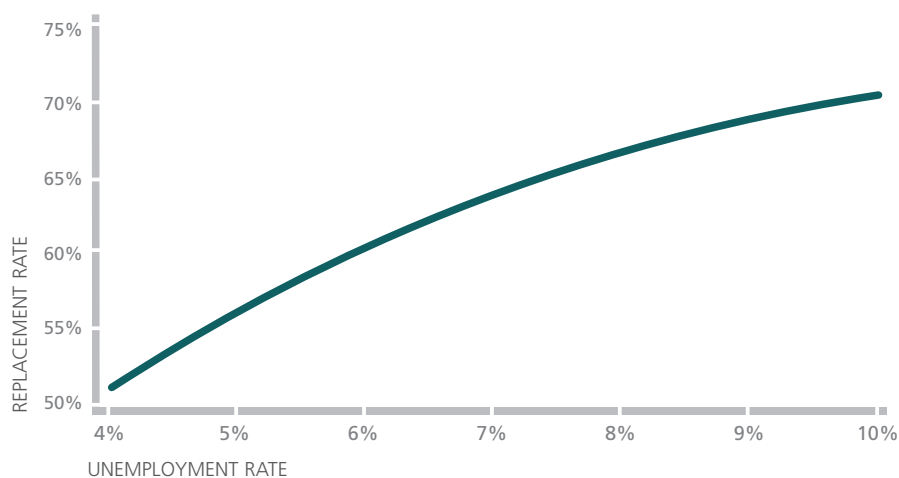
jobseekers in recessions (even when the economy has not reached the point where queues form in front of factory gates).

To understand how to design unemployment insurance in a model consistent with the existence of queues in deep recessions, I collaborated with Camille Landais and Emmanuel Saez.

Our main result is displayed in Figure 2, which plots the optimal replacement rate – the amount transferred to unemployed workers expressed as a fraction of the income of employed workers – as a function of the unemployment rate. It is optimal to increase the generosity of unemployment insurance in recessions: the replacement rate increases from 51% to 71% when unemployment increases from 4% to 10% (Landais et al, 2011).

Again, the intuition for this result is simple once we think about queues. What would happen if the government drastically reduced unemployment benefits in recessions? Perhaps unemployed workers would spend eight hours a day in job queues, instead of four hours in the queue and four hours on the couch. This reduction in benefits implies that there are now, say, 200 people instead of 100 people continuously queuing in front of the factory gates.

Figure 2:
Optimal unemployment insurance over the business cycle



Source: Landais et al (2011)

But the larger number of applicants does not matter for the firm. I have already argued that if the firm does not hire a new worker, it is not because of recruiting costs but because it would not know how to use an extra worker. While lower unemployment benefits do make unemployed workers poorer, they do not

reduce unemployment much. So reducing unemployment insurance in recessions is undesirable.

Some will say that this argument cannot possibly be correct. We (economists) know that when an unemployed worker loses his entitlement to unemployment benefits, he finds a job



The government should invest in infrastructure in recessions rather than expansions to avoid crowding out private employment

much more rapidly than before. That is true. Think about the queues. If you lose your benefits, you will fight your way to the gate and increase your chance of getting the job when there is an opening. But when you move up the queue, the workers that were in front of you are now behind you, and they move down the queue.

The labour market functions as a rat race in recessions. Forcing people to search harder will not increase the number of people who find a job. It may only change who finds a job. So it is not desirable to make unemployed workers poorer. It will not create more jobs, only more competition in the queues.

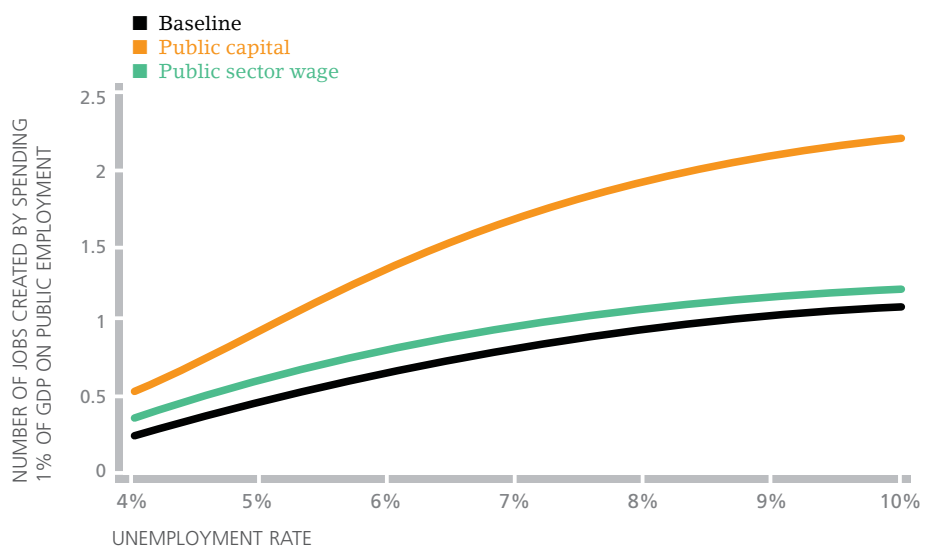
Finally, fiscal policy may be useful to reduce unemployment in recessions. One common complaint about fiscal policy, however, is that it may negatively affect the private sector. These negative effects may undo the possible beneficial effects of the policy.

For example, during the Great Depression, US fiscal policy took the form of public employment. President Roosevelt's administration hired millions of unemployed people to build dams, bridges and roads. The goal of public



The government disturbs private employers much less when it hires workers in recessions instead of in expansions

Figure 3:
Fiscal multipliers over the business cycle



Source: Michailat (2012)

employment was to bring unemployed workers back to work.

But the Roosevelt administration was concerned that the public jobs created as part of the New Deal might make it more difficult for private firms to hire workers by taking away job applicants. They thought that if a mason were hired by the government to work on a public building, it could prevent a construction firm from filling a vacant mason job. If each public job displaced a private job, then it would indeed be ineffective to resort to public employment.

My research shows that while the Roosevelt administration would be right to worry about the displacement of private jobs by public jobs in expansions, there is barely any displacement in recessions. Public employment is especially effective at stimulating the economy at any time when the labour market is depressed.

This result is illustrated in Figure 3, which displays the increase in the employment rate achieved by spending 1% of GDP on public employment. In the basic model (the black line), the number of jobs created by public employment increases nearly fourfold from 0.27 to 1.15 when the unemployment rate increases from 4% to 10% (Michaillat, 2012).

The number of jobs created is larger when public sector employees contribute to improving infrastructure (the orange line) because building public capital improves productivity in the private sector, which translates into higher private employment in the future. The number is also larger when public jobs pay somewhat below private jobs (the green line, which is obtained with a 5% wage premium in the private sector).

These results suggest that the Roosevelt administration responded appropriately by hiring workers as part of large infrastructure projects, and by paying relief-job wages typically well below private sector wages.

The model is too simple to be the basis for quantitative estimates of the effects of actual fiscal policy interventions. Nonetheless, it has some theoretical features that could guide the design of policies in recessions.

A first feature is that to maximise the benefits to society as a whole, unemployment insurance should be more generous in recessions and less generous

in expansions. Another feature is that the government disturbs private employers much less when it hires workers in recessions instead of in expansions.

An implication is that if the government needs to conduct infrastructure projects, it should plan to do it in recessions instead of expansions to avoid crowding out private employment. Another implication is that if the government needs to lay off public sector employees, it should do it in expansions instead of recessions so that public employees who are laid off are able to find a job rapidly in the private sector.

Pascal Michaillat is a lecturer in economics at LSE and a research associate in CEP's labour markets programme. This article draws on some of his recent research papers:

Pascal Michaillat (2010) 'Do Matching Frictions Explain Unemployment? Not in Bad Times', CEP Discussion Paper No. 1024 (<http://cep.lse.ac.uk/pubs/download/dp1024.pdf>) and forthcoming in the *American Economic Review*, June 2012

Camille Landais, Pascal Michaillat and Emmanuel Saez (2011) 'Optimal Unemployment Insurance over the Business Cycle', CEP Discussion Paper No. 1078 (<http://cep.lse.ac.uk/pubs/download/dp1078.pdf>)

Pascal Michaillat (2012) 'Fiscal Multipliers over the Business Cycle', CEP Discussion Paper No. 1115 (<http://cep.lse.ac.uk/pubs/download/dp1115.pdf>)

If the government needs
to lay off public sector
employees, it should
do it in expansions rather
than recessions



After a century of decline in which UK productivity fell behind that of France, Germany and the United States, the last three decades have seen the country catching up. A CEP report by **Anna Valero** and colleagues focuses on performance during the Labour years 1997-2010 – and draws lessons for the current government’s strategy for growth.



