

# Centre Piece

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## UNIVERSITY ECONOMICS

- Incentives for invention and technology transfer
- The booming labour market for graduates
- Reforming higher education in Europe

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# CentrePiece

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## Editorial

What contribution do universities make to innovation, productivity and long-run economic growth? At the core of their activities are two 'products': scientific research and graduates. And as is made clear in the government-commissioned review of the UK's science and innovation system, led by Lord Sainsbury and published in early October alongside the comprehensive spending review, both of these outputs are essential for sustaining and improving the nation's economic performance.

This issue of *CentrePiece* explores some of the central policy concerns facing institutions of higher education and their political masters. Nick Butler makes the case for universities to have greater independence and resources. Stephen Machin and Sandra McNally note shortages of graduates in key subjects, notably science, engineering and technology. And Mark Schankerman raises questions about the institutional framework for scientific endeavour and the commercialisation of new inventions through licensing to the private sector – so-called 'knowledge transfer'.

Knowledge transfer has been central to the work of the Centre for Economic Performance (CEP) since its inception – though the long track record of CEP influence is more evident in the world of public policy. Stephen Nickell's account here of his time on the Bank of England's Monetary Policy Committee demonstrates this wider social impact of economic research, in terms of the transfer of both people and ideas.

Perhaps less well known is the Centre's involvement in knowledge transfer to the private sector. Business-supported research initiatives include the Manpower Human Resources Laboratory and a programme on new technology and productivity sponsored by EDS. And last year, CEP collaborated with McKinsey & Company on a second survey of management practices covering thousands of firms in Europe, Asia and the United States, the first results of which are summarised here.

CEP's research on and with the private sector tends to have a long-run focus through the generation of ideas and new

policies, such as changes in competition policy stimulated by Stephen Nickell's work in the mid-1990s. One recent example is a study of regulation of Europe's mobile phone industry described in this *CentrePiece*.

Research reported in the previous issue examines the European Commission's recently concluded case against Microsoft. The court ruling that the software giant had abused its monopoly power – and the careful use of economic arguments in support of this view – is an example of the effects that the output of universities can have on innovation, particularly in the high-tech industries that the Sainsbury review is keen to promote.

As always, your feedback on *CentrePiece* is welcome. And do pass the magazine onto colleagues – whether they're in a university or making use of the core products of universities.

**Romesh Vaitilingam**  
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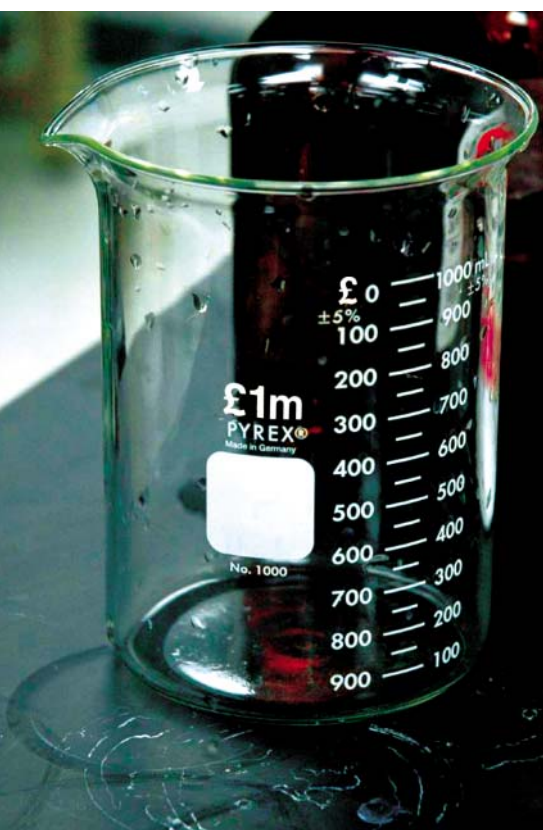
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# Harnessing success: incentives for invention and technology transfer in universities

Universities are a key source of the new scientific knowledge that drives long-run economic growth. But what are the incentives for scientists to generate commercially valuable inventions and for university managers to license such technologies to the private sector? Research by **Mark Schankerman** and colleagues investigates.



**P**erhaps the greatest long-term productivity advances come through breakthroughs in basic knowledge – and a substantial proportion of the research and development (R&D) that creates new knowledge and leads to increased productivity is done in universities.

University research not only raises the productivity of private sector R&D (through ‘knowledge spillovers’) and encourages more of it to be done; it also leads to inventions that can be commercialised, either through licensing to private firms or via the formation of new start-up companies.

Such ‘technology transfer’ by universities has grown dramatically in the past two decades, particularly in the United States. Between 1991 and 2004, the number of US university patent applications rose from 1,584 to 10,517, and licensing income increased from \$218 million to \$1.4 billion (which is 6% of federal R&D financing for universities).

European and Asian universities are less involved in this form of technology transfer but are rapidly expanding their activities.

The rapid growth of technology transfer in the United States is in part due to the Bayh-Dole Act of 1980. This piece of legislation not only gave universities the right to patent new discoveries but also mandated them to license inventions made with federally sponsored research to the private sector. Now, nearly all US research universities have a technology licensing office and explicit intellectual property policies and royalty-sharing arrangements for their scientists.

## Analysing technology transfer

In essence, technology transfer involves two distinct activities: innovation by university scientists and commercialisation by the university’s technology licensing office (see Figure 1). In the first stage, scientists produce both publications and inventions. The mix of these two may be influenced by the incentive of money,

either for themselves directly or as enhanced funding for their research laboratories. Other incentives – such as promotion and tenure rules, and intrinsic motivation to do basic and applied research – are also likely to play a role.

The second stage is the commercialisation of inventions by the technology licensing office, which decides whether to patent and license inventions, identifies licensees and structures contracts. The effectiveness of the technology licensing office is likely to be influenced by the university's objectives, government constraints on licensing and incentives given to its managers.

Our research programme is studying

the role of incentives and other institutional features that can make the process of technology transfer more effective. Given the importance of research for long-term growth, it is critical to understand what drives scientific endeavour and technology licensing activity.

Is research a purely intellectual pursuit driven by intrinsic motivation, or do economic incentives play a role in the way that scientists structure their work? What are the most appropriate incentives for managers in technology licensing offices? And how is technology transfer performance influenced by whether a university is private or public (and hence constrained by government objectives) and the degree to which it chooses, or is obliged, to promote local and regional development? Our research programme explores all of these questions.