Growth and productivity:

UK economic performance since 1997

A common view is that the performance of the UK economy between 1997 and 2010 under Labour was very weak and that the country’s current economic problems are a consequence of poor policies. In a recent report, we analyse the historical performance of the UK economy since 1997 compared with other major advanced economies and with performance prior to 1997, notably the years of Conservative government, 1979-97.

We focus on measures of business performance, especially productivity growth. This is a key economic indicator since in the long run, productivity determines material wellbeing – wages

and consumption. Productivity determines the size of the ‘economic pie’ available to the citizens of a country. GDP per person is a function of productivity (say output per employee) and the jobs market (the percentage of the population employed).

The big picture

We conclude that relative to other major industrialised countries, the UK’s performance was good after 1997. The growth of GDP per capita – 1.42% a year between 1997 and 2010 – was better than in any of the other ‘G6’ countries: Germany (1.26%), the United States (1.22%), France (1.04%), Japan (0.52%) and Italy (0.22%).

Figure 1 shows GDP per capita levels in four countries relative to 1997. The height of the line indicates the cumulative growth: in 2010, the UK had a level of GDP per capita 17% higher than in 1997; over the same period, US GDP per capita had grown by 14%.

The UK’s high GDP per capita growth was driven by strong growth in productivity (output per hour), which was second only to the United States, and good performance in the jobs market (which was better than in the United States). The UK’s relative economic performance appears even better in the years prior to 2008 before the Great Recession engulfed the developed world.

But wasn't it all a bubble?

The UK's impressive productivity performance relative to other countries was a continuation of the trends during the period of Conservative government from 1979. This broke a pattern of relative economic decline stretching back a century or more.

UK GDP per capita fell relative to France, Germany and the United States from 1870 to 1979, but over the next three decades this trend reversed. UK GDP per capita was 23% above the United States in 1870 whereas the United States was 43% ahead of the UK in 1979. By 2007, the UK still lagged behind the United States, but the gap had closed to 33%.

During the past 30 years, the UK has had a faster catch-up of GDP per capita with the United States under Labour than under the Conservatives, although there has been a slower rate of relative improvement when the UK is compared with France.

But surely the growth of productivity was all due to 'unsustainable bubbles' in sectors such as finance, property and oil? Actually, the answer seems to be 'no'. The expansion of property and the public sector both actually held back aggregate

productivity. The financial sector contributed only about 0.4% of the 2.8% annual growth in the UK market economy between 1997 and 2010.

Our analysis shows that the productivity increases were mainly in business services and distribution, and they were generated through the increased importance of skills and new technologies. It is difficult to see how all such activities could have been generated by an artificial financial or property bubble.

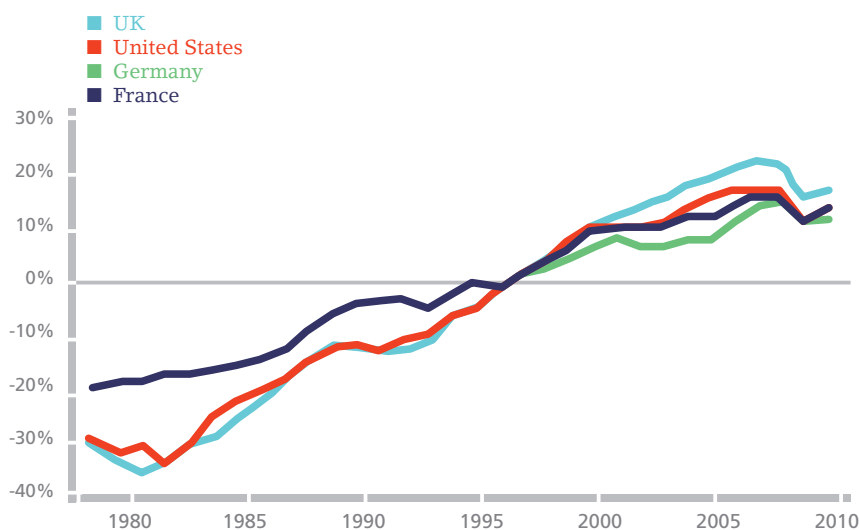
Analysis of other indicators of business performance – such as foreign direct investment, innovation, entrepreneurship and skills – supports our view that the gains in productivity were largely real rather than a statistical artefact.

This points to a more positive reading of the supply side of the economy than the current consensus. Although the UK still has some longstanding issues in terms of lower investment relative to other G6 economies (especially in R&D and vocational skills), things have improved.

Fig. 2.



Figure 1:
Trends in GDP per capita 1979-2010 (relative to 1997)



Notes: The analysis is based on OECD data (with Germany dropped before 1997 due to reunification). GDP is measured in US dollars at constant prices and constant PPPs, using the OECD base year of 2005. The working age population data are from the US Bureau of Labor Force Statistics. For each country the logged series is set to zero in 1997, so the level of the line in any year indicates the cumulative growth rate (for example, a value of 0.1 in 2001 indicates that the series grew by $\exp(0.1) - 1 = 11\%$ between 1997 and 2001). The steeper the slope of the line, the faster growth was over that period.

UK economic performance under Labour continued the trend of improvement under the previous Conservative government

Did Labour's policies have any positive influence?

Some have argued that Labour simply enjoyed a 'free ride' on the radicalism of Mrs Thatcher. Most analysis suggests that freeing up the labour market through breaking union militancy, removing subsidies for 'lame ducks' and implementing privatisation, lower marginal tax rates and cuts in benefits all boosted performance after 1979. On this line of argument, the best that could be said is that at least Labour did not return to the failed pro-union, anti-competitive policies of the 1970s.

But the 'at least Labour didn't mess it up' argument is not compelling. It is hard to believe that the Thatcher reforms permanently kept productivity growth higher for the next 15 years. The anti-union policies may have raised output, for example, but it stretches credulity to think that they kept the UK on a permanently better path of productivity growth.

We believe that it is more likely that some policies of the Labour government drove some of the productivity improvement. In particular, the strengthening of competition policy and utility regulation, the support for innovation and the expansion of university education played a positive role. It is possible that immigration may have also played a positive role.

Establishing the exact magnitude of the causal impact of these policies is difficult, and the need for proper quantitative policy evaluation remains as strong as ever. Unfortunately, Labour's rhetoric of 'evidence-based policy' often did not work out in practice. As with the present government, there was too much 'policy-based evidence'.

The policy area where Labour clearly failed was financial regulation. In addition, and more clearly with hindsight, public debt was allowed to rise higher than it should have done. Although these factors did not drive the boom and did not cause the global recession by themselves, the UK economy was more vulnerable to the recession than it should have been.

Does the Great Recession change everything?

Does the experience of the recession since 2008 show that the productivity improvements to the supply side since 1997 were illusory? We have argued 'no'

as the 1997-2010 improvements were real and not due to the bubble sectors of finance, property and oil. But how much did the financial crisis permanently reduce the rate and level of productivity growth?

The extreme version of the 'supply-side pessimism' argument is that because the recession was caused by a banking crisis, the fall in potential output has been so severe that the UK's output gap (the difference between actual and potential GDP) is now close to zero and productivity growth will be permanently lower. Pessimists point to the 7% fall in GDP and slower growth from the trough of the 2009 recession.

It is likely that the recession has caused some permanent fall in output compared with what it would have been without a deep downturn. But there is huge uncertainty over the size of the output gap. An alternative explanation to a supply shock that has permanently reduced the level and growth rate of potential output is simply that global demand is muted.

Policies based on an excessively pessimistic view of potential output can lead to needlessly slow growth

Productivity increases under Labour were mainly in business services and distribution, not finance and property bubbles



Three considerations point in a more optimistic direction. First, the pre-2008 productivity growth rate suggests that the supply side made real improvements before the crisis.

Second, the fall in productivity between 2008 and 2011 is broad-based and not all due to specific sectors such as finance and oil (just as the 1997-2008 productivity growth rates were not dominated by these sectors).

Third, wage growth remains very low, consistent with substantial spare capacity in the economy.

We worry that policies based on an excessively pessimistic view of potential output can lead to needlessly slow economic growth. Indeed, pessimism over the state of the supply side can become self-fulfilling as ever-larger austerity programmes cause excess scrapping of human and physical capital.

Policies in the short to medium run: to Plan B or not to Plan B?

The current 'Plan A' for the UK economy is a period of very strong fiscal consolidation – spending cuts and tax rises to eliminate the structural public sector deficit in the life of this Parliament.

An alternative Plan B would be to slow down the pace of the fiscal consolidation. If the output gap were near zero, then Plan B would simply increase inflation, so the fact that we think there is a good chance of a substantial output gap implies the possibility of a Plan B.

The desirability of a Plan B would be muted if monetary policy was sufficient, if fiscal policy was ineffective in an open economy like the UK, if any increase in public spending or tax cuts was irreversible or if markets would panic at any retreat from Plan A.

Our report considers these problems, but does not find them overwhelming objections. We argue that we do indeed need a medium-term plan for debt reduction but this does not have to be done at the current speed when the advanced world economy is so fragile. Thus we need a short-term stimulus ('Plan B') and a long-term growth strategy ('Plan V').