### Royalty incentives for scientists

In a study with Saul Lach, I use US data (as similar data are not yet available in Europe) to examine how the share of licensing royalties from university inventions received by academic inventors (their 'cash flow rights') affects the number and licensing value of inventions in universities.

Our central finding is that incentives are effective: universities that give greater royalty incentives do much better in terms of licensing income from technology transfer. This works both by inducing greater effort by researchers and through 'sorting' of the most productive and entrepreneurial scientists into high-royalty universities. We also find that royalty incentives have a much larger impact in private universities than in public ones, and technology licensing activity is more commercially effective in the former.

In the United States, universities usually claim exclusive ownership ('control rights') over inventions made by their scientists. But the cash flow rights from licensing inventions are typically shared between the inventor and various parts of the university according to specified royalty-sharing schedules. There is substantial variation in these arrangements across US research universities, which makes it possible to estimate their effect on inventive output.

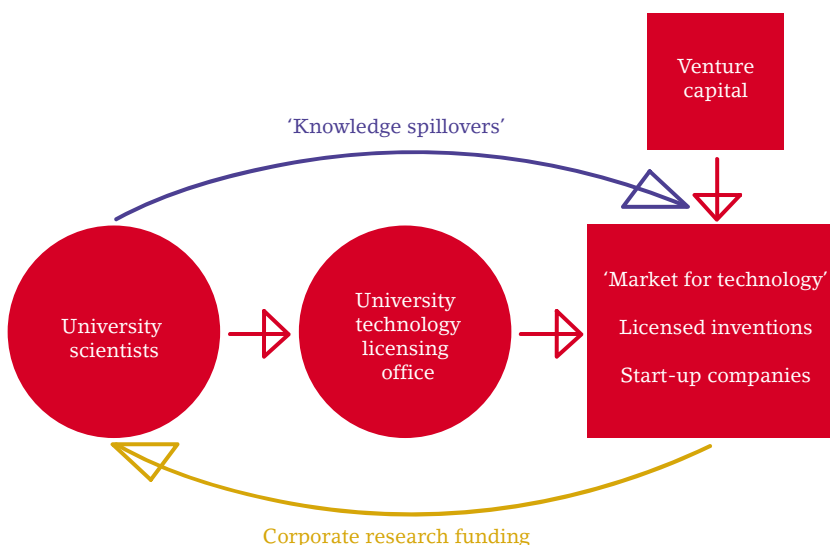
Our study focuses on two outcomes – licensing income and the number of inventions disclosed by faculty scientists to technology licensing offices – using data from the Association of University Technology Managers, combined with information on the distribution of royalty shares for 102 US universities during the period 1991-99.

The novel aspect of the data is the information on the distribution of licensing income between the university and the inventor(s). The inventor retains a given percentage of net licensing income and the rest is allocated to the inventor's laboratory, department and college and to the university. Our criterion for identifying the inventor's share is that the inventor must gain either cash flow rights or must have direct control rights over the income (for example, lab research money).

In about half the universities, these royalty shares vary with the level of licensing income generated by an invention ('non-linear royalty schedules'). The average inventor's share is 41% among the 58 universities using linear royalty schedules, but there is substantial variation: the minimum inventor royalty share is 25% and the maximum 65%. The royalty shares in the 44 universities with non-linear schedules display even larger variability: the average royalty share is 51%, but the minimum is 20% and the maximum 97%.

# Scientists are motivated by both love of research and potential monetary rewards

Figure 1: University-private sector science links



Another striking feature is that in every university, inventor royalty shares are either constant or decline with the level of licensing income per invention. On average, they start at 54% and decline to 30% for inventions generating over \$1 million. Royalty shares are also unrelated to various characteristics of the universities, such as faculty size, academic quality and the number of technology licensing office professionals per faculty.

Among the more detailed findings of our research:

- Academic research and inventive activity in universities respond to variations in inventors' royalty shares. Controlling for a variety of factors – including university size, quality and R&D funding – universities with higher royalty shares generate higher levels of licensing income. This finding is important because it implies that the design of intellectual property rights and other forms of incentives in academic institutions can have real effects.
- Inventors respond both to cash royalty share and to royalties used to support their research labs (when the scientists have direct control over their use). Thus, both high-powered monetary incentives and intrinsic motivation seem to play a role. This is relevant to the design of university royalty-sharing arrangements. For example, non-science faculty may view generous payments to support research labs as less objectionable than direct cash payments to the scientists.
- The incentive effects of royalty-sharing work both by inducing greater effort by scientists and through sorting of scientists across universities so that the

most productive and entrepreneurial scientists tend to work in higher royalty universities.

- The response to incentives is much larger in private universities than in public ones. If universities do not expect a strategic reaction from their competitors, the research indicates that in most private universities, and in about half the public ones, the incentive effect is strong enough to produce a 'Laffer effect', where raising the inventor's royalty share actually increases the license revenue retained by the university (net of payments to inventors).
- But when universities expect competing universities to match changes in their royalty share, the benefits to the universities of raising inventors' royalty shares will be smaller. Thus, high-powered, invention-based incentives are important, but so too is the strategic behaviour among universities in setting these incentives.
- Technology licensing offices are more productive in private universities, suggesting that private institutions have more effective, commercially-oriented technology transfer activity.

### Incentives for technology licensing offices

Why might university ownership affect technology transfer performance? In a study with Sharon Belenzon, I combine evidence from surveys of US universities' technology licensing offices with panel data on licensing performance to address this question.

Whereas previous research has shown that technology transfer performance is influenced by university characteristics and other factors, including university ownership (public versus private), academic quality, local (high-tech) demand conditions and licensing contract design, our study focuses more on the 'black box' of productivity within the technology licensing office. We examine three key determinants of technology licensing productivity – performance pay; local development objectives; and government constraints on licensing activity – combining new survey data with panel data from public sources on 86 US universities for the period 1995-99.

The survey data show that universities' two main objectives are generating licensing income and promoting local and

regional development, the latter goal being more prominent in public universities. Institutions that view local economic development as one of their primary functions might perform differently from those that exclusively pursue income maximisation.

Public universities are also more affected by the imposition by state governments of a variety of constraints – both statutory restrictions and informal political pressure – on their licensing activity. Our study quantifies the impact of incentives and measures the implicit cost of these constraints and of concentrating on local development objectives by estimating forgone licensing income.

We find that technology licensing offices in private universities are much more likely to adopt incentive pay for their staff than those in public institutions. But ownership does not affect the licensing performance of the technology licensing office once the use of incentive pay is controlled for. From a policy perspective, this means that it might be possible to get 'private performance' from public institutions if the right incentives are introduced.