A strategy for long-run growth

Whatever view is taken on shorter-term policies, all sides agree on the need to focus on longer-term growth. The report draws out some of the lessons from our analysis for how to restore longer-term growth.

The structural improvement in the UK's relative performance since 1979 contains the lesson that getting the market environment right is key: strong product market competition, openness to foreign investment, flexible labour markets, a welfare to work system and smart regulation are major factors in promoting growth. Government has a role in all of this, setting the rules, and it also needs to be pro-active in building human capital and infrastructure and supporting innovation.

Our report argues that a growth strategy must go beyond the 'laundry list' approach as policies interact with each other and efforts must be focused. We sketch a plan for a 'V-shaped' recovery that requires the state and civil society to scan the global economy for potential growth in demand, and then focus on areas where the UK has actual or latent comparative advantage.

Within this space, there has to be relentless scrutiny of where the state is hindering and where it could help. A specific example is higher education, a globally growing sector in which the UK has comparative advantage as witnessed by the country's strong science base and high share of the market for overseas students (who count as service exports). Restricting immigration is hugely damaging to this sector.

More generally, growth policies could include supporting sector-specific skills, access to credit for small enterprises and innovation in key industries such as software and healthcare. We offer less of a blueprint for growth than a way of thinking about growth that could form the basis for economic revival.

This article summarises 'UK Economic Performance Since 1997: Growth, Productivity and Jobs' by Dan Corry, Anna Valero and John Van Reenen, CEP Special Paper No. 24 (<http://cep.lse.ac.uk/pubs/download/special/cepsp24.pdf>).

Dan Corry, chief executive of New Philanthropy Capital, was head of the Number 10 Policy Unit, 2007-10. **Anna Valero** is an occasional research assistant in CEP's productivity and innovation programme. **John Van Reenen** is director of CEP and co-chair with Tim Besley of the LSE Growth Commission, which will report at the end of the year on policies to boost sustainable UK growth.



Getting the market environment right is key for promoting long-run growth

in brief...

Urban schools: does money make a difference?

It might seem self-evident that a school's resources influence its pupils' educational outcomes, yet so many studies have found little association between greater funding and improved academic achievement. **Steve Gibbons** and colleagues examine whether money makes a difference in the context of urban primary schools in England.

The question of whether there is a link between school resources and pupil outcomes is very important at a time of public spending cuts. In education, these cuts are arising because nominal expenditure on almost everything has been frozen while inflation is rising. The one exception is the government's 'pupil premium' policy, which pays schools a specific sum of money for each child from an economically disadvantaged background – as measured by whether they are eligible to receive free school meals.

The amount is currently £430 per disadvantaged pupil and it is set to rise to £600 in 2012/13. Because only 17% of pupils are eligible to receive free school meals, this does not work out as a large amount on average. But while it is not enough to outweigh the effects of inflation on overall school expenditure (which is falling in real terms), it has important distributional consequences for how resources are allocated between schools.

Our research looks at whether changes to schools' resources really make much difference to pupil achievement, as measured by key stage tests at the end of primary school. We are able to do this because of a quirk in the national funding formula.

This quirk is related to the 'area cost adjustment', which is intended to compensate for differences in the costs of

Cuts to school funding are likely to have negative consequences for pupils' academic achievement



Photo Jackie Schieder | jackieschoolfoodblog.blogspot

employing teachers between local authorities. In reality, however, closely neighbouring schools in adjacent local authorities are not recruiting in different labour markets, and their teachers are paid according to national pay scales that do not correspond to the area cost adjustments.

The result is that schools that are just yards apart on either side of a local authority boundary can get very different levels of funding. This has led to various local campaigns against the perceived unfairness of the arrangements – for example, the ‘fair deal for Haringey schools’ campaign. For research purposes, the arrangements are useful because they make it possible for us to compare schools that are similar in every respect except for differences in school funding.

We evaluate whether schools with different levels of expenditure (arising from the funding anomaly) have different outcomes in national tests in English, maths and science at the end of primary school (key stage 2 tests). The analysis is carried out using the National Pupil Database (a census of all pupils in state schools) between 2004 and 2009.

Since our strategy relies on schools being near a local authority boundary, the schools in our sample tend to be in urban areas with a higher than average intake of disadvantaged pupils. Our research design ensures that the schools we are comparing on either side of the local authority boundary really are similar. We only compare community schools with a similar level of disadvantage (as measured by the intake of pupils eligible to receive free school meals) that are within 2km of the comparison school (on the other side of the boundary).

We also check that the schools look similar in other respects – for example, their ethnic mix, the proportion of pupils who speak English as a first language, school size and neighbourhood house prices – and that pupils are not moving across boundaries in response to funding differences between schools. All our checks suggest that the methodological design is appropriate for measuring the true causal impact of the funding differences between schools.

The results show large effects of expenditure on educational attainment at the end of primary school. They suggest that an additional £1,000 per pupil paid to schools in these urban areas (close to local authority borders) raises pupil test scores at key stage 2 significantly. The effect is equivalent to moving one in five pupils currently achieving level 4 in maths (the target grade) to level 5 (the top grade) and just under a third of pupils currently at level 3 in maths to level 4.

The effects of expenditure also tend to be higher in schools with more disadvantaged pupils. These effects are large. They suggest that cuts to funding in schools will

The pupil premium could close the performance gap for schools with lots of pupils from low-income families

have consequences for pupils’ academic achievement. More positively, they suggest that the pupil premium could have a very beneficial effect and will help to close the performance gap for schools that enrol high shares of pupils from low-income families.

We cannot use this analysis to say what types of expenditure are more or less effective for raising pupil achievement. But we provide some insights by looking at how the overall funding differences affect spending in various categories.

We find that additional income tends to get spent disproportionately on items other than teaching costs (the biggest item), with small increases in the shares spent on learning and computer resources, professional services and supplies. This might be because small expenditure differentials cannot easily be used to employ additional teachers and the inflexibility of pay structures limits any pay for performance.

The main insight of our analysis is that funding matters considerably more than analysts and media commentators often suggest. We should be concerned about the consequences of cuts to real expenditure in state schools. Local campaigners have also been right to raise concerns about school funding inequalities generated by the area cost adjustment in the national formula.

This article summarises ‘Does Additional Spending Help Urban Schools? An Evaluation Using Boundary Discontinuities’ by Steve Gibbons, Sandra McNally and Martina Viarengo, Centre for the Study of the Economics of Education Discussion Paper No. 128 (<http://cee.lse.ac.uk/ceedps/ceedp128.pdf>).

Steve Gibbons is research director of the Spatial Economics Research Centre (SERC), reader in economic geography at LSE and a research associate in CEP’s education and skills programme. **Sandra McNally** is director of CEP’s education and skills programme and professor of economics at the University of Surrey. **Martina Viarengo**, an assistant professor at the Graduate Institute in Geneva, is a research associate in CEP’s education and skills programme.

More discussion of this study is on the SERC blog: <http://spatial-economics.blogspot.com/2011/09/urban-schools-more-money-better.html>

in brief...

Language barriers? The impact of non-native English speakers in the classroom

The number of primary school pupils in England who do not speak English as a first language has been growing in recent years. **Sandra McNally** and colleagues examine whether this is damaging the educational outcomes of native English speakers.

The number of non-native speakers of English in primary schools in England has increased by a third over the past 10 years. Now, roughly one in nine children between the ages of 5 and 11 do not speak English as a first language. A significant driver of this change has been immigration, though the trend has also been influenced by higher birth rates among ethnic minority groups.

The change has led some commentators to fear that the impact might be detrimental to the educational attainment of native English speakers. They fear that teachers' time will be taken up giving extra help to children who do not speak English as a first language.

Yet several studies have shown that first and second generation immigrants are, on average, better educated than the native population. This suggests that there might be things about the children of immigrants – such as having better educated parents – that can compensate for any lack of language fluency at an early age. In that case, native English speakers would not necessarily suffer from having such children as their peers.

Our research analyses a census of all children in English schools – the National Pupil Database – to explore these issues. We look at whether there is an association between the proportion of

non-native English speakers in a year group and the educational attainment of native English speakers at the end of primary school – and whether it can be interpreted as a causal relationship.

We also split the data into white and non-white non-native speakers to see if there might be different effects. Although the latter group is more important numerically, the former has grown very sharply after the eastern enlargement of the European Union (EU) in 2005.

We find that there is a modest negative correlation in the raw data between the educational attainment of native English speakers and the proportion of non-native

The growing proportion of non-native English speakers in primary schools is not detrimental to the educational attainment of native English speakers



speakers in their year group. This correlation is halved once the demographic characteristics of native English speakers have been controlled for. It disappears altogether once the type of school attended by non-native English speakers has been controlled for.