These incentives certainly matter: we find that technology transfer performance is strongly influenced by whether a technology licensing office uses performance-based pay for their staff.

We also find that technology transfer performance is affected by the extent to which there is a preference for developing licensing activity locally rather than more widely, and by formal and informal constraints imposed by government. Universities with a stronger local development focus earn far less licensing income from a given pool of inventions. This raises important policy questions about the right balance between income maximisation and local development focus in technology licensing activity.

Among the more detailed findings of our research:

- Compared with technology licensing offices in public universities, those in private universities are significantly more likely to use performance-based pay. Among the private universities surveyed, 79% use some form of incentive pay as compared with only half of the public universities.
- Performance pay has strong incentive

## The incentive effect of royalty-sharing for scientists is much larger in private universities



## Universities with a stronger local development focus earn much less licensing income

effects. Universities that use bonus pay generate, on average, about 30-40% more income per license, after controlling for other factors.

- While private ownership has a large, positive effect on the adoption of incentive pay, ownership has no independent effect on licensing performance, once we have controlled for whether the university has adopted incentive pay.
- Private universities are much less constrained in their freedom of operation by state laws and regulations, and are more likely to be focused on generating licensing income compared with more 'social' objectives such as promoting local and regional development.
- Local and regional development objectives are 'costly' in terms of forgone license income. Universities with strong objectives of this kind generate, on average, about 30% less income per license, after controlling for other factors. State government constraints also reduce license income.

The finding that local development objectives are costly in terms of the forgone license income raises an important policy question. There are two economic arguments for having a preference for local licensing. First, pure knowledge spillovers have a tendency to be geographically localised. Second, the

**Royalty incentives for scientists need to be combined with performance incentives within technology licensing offices**

new economic geography literature emphasises that growth can be stimulated by agglomeration effects working through various supply and demand linkages.

But by showing that there is an opportunity cost of promoting local development in this way, our research highlights the importance of comparing this approach with an alternative policy of maximising income from university inventions (with no preference for local development) and using the additional license income generated to finance local economic development in other ways – for example, through lower business taxes or direct subsidy programmes.

### Conclusions

Many countries, in Europe and beyond, are increasingly concerned about how to promote more effective technology transfer and other forms of research collaboration between universities (and other public research organisations) and the private sector. Clear ownership rights, incentives and a clear definition of the objectives of technology transfer are key elements of that process.

Our research makes a contribution to that public debate by showing that the benefits to universities are strongly affected by how incentives are set and by identifying characteristics of technology licensing offices that influence the effectiveness of royalty incentives.

One caveat applies to all this work. Our findings contribute to the policy debate about the effectiveness of university licensing activity, but they are not a cost-benefit analysis of the 'commercialisation' of universities. Many scholars have expressed concerns about the potential costs of these developments, including the threat to established norms

of 'open science' and the potential redirection of research away from fundamental science. While there is only limited evidence of such costs thus far, continuing vigilance is needed to ensure that they do not get out of hand.

Important challenges for research and policy remain:

- How should the 'market for technology licensing' best be structured, and what role, if any, should government have in that process?
- Should universities have monopoly control over the inventions of their scientists, as they currently do, or should the scientists be free to market their inventions through other channels?
- Should the use of market-based patent and licensing intermediaries be allowed (while preserving the sharing of cash flow rights between the scientist and the university)?
- How much geographic specialisation should there be (for example, should universities join into regional technology transfer offices, as in some countries like Germany?) and should such offices specialise in particular scientific disciplines?
- In short, how should the market in technology transfer be structured to exploit most effectively the economies of scale and informational advantages in these activities?

This article draws on research reported in 'Incentives and Invention in Universities' by Saul Lach and Mark Schankerman, CEP Discussion Paper No. 729 (<http://cep.lse.ac.uk/pubs/download/dp0729.pdf>) and 'The Impact of Private Ownership, Incentives and Local Development Objectives on University Technology Transfer Performance' by Sharon Belenzon and Mark Schankerman, CEP Discussion Paper No. 779 (<http://cep.lse.ac.uk/pubs/download/dp0779.pdf>).

**Mark Schankerman** is professor of economics at LSE and director of CEP's research programme on productivity and innovation. **Saul Lach** is professor of economics at the Hebrew University of Jerusalem. **Sharon Belenzon**, a CEP research associate, is a postdoctoral research fellow at Nuffield College, Oxford.

# Higher education and the labour market





Higher education around the world has expanded rapidly in recent years, yet graduates continue to command a wage premium in the labour market. So, as **Stephen Machin** and **Sandra McNally** show, there are no problems of 'over-supply' or 'over-qualification' – rather there are 'shortages' in some fields, which further expansion could alleviate.

**I**n recent decades, there has been rapid expansion of higher ('tertiary-level') education across many countries. This has had important and profound effects on labour markets and the way in which employers use highly educated labour.

These expansions have, for the most part, been predicated on the assumption that more education is good for individuals and for society as a whole, not only in terms of economic outcomes like wages or employment, but also for a wide range of social outcomes like improved health, reduced crime and higher well-being.

But along with expansion of the system has come a range of new questions that have emerged as a consequence of there being many more graduates. Is there now 'over-supply' of graduates? Is there evidence of 'over-qualification' and skill mismatch? Are students studying the 'right type' of subjects? And is there a shortage of science and technology graduates in particular?

In a recent report, we review the evidence on these questions. The report offers some conclusions about the way in which the expansion of higher education has had important effects on economic outcomes – and draws policy implications for the future.

### The increasing supply of graduates

The labour market consequences of increasing supply can be considered within a simple demand and supply framework. Starting from a position where the demand for and supply of graduates are in balance, a boost in the supply of graduates should, other things being equal, lead to a reduction in the wage premium because employers have a wider range of similarly qualified people to

choose from. But if, for whatever reason, employers demand more graduates, then the wage premium may not fall.

The wage premium depends on the interaction of demand and supply. In recent decades, there has been a big increase in both the demand for and supply of graduates. It is the fact that demand has outstripped supply that has given rise to an increasing wage premium for a university degree. There is much controversy about the reasons for increasing demand for graduates, but the predominant view is that 'skill-biased technological change' is a major contributory factor.

In most countries, there has been continued expansion of higher education in the last decade. But the wage premium attached to higher education has increased in most of them. The exceptions are Spain and New Zealand – two countries with particularly large expansion of higher education in the last 10 years – and Korea, where the wage premium declined markedly between 1974 and 1990, a period of industrialisation when there was massive growth in higher education.

But even in these three countries, there is still a positive return to higher education. Thus, it makes little sense to speak of 'over-supply' of higher education. The strong, positive and (often) increasing

return to higher education suggests that 'under-supply' is more of an issue and that continued expansion is justified. In terms of employability, in many countries, there has been some catch-up of less educated groups over the last decade, but graduates continue to have a much higher probability of being in a job.

### Mismatches and shortages

Nevertheless, it sometimes takes a long time for some (usually less well performing) graduates to find jobs after leaving higher education and even then, some are not in jobs that appear to be well matched to their qualifications. At the same time, there are shortages in certain sectors: this is evident in employer surveys and in some data analysis that shows a negative wage premium associated with 'skill mismatch'.

A body of research has attempted to measure these outcomes, and the (sometimes misused) terms of 'over-education' and 'under-education' have emerged: the former arises if an individual holds higher qualifications than required by his or her job whereas the opposite applies for the 'under-educated'. But statistics on over- and under-education are difficult to interpret as workers are matched to jobs based on a range of characteristics and not just their education

Concerns about the 'over-supply' and/or 'over-qualification' of graduates are misplaced

level. What's more, apparent mismatch may be a temporary phenomenon.

The extent to which such problems are seen as temporary varies across studies and countries. But one generalisation that can be made is that the fact of observing 'over-qualified' individuals in the workforce does not mean that there is over-supply of graduates. If there were over-supply, relative wages and employment probabilities would fall to the level of their closest substitutes – and this has not happened.

The indications are that skill mismatch (or inadequate levels of skill) is more of a problem than over-qualification. In some countries, there is a need to improve the content and accreditation of vocational qualifications so that they provide what employers need and are recognised to do so.

This is not to say that higher education should be geared to providing highly specific skills that are currently needed by employers. Some studies suggest that general education and skills are more valuable because they enable workers to respond to shocks to the economy (for example, those that require sectoral change) and advances in technology.

## Degree subjects

One hypothesis put forward to explain skill shortages is that individuals are not choosing the right type of graduate studies (whether this education is general/academic or vocational). In other words, the choice of higher education made by individuals does not correspond to the needs of the labour market in terms of field of study.

As yet, there are relatively few studies that estimate returns to higher education by subject of degree – especially when we are most interested in change over time. One study looks at changes in returns to subject of degree over time in Britain, Germany, France and the United States, and finds that a return to an arts degree had the lowest relative return within all countries, for two time periods (the early 1990s and 2000) and for both men and women.

In contrast, the returns to degrees in science, engineering and technology are substantial (especially for men). Such findings are broadly consistent with what is found for a number of other countries – science/engineering/technology is often



**Just because there are over-qualified individuals in the workforce does not mean that there is over-supply of graduates**

among the category of subjects with a relatively high return (along with some social science subjects and professions such as law and medicine) whereas arts and humanities are often among the category of subjects with a relatively low return.

So it may be relevant to talk of graduate over-supply in relation to some subjects of degree. For example, there have been estimates to suggest that the wage return to an arts and humanities degree is zero in Britain.

This raises the question as to why people continue to pursue such qualifications. There are various possible explanations: one is that wages do not capture important aspects of the 'value' of

the degree for individuals – for example, higher education has a 'consumption' value as well as a value in the labour market; and jobs have non-pecuniary aspects that make them attractive to individuals. Second, students may not be well enough informed about the likely returns to subject of degree.

## The value of science degrees

The existence of the relatively high wage differential for science/engineering/technology compared with other subjects illustrates the high value placed on the field by employers and indicates high relative demand for graduates with this field of study. This might be interpreted as a 'shortage' of science and technology graduates and would be consistent with some reports of 'shortages' that have appeared in several countries, including Australia, Belgium, Britain and New Zealand.

There are big differences between countries in the proportion of graduates who qualify with a degree in science and technology. Comparing across continents (using data from 2000), Asia has the highest percentage of graduates with science and technology degrees (32%), which is just above Europe (28%) and considerably above North America (18%), South America (22%) and Oceania (22%).

Within Asia, China has a particularly large share of graduates with a degree in science and technology (53%). Even though the EU has a better performance than the United States in terms of producing science and engineering graduates, it lags well behind the United States in terms of the proportion of science and technology researchers in the labour market. Nevertheless, as in other countries, there are claims of a 'shortage' in the United States, which economists have struggled to reconcile with the facts (which belie this concern).

Further analysis suggests that the underlying issue is that the United States maintains an adequate supply of scientists and engineers only because of the sizeable influx of foreign-born students and employees. This could be a risk to US research if there is any interruption of the flow of immigrant scientists and engineers.

The 'brain drain' to the United States is also a concern for other countries. For example, analysis of migration flows in

and out of Europe suggests that Europe has lost out in terms of its own potential supply of 'domestic' graduates and its ability to attract scientists and engineers from other countries. The shortage of personnel in these areas is likely to have costs in terms of innovation and consequent productivity growth.

### Conclusions and policy implications

While concerns about over-education are largely misplaced, there do appear to be problems with graduates not always having the skills required by employers. One response to this is to make sure that vocational courses meet the requirements of employers and to ensure that the accreditation system is appropriate.

But it would be unwise to emphasise acquisition of highly specific skills at the expense of general education. This is a challenge for whole educational structures not just higher education since, in many countries, students have to make a decision between general and vocational education long before they reach the stage of entering higher education.

There is also a question of the balance between employer-provided training and education provided by institutions of higher education. Employers have a role in addressing concerns about skill mismatch. And governments have an important role in improving information about training opportunities, setting appropriate legal frameworks and ensuring portability of skills.

Potential policy responses to the variation in returns to higher education by subject include differential fees (or bursaries) by degree subject so that graduates are encouraged to study subjects for which there is high relative demand in the labour market. There may also be a case for the provision of better information to potential students on job prospects and earnings by degree subject.

More generally, given the positive relationship between education and economic growth, and the fact that returns to higher education are strongly positive, there is a good argument for continuing to expand higher education.

This could be achieved by public provision of more places in higher education. Where capacity constraints are not the issue, then an important matter for investigation is why more



In many countries, there is relatively higher demand for graduates in science, engineering and technology

young people do not pursue higher education. One possibility is the cost both in terms of fees and the opportunity cost (the earnings students – and possibly their families – must forgo while in higher education). Where such constraints exist (most likely for students from poor social backgrounds), there is a good case for bursaries.