This means that the negative correlation in the raw data reflects the fact that non-native English speakers typically attend schools with more disadvantaged native speakers. Once this fact has been taken into account, there is zero association between their presence in greater numbers and the educational attainment of their native English-speaking peers.

This result also holds true for younger cohorts (age 7 instead of age 11) and when looking at the number of languages spoken in the year group instead of the percentage of non-native English speakers. We explore many different aspects of heterogeneity, for example, looking at native English speakers who are disadvantaged, who are of low ability and who are based in London.

We also divide non-native English speakers into those who appeared in the school census in the last two years of primary school versus those who were in the school census before that time. This affects the raw association between the percentage of non-native English speakers and the educational attainment of native English speakers. But once demographics of native speakers and school controls are added, the effects go to zero in almost every case.

Under certain assumptions, our estimates can be interpreted as reflecting a causal relationship. While we cannot fully test these assumptions, our analysis strongly suggests that negative causal effects of non-native English speakers on the educational attainment of native English speakers can be ruled out.

We also use another research strategy to look at the relationship between the percentage of white non-native English speakers and the educational attainment of native English speakers. This strategy uses the fact that the number of white non-native English speakers grew dramatically after the EU's eastern enlargement in 2005.

Since many of the new immigrants were Polish (and likely to be Catholic), there was a big rise in the demand for Catholic schooling. The data show a much larger increase in the percentage of white non-native English speakers in (state) Catholic schools after 2005 compared with other schools.

We use this as a 'natural experiment' to see if there were consequences for the relative educational attainment of native English speakers in Catholic schools. The results for

Non-native English speakers are more likely to attend schools with disadvantaged native speakers

reading and writing show no clear impact, but there is some evidence for a small, positive effect in the case of maths. In other words, native English speakers at Catholic schools that saw a strong relative increase in white non-native speakers benefited to a small extent in their maths results.

We can only speculate as to the possible reasons for this result. It may be the fact that immigrants from East European countries are better educated and more attached to the labour market than the native population. The children of such immigrants may be a welcome influence in the schools they attend.

The two different research strategies apply to different populations. The first shows associations that are applicable to all schoolchildren. The second – making use of eastern enlargement – only estimates the effects on native English speakers in Catholic schools who were exposed to an increase in white non-native speakers after enlargement. Thus, the latter results cannot be extrapolated to other contexts.

But both strategies suggest that negative effects of non-native English speakers can be ruled out. Thus, the growing proportion of non-native English speakers in primary schools should not be a cause for concern: this trend is not detrimental to the educational attainment of native English speakers.

This article summarises 'Non-native Speakers of English in the Classroom: What are the Effects on Pupil Performance?' by Charlotte Geay, Sandra McNally and Shqiponja Telhaj, Centre for the Study of the Economics of Education Discussion Paper No. 137 (<http://cee.lse.ac.uk/ceedps/ceedp137.pdf>). The research was funded by the Nuffield Foundation.

Charlotte Geay is at the Paris Graduate School of Economics, Statistics and Finance.

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

Shqiponja Telhaj is a lecturer at the University of Sussex and a research associate in CEP's education and skills programme.



When governments design policies to reduce firms' greenhouse gas emissions, are they too lenient on heavy polluters that claim such measures will damage their ability to compete in the global economy? **Ralf Martin, Laure de Preux** and **Ulrich Wagner** assess the UK's experience with the climate change levy.

The polluter-doesn't-pay principle

The idea that people who are responsible for creating a mess should be charged for its removal resonates with common perceptions of fairness. But in public policy-making, even before the financial crisis, there are many examples of this idea being turned on its head.

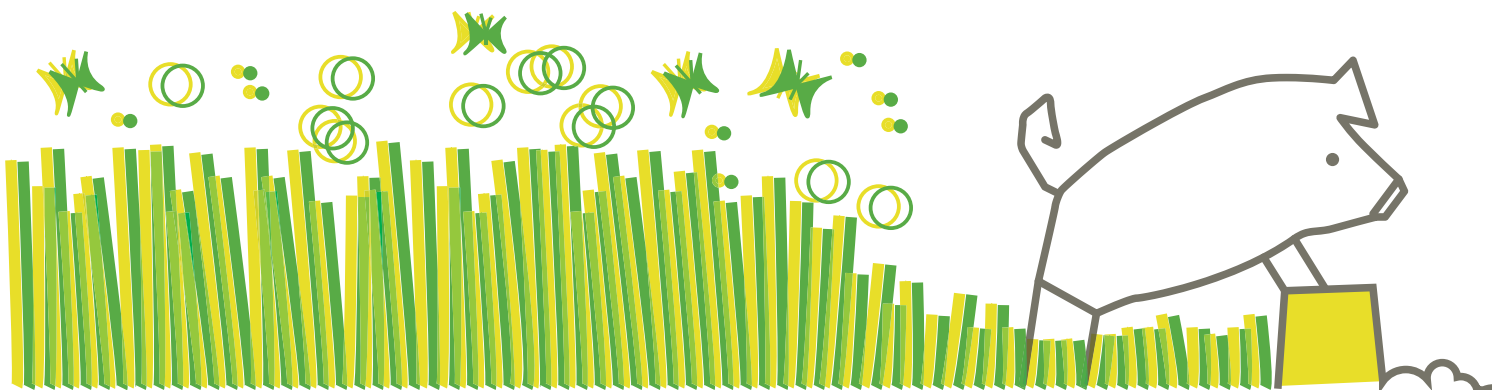
Climate change policy is one such area – a problem inherently linked to the realities of trying locally to regulate greenhouse gas emissions that are

thoroughly global in their impact. Despite many efforts to coordinate policies across countries since the signing of the United Nations Framework Convention on Climate Change 20 years ago, climate change policy is still very much a localised affair.

So although some governments are trying to reduce emissions, they also worry about the possible negative effects of pollution legislation on the competitiveness of their countries or regions. In a globalised economy, such concerns are not

unfounded as the dynamics of comparative advantage are conducive to shifting pollution-intensive production from regulated to unregulated regions.

Regulated firms also have every incentive to play up the risks to their competitiveness even if there is no basis for their claims. What's worse is that governments have little to go by in evaluating such risks other than the assessments of the regulated firms themselves. And irrespective of any risks to



firms' ability to compete against their counterparts in less regulated places, it is the biggest emitters who have the biggest incentives and deepest pockets to lobby against any regulations.

Hence, it does not seem far-fetched to consider the hypothesis that risk-averse politicians are often unnecessarily timid in imposing climate change regulations and are likely to adopt a more lenient approach than would be desirable.

To examine this hypothesis, we have looked at the effects of the UK's climate change levy, an energy tax introduced by the UK government in 2001 supposedly to give firms an incentive to reduce their energy consumption and thereby their greenhouse gas emissions. In parallel, motivated by concerns about competitiveness, the government granted a significant discount – initially 80% and later reduced to 65% – from the tax to a large number of industrial sectors whose competitiveness was presumed to be at risk.

But eligibility for the discount scheme was not based on an analysis of how exposed firms were to international competition. Rather – primarily for legal reasons – eligibility was given to firms with polluting processes that were regulated under legislation passed prior to 2001 known as 'pollution prevention and control' (PPC).

The fact that emitters of conventional pollutants are the ones benefiting from the tax discount might not have been a problem of course if there were a strong overlap between the PPC-regulated firms and those potentially threatened by

Firms that enjoy a discount from the climate change levy do not face higher risks to their competitiveness

international competition. That is a question that our research has been able to investigate.

Using the management interview approach developed at CEP (Bloom and Van Reenen, 2007), we conducted interviews with managers in almost 200 UK manufacturing firms to gather information on many aspects of firm behaviour related to climate change

issues. The interviews were conducted as part of a larger survey of 800 firms in six European countries (Martin et al, 2011; Martin et al, 2012; Anderson et al, 2011).

On the basis of the survey, we constructed a number of firm-level scores. Figures 1 and 2 report statistics on scores that are indicative of whether a firm's competitiveness is at risk due to climate change policies.