Another possibility is that there is insufficient information available to potential students about the returns that might be gained from pursuing higher education (or returns in certain subject areas). In this case again, the appropriate policy response would be to provide this information at appropriate stages of an individual's education.

Skill mismatch – or inadequate levels of skill – is more of a problem than over-qualification

The article summarises 'Tertiary Education Systems and Labour Markets' by Stephen Machin and Sandra McNally, a report prepared for the OECD.

The full report is available here: <http://www.oecd.org/dataoecd/55/31/38006954.pdf>

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in brief...

## Europe's universities – time for reform

Knowledge is an increasingly critical factor in shaping economic life – but across Europe, the institutions that should be the main sources of knowledge are failing to meet the challenge. Guest contributor **Nick Butler** outlines what must be done to improve the quality of higher education in the European Union.

With a few honourable exceptions, the universities of Europe are failing to provide the intellectual and creative energy that is required to improve the continent's relatively poor economic performance. Too few of them are world-class centres of research and teaching excellence. Many are desperately short of resources. Some are shamefully poor in every sense and can barely provide what most objective observers would understand to be an education of quality.

The picture is not uniformly bleak. The UK and some of the Nordic countries have increased funding in recent years. Countries such as Austria, Denmark and the Netherlands have greatly improved the way their universities are run. The UK has some of the best research universities in the world, thanks in good measure to the relative autonomy of its institutions and to the way that research funding is allocated – on the basis of peer-reviewed excellence as opposed to the whims of central government or the need to spread limited resources evenly across every region.

But European institutions are not well placed to compete in what has become a global competition for talent. In countries such as France, Germany and Italy, the sector is struggling to cope with too many students, and delivering uninspiring teaching in dilapidated buildings. Across Europe as a whole, higher education is crying out for reform in six important areas.

The first concerns control and independence. Universities need the autonomy necessary to manage their own affairs in an efficient fashion. Universities that are effectively agencies of the state – as is in effect the case in France and Italy – have very little control over their resources and are unable to set relevant academic priorities.

Throughout Europe, including the UK, there is a powerful case for universities to be more independent – even if government remains the main purchaser of services – including both teaching and research. This is not about 'privatisation' in the sense of institutions being sold to the highest bidder. It is rather about universities seeking and earning the freedom necessary to transform what one observer has called the last major nationalised industry.

Second, higher education needs to be properly funded. The European Union (EU) countries currently invest about 1.2% of their GDP in this area. A figure nearer to 2% would be required to make the EU an effective competitor with the best in the world.

The important difference between Europe and just about every other developed economy is that private finance plays a very modest role in its university funding. Thus, public funding for higher education represents about 1% of GDP for the EU countries, roughly the same proportion as in the United States. But private funding for US universities amounts to a further 1.4% of GDP and the average in OECD countries is 0.8%, compared with only 0.1% for Europe.

If the quality is to be maintained and improved, and Europe's students are to earn degrees worth the parchment on which they are printed, European governments will sooner or later have to introduce tuition fees. These should be backed by strong systems of maintenance grants to ensure that access is open to all and that students can afford to sustain three or four years of study.

The UK has started the process and Germany is moving in the same direction. The political challenge to the status quo in France will be enormous. As many British and American universities can testify, increasing numbers of the best young French people are already voting with their feet, seeking an international education beyond the stultifying constraints of the ancient regime at home.

Third, European countries are going to have to become much more selective in the way they allocate resources. There are nearly 2,000 universities in the EU, most of which aspire to conduct research and offer postgraduate degrees. By contrast, fewer than 250 US universities award postgraduate degrees and fewer than 100 are recognised as research-intensive.

Given this concentration of resources, it is no wonder the United States dominates the league tables of the world's best research universities. Europe needs to devote its available research budget – at national and EU level – on the basis of peer-reviewed



excellence. Research funding should not be a cover for regional policy.

Selectivity is also important when it comes to accepting students. World-class universities have to be free to pick their own talent rather than to take what comes – as happens now in large parts of Europe. Without some test of merit and potential, universities will remain simply a device for disguising unemployment numbers, as is the case in parts of southern Europe.

The fourth area concerns the curriculum reform. This is already under way in more than 40 countries across the continent, through what is known as the Bologna process. The idea is to establish easily recognisable and comparable degrees based around a two-cycle system of studies, starting with a bachelor degree and moving on to a masters. The UK, with its own traditions, has barely embraced the process, but change is coming and more British universities need to engage and to experiment in this area.

Fifth, Europe needs to develop a much more diverse system of higher education. Rather than attempting to make them all equal, the aim should be to create a rich mix of institutions – some offering world-class teaching and research, others concentrating on regional or local needs. Germany recognises this challenge with its plans to fund a small group of elite institutions, as do the best of the new generation of universities in the UK, which are developing their own specialisms and breaking free of the need to mimic Oxbridge.

Finally, in pursuing this agenda of excellence through diversity, a creative mix of funding is necessary – to reward talent, research and teaching; to stimulate entrepreneurial development; to encourage experimentation; and to

## Throughout Europe, there is a powerful case for universities to be more independent

enable universities to reach out to meet the rapidly growing global need for education. Much of this funding will come from government, but universities also need to develop their own funding streams, and to see themselves as self-standing institutions.

Diversity will be one of the principal benefits of a break from the nationalised past. As freestanding organisations, universities will be able to find their own distinctive capabilities.

Universities may seem slow to change, but history suggests that over time they do reflect the needs of the societies of which they are part. Change in higher education must be part of a much wider reform of the entire education system – providing ladders of opportunities; developing talents concealed by poor family backgrounds and language difficulties; and offering second and third chances for men and women to revisit the process of education through their lives.

Universities are part of that wider process and vital to its success. Their development and their capacity to respond to the challenges facing Europe will be a crucial leading indicator of the EU's success in the fiercely competitive environment of the twenty-first century global economy.

## Europe needs a much more diverse system of higher education with a creative mix of funding

**Nick Butler** is Director of the Cambridge Centre for Energy Studies. He is co-author with Richard Lambert (a member of CEP's policy committee) of *The Future of European Universities – Renaissance or Decay*, published by the Centre for European Reform in 2006.

Image: Lindsay Beyerstein



# What drives good management around the world?

It has long been suspected that bad management plays a key role in explaining the UK's productivity gap with the United States and some of our European neighbours. CEP's global survey of over 4,000 firms suggests that there is indeed a 'management gap' – and reveals the forces driving variations in the quality of management practices.