Figure 1: The distribution of the downsizing risk scores for firms that pay the full climate change levy and those that benefit from the tax discount

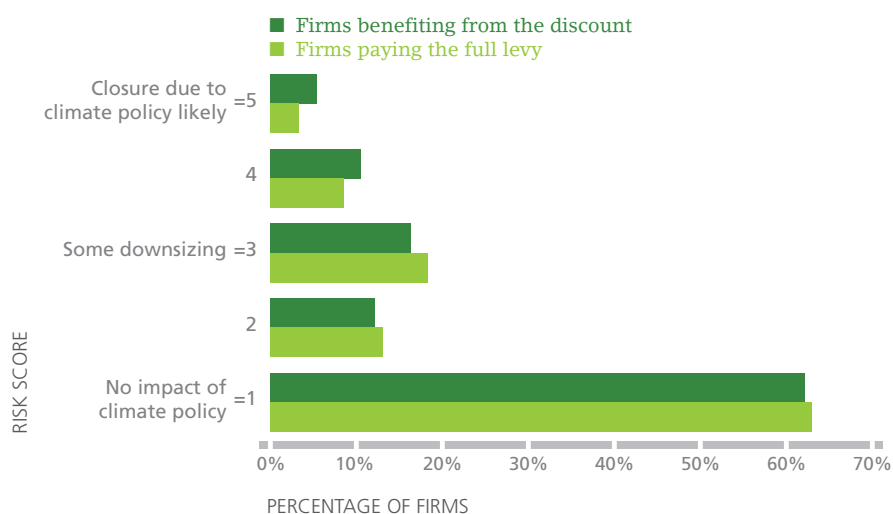


Figure 2: Cost pass-through and non-European Union competition for firms that pay the full climate change levy and those that benefit from the tax discount

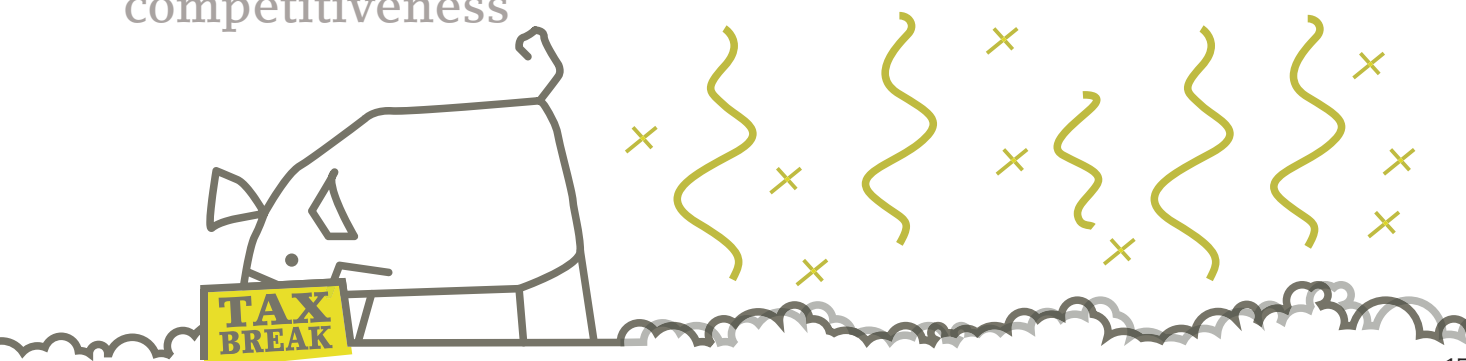
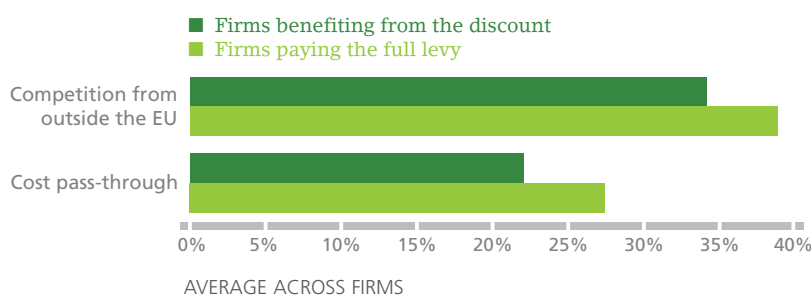


Figure 1 displays a score that is directly based on asking managers if they expect that their firms will downsize or indeed exit the UK (and Europe) due to climate change policies during the next 10 years. We see very little difference between firms that benefit from the tax discount compared with those that do not.

The same conclusion emerges when looking at the extent to which managers believe that they can pass on cost increases from the tax to customers in the form of higher prices ('cost pass-through') or when considering the share of foreign non-European Union competitors that a firm has (see Figure 2). If the competitiveness of firms eligible for the discount is at risk, we should see that they have lower cost pass-through rates, a higher share of overseas competitors or both.

Hence, the government's way of identifying firms whose competitiveness is at risk seems to be solidly off target. While this is deplorable from a policy point of view, it opens up a unique opportunity for researchers to examine if an energy tax such as the climate change levy has the negative impact that industry lobby groups claim.

Figure 1 indicates that roughly two in five managers report that climate change policy may have a negative impact on their firm to the extent that they expect to downsize or completely close down. But it is striking that these firms are fairly equally distributed between those that pay the full climate change levy and those that benefit from the tax discount.

A comparison of what happened to firms in the two categories following the 2001 introduction of the climate change levy should thus give us a good idea of the effects of such an energy tax. We turn to this next.

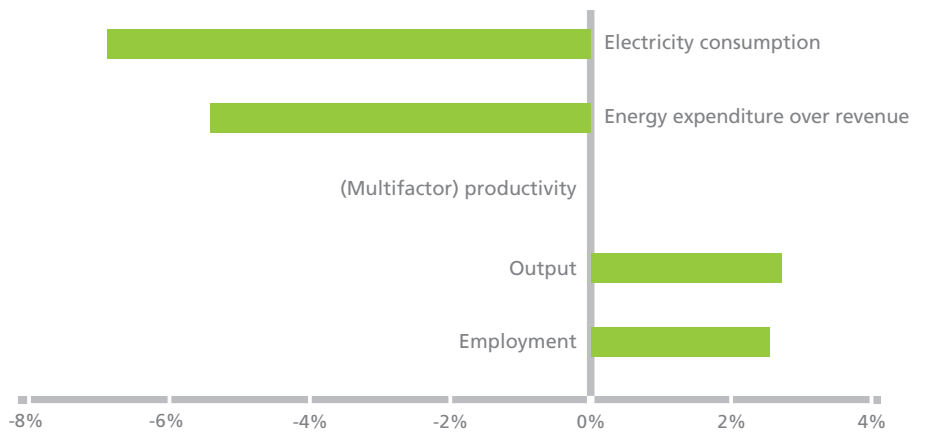
Figure 3 reports the average difference in growth rates of various firm-level outcomes between firms that are

eligible for the tax discount and those paying the full levy before and after 2001 (Martin et al, 2009). We see that the growth rate of employment as well as output in firms that were not eligible for the tax discount was on average more than two percentage points higher than in eligible firms.

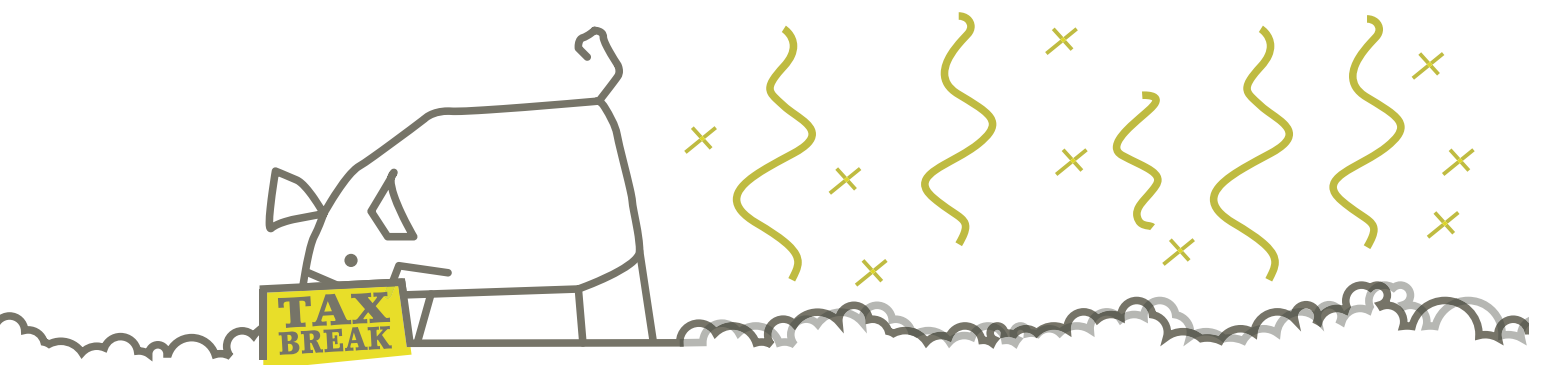
Similarly, there is no significant difference in terms of productivity. In further analysis, we have confirmed that there is no significant difference in plant exit either. If there were any impact on competitiveness, we would expect that

Firms that pay the full climate change levy reduce their energy use and their emissions by more than those that get a tax discount

Figure 3: Growth rate differential between firms that pay the full climate change levy and those that benefit from the tax discount



Note: Authors' calculations based on data from the Office for National Statistics.



firms without the tax discount would be contracting faster and would be more likely to exit.

We also repeated this analysis for different sub-samples in our data, for example, focusing on more energy-intensive firms, which might be expected to be more at risk. Again we find no evidence of negative effects on competitiveness.

In contrast, we do find significant differences when looking at the growth rate of firms' energy consumption, which is the target of a tax such as the climate change levy. Our results suggest that firms paying the levy in full reduce energy consumption at a rate more than 5% higher than firms benefiting from the discount (see Figure 3).

What are the implications of our results? First, there is no evidence that firms with the tax discount are facing higher risks to their competitiveness than firms that pay the full climate change levy. Moreover, we cannot find any evidence for negative effects on competitiveness. Not only does this suggest that the current system of granting discounts is badly targeted but also that there is no justification for the discount.

Second, firms that pay the full tax reduce their energy use and thereby their greenhouse gas emissions by more than beneficiaries from the discount. Thus, by granting discounts, the government is losing out twice: first, by missing out on tax revenues in the order of £350 million a year; and second, by achieving less in terms of reaching its targets on reducing emissions.

It would seem to be a no-brainer to abolish the discount and use the revenue in continuing efforts to plug the budget deficit. Alternatively, the extra revenue could be recycled back to firms via lower national insurance contributions, as has been the practice with much of the revenue from the climate change levy to date.

But the UK government has reached a different conclusion. Although the discount scheme was supposed to run out in April 2013, the government has recently decided to extend it until at least 2020. It is currently finalising the details of the legislation to bring it before parliament in September this year.

Ralf Martin, an assistant professor at Imperial College Business School, is a senior visiting research fellow at CEP. **Laure de Preux** is a research officer in CEP's programmes on productivity and innovation and wellbeing. **Ulrich Wagner**, an assistant professor at Carlos III University in Madrid, is a research associate in CEP's productivity and innovation programme.

Further reading

Barry Anderson, Jorg Leib, Ralf Martin, Marty McGuigan, Mirabelle Muûls, Laure de Preux and Ulrich Wagner (2011) 'Climate Change and Business in Europe: Evidence from Interviewing Managers', CEP Occasional Paper No. 27 (<http://cep.lse.ac.uk/pubs/download/occasional/op027.pdf>).

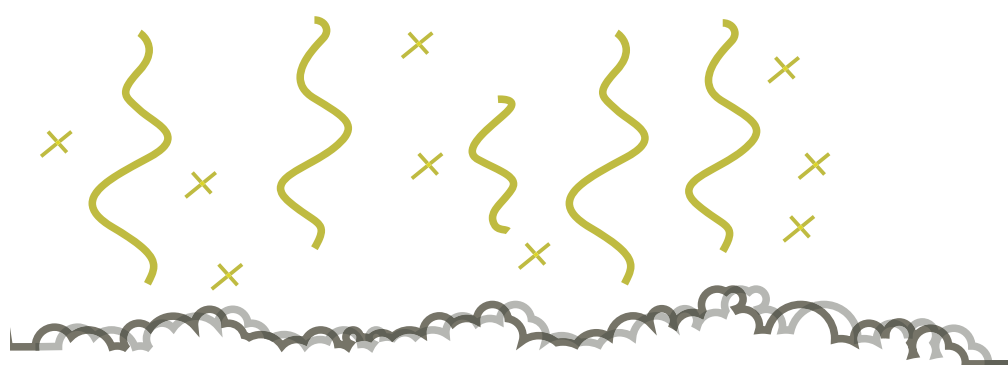
Nicholas Bloom and John Van Reenen (2007) 'Measuring and Explaining Management Practices Across Firms and Countries', *Quarterly Journal of Economics* 122(4).

Ralf Martin, Laure de Preux and Ulrich Wagner (2009) 'The Impacts of the Climate Change Levy on Manufacturing: Evidence from Microdata', CEP Discussion Paper No. 917 (<http://cep.lse.ac.uk/pubs/download/dp0917.pdf>).

Ralf Martin, Mirabelle Muûls and Ulrich Wagner (2011) 'Climate Change, Investment and Carbon Markets and Prices – Evidence from Manager Interviews', *Climate Strategies*.

Ralf Martin, Mirabelle Muûls, Laure de Preux and Ulrich Wagner (2012) 'Industry Compensation and Relocation Risk: A Firm-level Analysis of the EU Emissions Trading Scheme', forthcoming CEP Discussion Paper.

By granting discounts, the government is missing out on tax revenues and achieving less in reducing emissions



in brief...

Can industrial policy boost jobs?

Business support policies aimed at revitalising economically disadvantaged regions can be effective at raising employment, according to a team of CEP researchers. But government subsidies, such as Britain's 'grant for business investment', only seem to work when targeted at smaller firms.

The Great Recession has brought industrial policy back into fashion. Governments around the world have given huge subsidies to private firms, most dramatically in financial services but also in other sectors such as the car industry.

But business support policies are not new. Most governments grant investment subsidies that claim to foster employment and productivity, particularly in disadvantaged areas. In 2010, European Union (EU) countries spent €61 billion on aid that was unrelated to the financial crisis; and the United States spends around \$40-50 billion each year on local development policies.

Despite the ubiquity and cost of such schemes, rigorous evaluations of the effects of these 'industrial policies' on employment and productivity are rare. That is what we have done in an analysis of the impact of expenditure through Britain's 'regional selective assistance' (RSA) programme over a 20-year period.

We have examined every manufacturing plant in England, Wales and Scotland – over 2.3 million observations – comparing firms that did and did not get grants both before and after receiving government support. Because EU law changed over this 20-year period, some parts of Britain became eligible for subsidies and others saw their grants disappear, which makes it possible for us to work out the impact of investment subsidies on firm performance.

Our research suggests that government grants to smaller firms in economically disadvantaged areas of Britain *can* increase employment, but that grants to larger firms have no effect. The positive impacts on smaller

firms translate into wider area benefits, for example, reduced unemployment.

But the resulting increases in local manufacturing employment and reductions in unemployment come at a cost in terms of productivity. Specifically, because RSA grants support employment in lower productivity firms while having no impact on firm-level productivity, RSA lowers aggregate productivity by increasing the employment share of low productivity firms.

Our findings suggest a large effect of grants on small recipient firms: a 10% investment subsidy causes about a 7% increase in employment, with about half of this (3.6%) arising from growth in existing firms and half from firm entry. These effects are underestimated if analysis ignores the fact that the participants in the scheme are firms and areas that would otherwise perform badly.

So why are these positive employment effects confined to smaller firms, those with fewer than 150 workers? One possible explanation is that larger firms are more able to 'game' the system and take the subsidy without changing their investment and employment levels. Another possible explanation is that grants help to remove the financial constraints faced by smaller firms.

The wider impacts on employment and unemployment at the area level suggest that positive effects at the firm level are not just about shuffling jobs from nearby firms that do not receive financial support. In fact, the new jobs created appear to come mostly from the pool of unemployed workers in the area.



Grants to smaller firms can boost jobs but grants to larger firms are a waste of taxpayer money

Grants increase area-level employment but lower productivity, leaving firms potentially vulnerable in the future

So grants to firms in disadvantaged areas can support local employment. The policy is not costless, however, considering the negative effect on productivity.

Overall, then, our results are mixed news for advocates of firm-level grants to turn around disadvantaged areas. While these policies can increase area-level employment, they lower productivity, leaving firms vulnerable in the future (which may partly explain why firms and areas keep coming back for more support).

As always with these types of policies, careful economic analysis suggests that there is no 'free lunch': firm grants can raise employment, but at a cost in terms of productivity that goes beyond the purely financial implications of supporting investment in the first place.

This article summarises 'The Causal Effects of an Industrial Policy' by Chiara Criscuolo, Ralf Martin, Henry Overman and John Van Reenen, CEP Discussion Paper No. 1113 (<http://cep.lse.ac.uk/pubs/download/dp1113.pdf>).

Chiara Criscuolo is a research associate in CEP's productivity and innovation programme.

Ralf Martin, an assistant professor at Imperial College Business School, is a senior visiting research fellow at CEP. **Henry Overman** is director of the Spatial Economics Research Centre. **John Van Reenen** is director of CEP.



Do natural resource windfalls increase the risk of armed conflict within a country?

Yu-Hsiang Lei and Guy Michaels

investigate the impact of giant oilfield discoveries on the likelihood of civil conflict.

Giant oilfields and civil conflict



Ancedotal evidence from Angola, Iraq and Nigeria suggests that discoveries of natural resource wealth in a country can make civil conflict more likely. What's more, recent research (for example, Besley and Persson, 2011) has shed light on the mechanisms underlying some of these conflicts over resources. But as the examples of Brazil, Canada and Norway demonstrate, not *all* oil-rich countries experience internal conflicts.

Careful surveys of research on conflicts and natural resources (for example, Ross, 2006, and Blattman and Miguel, 2010) show how difficult it has been to quantify the effect of oil on armed conflict in all but a handful of countries. The goal of our research is to examine whether giant oilfield discoveries really do fuel internal armed conflicts around the world – and if so, in which settings.

To investigate this question, we would ideally want oil windfalls to appear as if in a randomised controlled trial. But in reality, of course, oil-rich countries differ from oil-scarce ones in ways that are difficult to observe and measure. Using data over time to control for fixed differences across countries is not straightforward either, because both the amount of oil extracted and its price may themselves respond to conflict.