**T**he exploits of David Brent in the television series *The Office* have made bad British management practices infamous around the globe. But these failings have a far longer historical pedigree. The Harvard business historians Alfred Chandler and David Landes have both claimed that poor management practices held back British companies. In 1947 as part of the Marshall Aid scheme to revive post-war Europe, American businessmen and engineers concluded that 'efficient management was the most significant factor in the American advantage'.

But how do British firms now compare in terms of management practices, not only with the United States and continental Europe but also with the rising industrial giants of India and China? Until recently economists have had little to say about the role of management in driving productivity and other key performance indicators. This is largely because there has been an absence of good quality data on management practices. Working in partnership with McKinsey & Company, CEP has been carrying out a large research project that attempts to fill this void.

We have developed an original survey method to measure management practices in a systematic way in more than 4,000

firms in Europe, the United States and Asia. By combining these data with firm accounts and industrial statistics, we are able to explore in detail the relationship between management practices, the economic environment and company performance.

Overall, we find compelling evidence that better management practices are significantly associated with higher productivity and other indicators of corporate performance, including return on capital employed, sales per employee, sales growth and survival. This is true in every country we look at, suggesting that our characterisation of good management practice is not culturally biased towards 'Anglo-Saxon' approaches.

We estimate that management practices can account for up to a third of the differences in productivity between firms and countries. Why are there such startling differences in the management practices and productivity of competing companies? Our research offers some potential explanations for these differences and suggests areas where policy can encourage the spread of good management practices.

## Measuring management practices

Measuring management requires us to codify the concept of good and bad

## So you think manufacturing is boring...

During the summer of 2006, we interviewed over 4,000 managers. Some of these individuals were extremely colourful characters, providing endless entertainment to the research team with their comments immortalised on our team quotes board. Some of our favourites included:



## Talent rewards the Indian way

Interviewer:

*How do you identify your star performers?*

Indian plant manager:

*This is India. Everyone thinks he is a star performer.*

# management

management into a measure applicable to different firms. We used an interview-based management practice evaluation tool that defines and scores from 1 (worst practice) to 5 (best practice) across 18 of the key management practices that appear to matter to industrial firms, based on McKinsey's expertise in working with thousands of companies across several decades. The 18 practices fall into four broad areas:

- Shopfloor operations: have companies adopted both the letter and the spirit of lean manufacturing?
- Performance monitoring: how well do companies track what goes on inside their firms?
- Target setting: do companies set the right targets, track the right outcomes and take appropriate action if the two don't tally?

- Incentive setting: are companies hiring, developing and keeping the right people and providing them with incentives to succeed?

For each company in the study, researchers interviewed by telephone one or two senior plant-level managers, who knew only that they were taking part in a 'research' project. These managers were selected because they are senior enough to have a reasonable perspective on what happens in a company but not so senior that they might be out of touch with the shopfloor. The interviews relied on open questions and the interviewers were trained to probe for details of practices on the ground.

The interviews were run by an international team of 47 postgraduate students (mainly MBAs), who worked from CEP in a specially created survey centre



## The British chat-up

Male production manager:

*Your accent is really cute and I love the way you talk.*

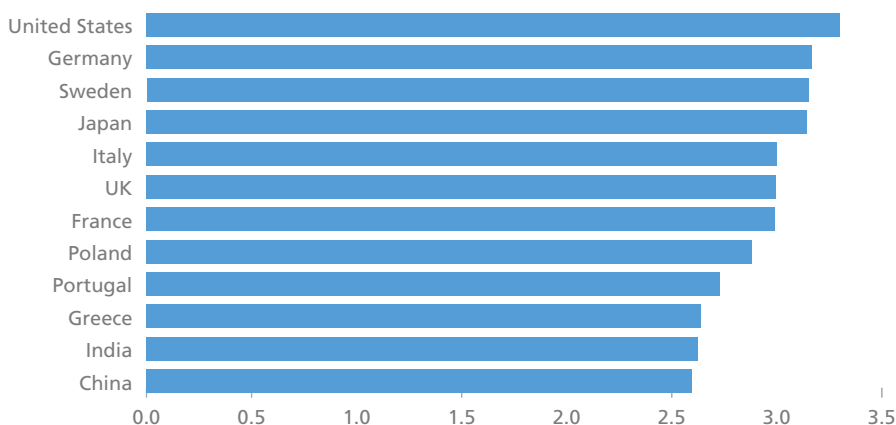
*Do you fancy meeting up near the factory for some fun?*

Female (Australian) interviewer:

*That's a great offer – how could I refuse? Unfortunately, I'm washing my hair every night for the next three months.*

Figure 1:

US firms are the best managed, followed by the Germans and Swedes, with the Greeks, Indians and Chinese the worst



The bars indicate for each country the average score on the 18 management questions (1=worst practice, 5=best practice).

Strong competition and flexible labour markets both lead directly to improved management performance

during the summer of 2006. This was a 24-hour operation since the Chinese day starts at midnight in London, just before managers on the West Coast of the United States pack up to go home.

### Management practices around the world

As Figure 1 shows, there are significant differences in management performance across countries. The United States is at the top of the management league table, while Greece, India and China are the worst performers. Germany, Sweden and Japan are (not surprisingly) strong performers given the manufacturing focus of the survey, while France, Italy and the UK are all solidly mid-table.

But the United States is not entirely dominant. US firms score particularly highly for people management, such as promoting and rewarding talented workers quickly. But as Figure 2 shows, in shopfloor operations management, Sweden, France, Italy, Japan and Germany do relatively better.

Overall, cross-country differences account for only 9% of the variation in management practice. Performance differences between companies in the same country are far larger than any cross-country variation. For example, the best third of Indian companies outperform the European average. This is worrying for

those who complacently assume that vastly superior Western management protects them from offshoring.

### Managers are very poor at self-assessment

Since good management is strongly linked with good performance, why do so many firms fail to make a priority of improving their practices? The techniques are pretty well known yet many firms remain poorly managed.

To examine possible causes of this disconnect, we asked managers as a final question in the interview to assess the overall management performance of their firm on a scale of 1 to 10. To avoid false modesty, they were asked to exclude their personal performance from the calculation.