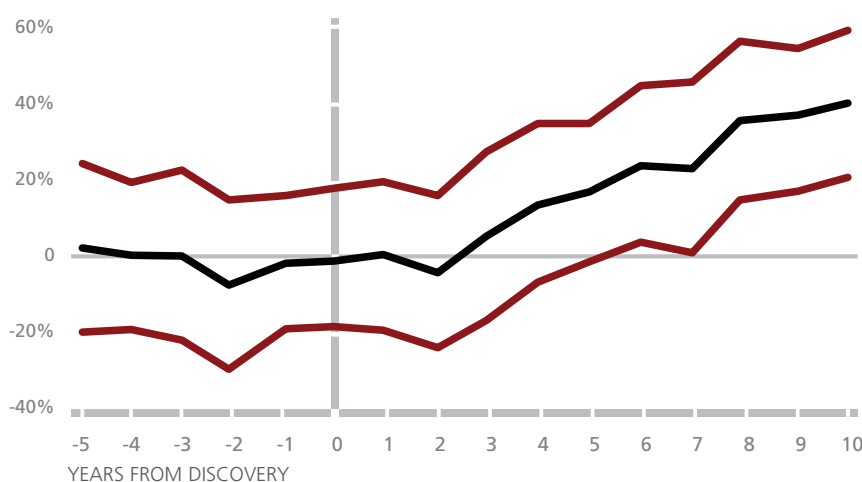
To overcome this challenge, we focus on the discovery of giant oilfields (and natural gas reserves) since the Second World War, each of which contained recoverable reserves of 500 million barrels equivalent or more before extraction began. As we discuss below, we find evidence that the timing of these discoveries is largely down to chance, so we can interpret the events that follow them as the causal effects of the discoveries.

Our first finding is that, on average, oil production increases by about 35-50% within a few years of a giant discovery. Giant oilfield discoveries also increase oil exports by about 20-50% within just a few years (see Figure 1).

We also find that, on average, giant oilfield discoveries increase the incidence of internal armed conflicts by about 5-8 percentage points within four to eight years of discovery, compared with a baseline probability of about 10% (see Figure 2).

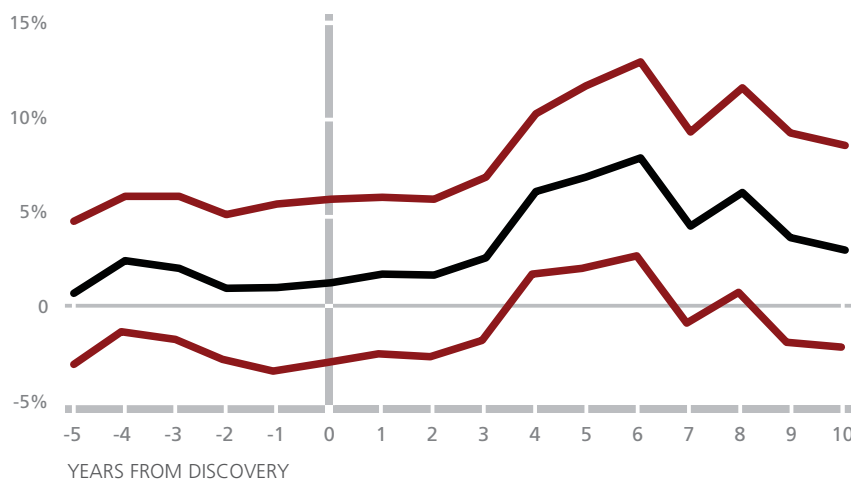
Giant oilfield discoveries, which are largely down to chance, significantly increase the risk of civil conflict

Figure 1:
The effect of giant oilfield discoveries on per capita oil exports



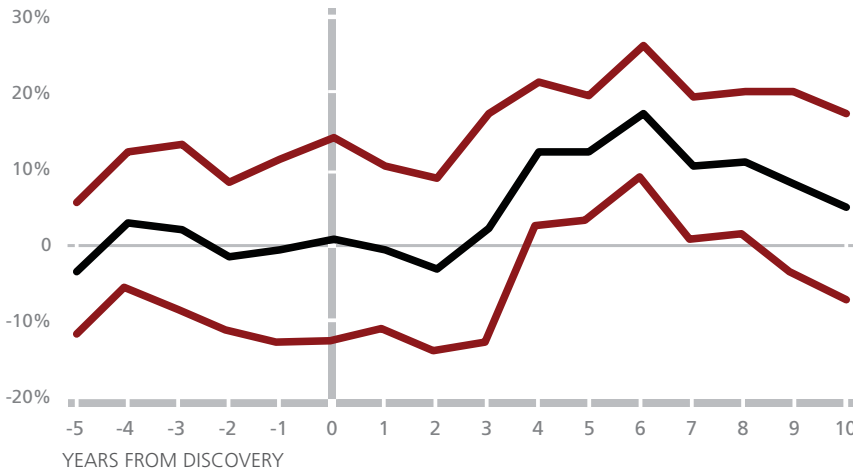
Note: Point estimates in black and 95% confidence intervals in red.

Figure 2:
The effect of giant oilfield discoveries on the incidence of internal armed conflicts



Note: Point estimates in black and 95% confidence intervals in red.

Figure 3:
The effect of giant oilfield discoveries on the incidence of internal armed conflicts in countries with at least one internal armed conflict in the previous decade



Note: Point estimates in black and 95% confidence intervals in red.

The discovery of giant oilfields is especially likely to fuel internal conflicts in countries with recent histories of political violence. For example, giant oilfield discoveries increase the incidence of internal armed conflict by about 11-18 percentage points (compared with a baseline probability of about 37-39%) when a country experienced at least one such conflict in the decade prior to discovery (see Figure 3).

Similarly, the effect of discovery on the incidence of internal armed conflict is 11-14 percentage points (compared with a baseline probability of about 19-20%) in countries that experienced at least one coup in the decade prior to discovery. By contrast, in countries that experienced no internal conflicts or coups in the decade before a discovery, there is no significant effect of giant oilfield discoveries on the incidence of internal armed conflicts.

Turning to the effect of giant oilfield discoveries on economic outcomes, we find that GDP per capita and government spending either increased modestly or remained unchanged within the decade following a giant oilfield discovery. Our evidence also suggests that such discoveries did not affect private

consumption or investment. In other words, most residents gained little, if anything, from the discoveries.

If we could be confident that the timing of giant oilfield discoveries within countries is random, then we could interpret what follows them as the causal effect of these discoveries. While we recognise that the search effort is not completely random, we argue that the precise timing of discoveries within each country is largely a matter of chance.

To see why, consider how important giant oilfields are as a global source of oil and natural gas. These giants account for over 40% of the world's oil and natural gas reserves, so their discoveries are economically significant events. If a country or a firm could be fairly certain that a search will turn up a giant oilfield, then they will probably conduct the search.

But in fact, giant oilfield discoveries are very rare. Averaging across all the countries in the world, the odds of a giant discovery in a given year is less than one-in-twenty. The fact that these events are

so rare suggests that even when search effort is involved, the precise timing is due less to planning than to chance.

Our research provides additional evidence that addresses some potential concerns about the timing of the discoveries, and supports our interpretation that it is plausible to think that timing is random.

First, we address the concern that the discoveries may have resulted from economic or political changes that preceded them. We find no evidence of significant economic or political changes in the five years leading up to giant oilfield discoveries or in the year of discovery itself. We also test whether discoveries follow lulls in prior conflicts, and find no evidence to support this hypothesis.

Second, we tackle the concern that finding one giant oilfield may lead to finding another one nearby. While it is true that giant oilfield discoveries in a

Conflict over oil is especially likely in countries with recent histories of political violence

country's recent past increase the odds that it finds one in a given year, controlling for these past discoveries leaves the findings essentially unchanged.

Our results are also robust to excluding observations within a decade or less of previous giant discoveries. Observations with giant oilfield discoveries account for only about 1% of the remaining sample, making them especially difficult to anticipate.

Third, we address concerns that economic or political conditions shortly before discovery may affect our estimates, by showing that our results are robust to controlling for institutional quality and aggregate private investment.

Finally, we tackle the concern that observations with oil discoveries are different from others in ways that are difficult to measure directly. To do so, we compare the effect of giant oilfield discoveries with the effect of smaller

oilfield discoveries, and find that our results still hold.

Our finding that giant oilfield discoveries fuel internal conflicts in countries prone to violence has important implications for policy. For example, those who strive to reduce armed conflict should be concerned about the windfalls from oil that incumbent governments obtain in conflict-prone areas, especially if those windfalls encourage challenges to the incumbent's power.

At the same time, the firms that prospect for oil in conflict-prone areas and those who regulate them ought to be concerned about negative consequences for many local people. Locals often have little to gain from giant oilfield discoveries but may suffer enormously from conflicts over the oil.

This article summarises 'Do Giant Oilfield Discoveries Fuel Internal Armed Conflicts?' by Yu-Hsiang Lei and Guy Michaels, CEP Discussion Paper No. 1089 (<http://cep.lse.ac.uk/pubs/download/dp1089.pdf>).

Yu-Hsiang Lei is an occasional research assistant in CEP's labour markets programme.

Guy Michaels is a lecturer in economics at LSE and a research associate in CEP's labour markets programme.

Further reading

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Michael Ross (2006) 'A Closer Look at Oil, Diamonds, and Civil War', *Annual Review of Political Science* 9: 265-300



In conflict-prone areas, windfalls from oil discoveries may well encourage challenges to the incumbent government's power

in brief...

Two cheers for Anglo-Saxon financial markets?

Institutional investors are good for industrial innovation, according to a study by CEP's director **John Van Reenen** and colleagues.

The increasing dominance of pension funds, mutual funds and other institutional owners in the US and UK stock markets has been a positive force for industrial innovation and growth over the past 30 years, according to a recent study that I have conducted with Philippe Aghion of Harvard and Luigi Zingales of Chicago.

Our research indicates that publicly traded companies in which institutional investors have raised their equity stake will increase their innovation. These large companies have dispersed ownership so no individual has much of an incentive to keep an eye on the chief executive officer (CEO).

We suggest that the positive role of institutional investors is because of their greater incentive and ability to monitor companies' performance. They can offer a kind of job insurance to CEOs who are prepared to take a chance on risky, but potentially rewarding, longer-term investments.

At a time when deregulated financial markets are under attack from many quarters, it is rare to hear any positive words for some aspects of the Anglo-Saxon financial model. Even before the financial crisis, the takeover of the stock market by institutions – pension funds, hedge funds, mutual funds and the like – was condemned for breeding a bias against long-term investments in innovation. Whereas Japanese and German research and development (R&D) created better cars, it was said, British and Americans specialised in producing better quick-fix derivatives of no long-term value.

Our study takes a contrary position, arguing that the rise in institutional ownership – from under 10% in the 1950s to over 60% today – has actually been a positive force for innovation and growth. We look at publicly traded US corporations that were responsible for the bulk of private sector R&D over the past 40 years and track what happens when institutions increase their equity share.

Analysing data on the accounts and patenting activity of 803 publicly traded US firms from the mid-1970s to the early 2000s, we find that a greater role for institutional investors is followed by a burst of innovation in future years as indicated by patents (weighted by citations to reflect their importance), R&D and productivity.

This does not seem to be because institutions are better at predicting future breakthroughs, as the burst of innovation occurs even after events that increase institutional investors' role, such as policy changes favouring investor activism and gaining membership of the S&P 500 index of the US stock market (which boosts institutional ownership).

We argue that institutions have a greater *incentive* to monitor top managers than individual owners as they typically have larger blocks of company shares. They also have a better *ability* to monitor managers as they own shares in many companies and know how to set up better systems for keeping an eye on CEOs.

Publicly traded companies in which institutions have raised their equity stake increase their innovation



Institutional investors offer job insurance to CEOs who make risky but potentially rewarding investments

Monitoring might improve incentives for innovation because lazy managers are forced to put in more effort rather than lazing around on the golf course or the ski slopes of Davos. This would imply that the impact of institutional investors is stronger when managers are more entrenched due to weak competition or protection from takeovers.

In fact, we find that the role of institutions is greater when managers are less entrenched, so we prefer an explanation based on 'career concerns'. Innovation is a risky business, so top managers fear that they will be fired if they take a chance by investing in innovation and things turn out badly through no fault of their own. By gathering more information on managerial quality, institutions offer some insurance to CEOs who are prepared to take a chance on risky, but rewarding, investments.

One test of our career concerns theory is to look at CEO firing. Poor profitability performance is often followed with the abrupt booting out of the incumbent CEO. But our research shows that decreases in profit – which may not be the sole fault of the CEO – are less likely to cause a firing when institutional investors are stronger. This is in line with the view that institutions give some insurance protection to managers and encourage them to take on more risky innovation.

Since innovation is the engine of growth, the institutional ownership that characterises the Anglo-American financial system clearly has long-run benefits. These benefits should not be regulated away in the current backlash.

This article summarises 'Innovation and Institutional Ownership' by Philippe Aghion, John Van Reenen and Luigi Zingales, CEP Discussion Paper No. 911 (<http://cep.lse.ac.uk/pubs/download/dp0911.pdf>) and forthcoming in the *American Economic Review*.

Philippe Aghion is at Harvard University. **John Van Reenen** is director of CEP. **Luigi Zingales** is at the University of Chicago.

HIP



Hooray!

in brief...

UK chief executives: paid for performance?

Is there any clear relationship between corporate performance and executive remuneration? To explore this question, **Brian Bell** and **John Van Reenen** have created a new database of pay for senior executives and employees in 400 UK firms.

Recent figures indicate a resurgence in the growth of executive pay in the UK at a time of austerity for most. Anger at these numbers is driven in part by a growing belief that such pay bears little relationship to how the companies managed by these chief executive officers (CEOs) actually perform. In other words, the argument goes, there is pay for no performance.

To shed more light on whether there is any link between the pay of top business people and the performance of their firms, we have created a database of pay for CEOs, senior executives and employees covering over 400 UK firms over the period since 2001. These firms account for about 90% of UK stock market capitalisation.

This is the first time that data covering everyone from the CEO to the cleaners in a large sample of firms has been collected and linked to stock market performance in this country. It makes it possible to explore how pay changes across a whole company as its performance improves or worsens.

As might be expected, we find that there are big differences in average pay. CEOs earn around 40 times more than the average employee, but this multiple rises to around 80 when we look only at the very top companies – the FTSE 100. The majority of pay for CEOs comes from bonuses and stock incentive plans, whereas 95% of employees' pay comes from basic salary.

Our evidence also shows that when corporate performance improves, so does pay. But pay goes up much more for CEOs than for ordinary employees. For example, if the firm's value as measured by shareholder returns increases by 10%, CEOs on average get an extra 3% in pay while employees get only 0.2% more.

This close pay-for-performance link among CEOs seems to be a fairly new development. Evidence from the 1980s and early 1990s found almost no link between pay and performance for top executives. Our research shows that today's correlation between pay and performance is driven by bonuses and other incentive packages, which have become more important in recent years.

We also find that poorly performing firms are much more likely to boot out their CEOs, and that when a firm does

badly, CEO pay goes down. But it is worth noting that CEO pay cuts for failure are not as speedy as pay increases on the upside. So although it is true that CEOs are not just 'rewarded for failure', they get more pleasure when the company's performance goes up than pain when performance goes down.

Of course, these average effects of performance on pay cover both well-governed firms that use pay to provide incentives for their CEO and poorly performing firms that pay over the odds for questionable talent.

Finally, we demonstrate that there is a strong relationship between how tightly firms link CEO pay with performance and how significant institutional investors are among the firms' shareholders. For firms with low levels of institutional ownership, we find no link between pay and performance in general, although CEOs in such firms do benefit when performance is good.

In contrast, firms with high levels of institutional ownership are more successful at linking pay and performance, and ensuring that the link works in both good times and bad times. This all suggests that active and large shareholders can provide an important disciplining influence on the structure of CEO pay.

What are the implications for policy? We think that there are strong grounds for encouraging more transparent reporting of pay by companies. Many annual reports are unnecessarily complicated in their reporting of executive pay and, perhaps inadvertently, tend to obscure the size and nature of the pay awards.

We also think that there should be a requirement for each and every board to explain to shareholders and the public how the growth in pay of their CEO is linked to the performance of the company. Those that fail this test must be held to account by shareholders.

This article summarises 'Firm Performance and Wages: Evidence from across the Corporate Hierarchy' by Brian Bell and John Van Reenen, CEP Discussion Paper No. 1088 (<http://cep.lse.ac.uk/pubs/download/dp1088.pdf>).

Brian Bell is a research fellow in CEP's productivity and innovation programme. **John Van Reenen** is director of CEP.

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INFRASTRUCTURE, ENERGY AND GROWTH

Speakers: Steven Fries, David Newbery and Bridget Rosewell
Wednesday 23 May 2012, 2pm, CEP

MANAGEMENT AND GROWTH

Speakers: Ian Davis and John Van Reenen
Monday 28 May 2012, 3pm, venue to be confirmed

DRIVING GROWTH THROUGH SCIENCE, ENGINEERING AND INNOVATION

Speakers: Ayman Asfari, Jon Moulton and Keith O'Nions
Wednesday 30 May 2012, 10am, venue to be confirmed

DRIVING GROWTH THROUGH SCIENCE, ENGINEERING AND INNOVATION

Speakers: Ian Shott and Sir Andrew Witty
Thursday 28 June 2012, 4pm, CEP

For more information, visit the LSE Growth Commission website:

<http://www2.lse.ac.uk/growthcommission>

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