As Figure 3 indicates, interviewees' answers to this question are not well

Multinationals tend to achieve excellent management practices wherever they are located



### Americans on geography

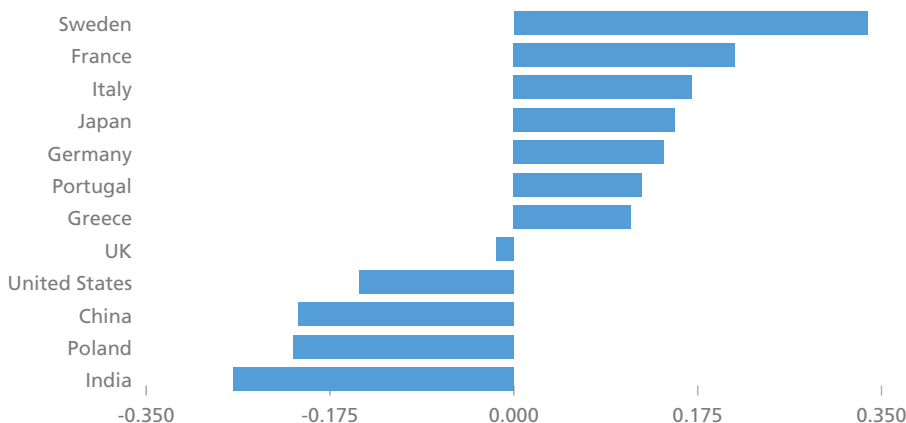
Interviewer:

*How many production sites do you have abroad?*

Manager in Indiana:

*Ummm... well... we have one in Texas...*

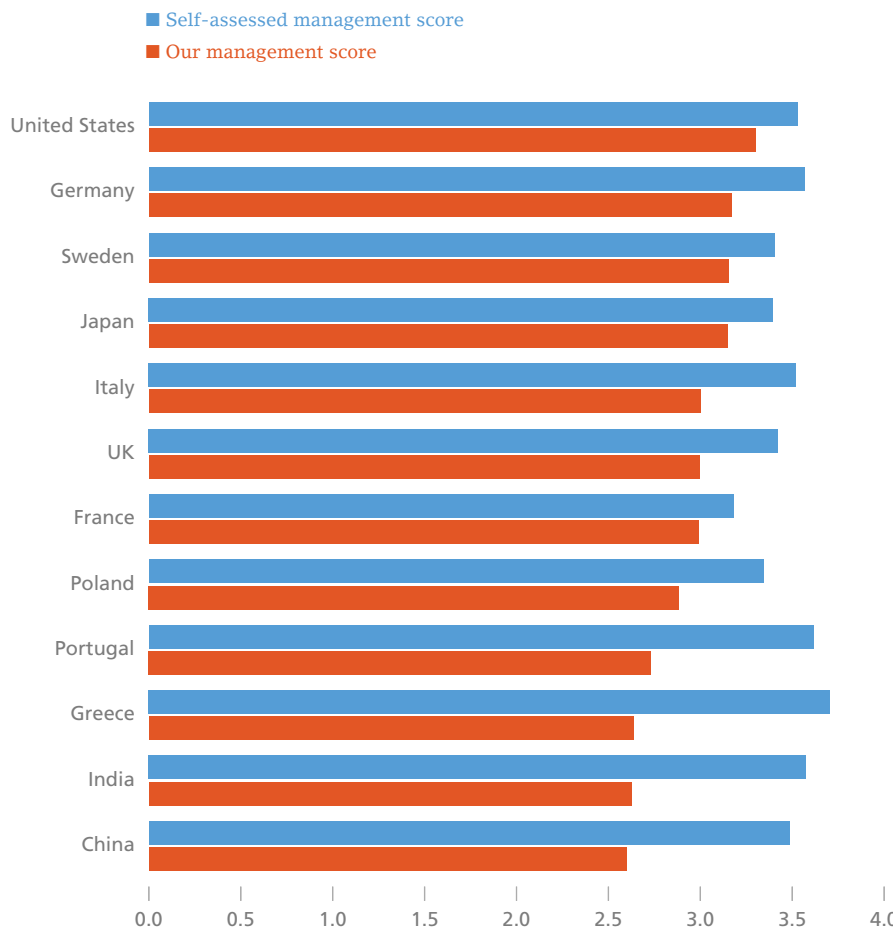
Figure 2: European firms are relatively better at operations management than people management



The bars indicate for each country the average score on six questions focused on operations management minus the average score on six questions focused on people management.



Figure 3:  
Managers are over-optimistic about their own management practices across the globe



The bars indicate for each country the average score on the 18 management practice questions and the average score on the self-assessed management question: 'Excluding yourself, how well managed is your firm on a scale of 1 to 10, where 1 is worst practice, 10 is best practice and 5 is average'. The scores are divided by 2 to put them on the same scale as our management scores.

correlated with either our management practice score or their own business performance. At the country level, we find Greek, Portuguese and Indian managers to be the most over-optimistic about their management practices, while the Japanese, Swedish and French managers are the most pessimistic.

### Government policy plays an important role

A variety of policy factors have an effect on companies' adoption of good management practices. Most significant among these are their competitive environment and the flexibility of the local labour market.

When competition (whether measured by narrow industry profit margins, trade openness or number of rivals) is higher, management is better. This could be a result of two effects: first, good practice spreads quickly in highly competitive environments; and second, poor practice is eliminated by Darwinian natural selection as poorer performing companies are removed from the marketplace.

We also find that flexible labour markets matter, since these appear to allow companies to adopt better people management practices. In countries with rigid employment laws (using the World Bank's index), firms find it difficult to implement effective hiring, promotion, retention and firing practices.

The high position of the United States in the management league table is helped by its competitive product markets and flexible labour markets.



### The difficulties of defining ownership in Europe

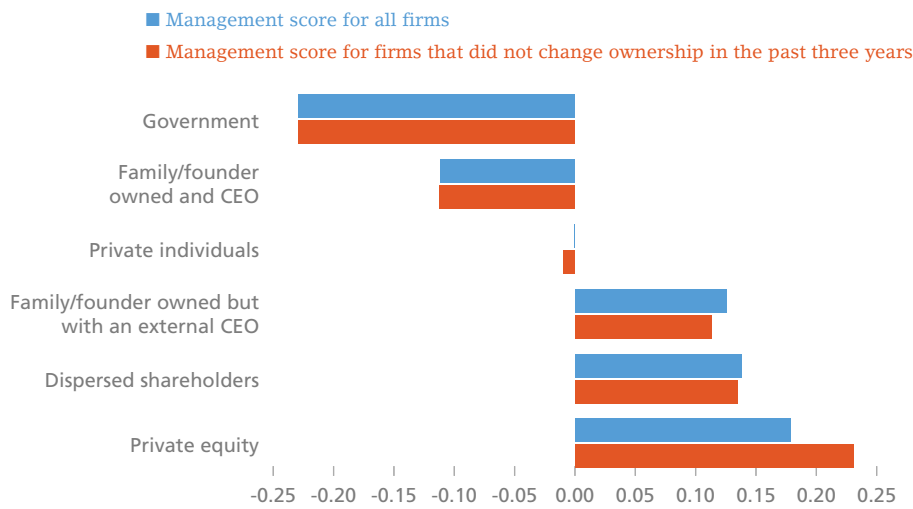
Production manager:

*We're owned by the Mafia.*

Interviewer:

*I think that's the 'Other' category... although I guess I could put you down as an 'Italian multinational'.*

Figure 4:  
Management scores are highest for private equity owned firms



The bars indicate for each type of firm ownership the deviation from the country and industry average score on the 18 management practice questions. The scores are for domestic firms only, of which there are 2,385 in the sample. The red bar for each type of ownership only includes the 2,180 firms that have had the same ownership for the past three years. The number of firms for the blue/red bar are as follows: government (53/53); family/founder owned and CEO (1,185/1,082); private individuals (364/285); family/founder owned and external CEO (153/145); dispersed shareholders (624/566); and private equity (64/37).

### Private equity, public gain

One particular ownership form that appears to be linked with superior management practices is private equity. As Figure 4 shows, private equity firms are the best managed. This superior performance of private equity appears to be quite robust – they come out on top both with and without controls for country and industry.

One possible explanation is that private equity firms only buy well-managed firms so that their high management scores simply reflect their ability to cherry-pick the firms that they buy. But the usual story of private equity buy-outs is the reverse: they buy badly managed firms with the aim of turning them around. This suggests that their

management scores are more likely to be biased downwards by having recently purchased badly run firms.

To investigate this we re-plotted the management scores for only those firms that have had the same ownership for at least the last three years and found that doing this increases the lead of private equity firms over all other firms, making them the best managed in the sample.

### Multinationals, family ownership and skills

Firm ownership and the availability of skilled people, both in management and among the workforce in general, are also associated with important differences between the better-managed firms and the rest.

For example, multinational companies are well managed around the globe, achieving extremely good management practices in countries like Greece and India despite the poor management practices of local domestic firms.

Family ownership and the traditional practice of *primogeniture* – handing down the CEO position to the eldest son – are associated with particularly bad management practices (see Figure 4). This appears to be an issue for Europe

The best-managed firms are those with three or more years of private equity ownership



### Employee retention the old-fashioned way:

Company chairman:  
*Sex is a great thing! If I can get my employee a local girlfriend he'll never leave.*

### Family owned firms that appoint the eldest son as the CEO are particularly badly managed

since in France, Greece, Italy, Portugal and the UK, around 10% of the manufacturing firms are family owned with a CEO that has been chosen because they are the eldest son. The United States performs much better on this dimension, with only 2% of its firms being family owned with the CEO chosen because he is the eldest son.

The skills of both the managers and non-managers in the firm also appear to play an important role. For example, 84% of managers in the highest scoring firms are educated to degree level or higher, as are a quarter of the non-management work force. Among the lowest scoring firms, by contrast, only 54% of managers and 5% of the wider workforce have degrees.

### What can the government do?

Our research shows a significant management gap between the UK on the one hand and the United States and some European countries on the other. This is a situation that the government can modify by encouraging the uptake of good management practices.

Our research suggests that strong competition and flexible labour markets both lead directly to improved management performance. Multinational companies have a strong positive effect too, and their influence is felt throughout the countries in which they operate. In these respects, the British government has a good track record and it is in other European countries that these lessons need to be taken on board.

The UK performs less well in the areas of skills and family ownership. British levels of basic education are low by international standards, and any policies that addressed this would have a big impact. As regards family ownership, there is currently a distortion in the inheritance tax system that actually promotes the continued ownership of privately held manufacturing firms in family hands, keeping these out of private equity ownership.

Our research suggests that by appointing managers on the basis of primogeniture rather than competitively on the basis of merit, we are possibly promoting more bad management and productivity practices in the UK.



### The things we did to get interviews

French secretary:

*You want to talk to the plant manager? There are legal proceedings against him, so hurry up.*

More details on this research can be found in 'Management Practice and Productivity: Why They Matter' by Nick Bloom, Stephen Dorgan, John Dowdy, Christos Genakos, Raffaella Sadun and John Van Reenen, July 2007 ([http://cep.lse.ac.uk/management/Management\\_Practice\\_and\\_Productivity.pdf](http://cep.lse.ac.uk/management/Management_Practice_and_Productivity.pdf)).

For full details of the survey methodology, including all the questions, see 'Measuring and Explaining Management Practices across Firms and Nations' by Nick Bloom and John Van Reenen, CEP Discussion Paper No. 716 (<http://cep.lse.ac.uk/pubs/download/dp0716.pdf>) and forthcoming in the *Quarterly Journal of Economics*.

The research was jointly funded by the Advanced Institute of Management Research, the Anglo-German Foundation, the Economic and Social Research Council and the Kauffman Foundation.

**Nick Bloom** is an assistant professor of economics at Stanford University and a research associate in CEP's productivity and innovation programme. **Christos Genakos**, a research associate in CEP's productivity and innovation programme, is at Cambridge University. **Raffaella Sadun** is a CEP research economist. **John Van Reenen** is director of CEP.



## in brief...

# Ozonomics

Australia's extraordinary period of prosperity has allowed the incumbent government to position themselves as economic superheroes. But as **Andrew Charlton** warns in a new book, we should always adopt a sceptical attitude to any politician's claims about their contribution to national economic success.

The most popular misconception in economics and politics is that if the economy is humming along, the government must be doing a good job – it must be a capable economic manager and its policies must be working.

When the economy is booming, politicians encourage the public to believe that they tightly control the economy. The idea that they hold the fortune of the nation in the palm of their hands appeals to them, and they want the public to take the strong economy as evidence of their skill and omnipotence.

The media too are susceptible to this fiction because we like to have someone to blame for our hardships and praise for our success – heroes and villains make good stories.

The truth, however, is that politicians have much less control over the economy than they would have us believe. Certainly, there can be policy successes and policy failures, but more often than not the condition of the economy is determined by factors outside the control of politicians.

The economy is much like a little boat in a wide sea. Whether the trip is calm or rocky depends much more on the weather and the wash from the bigger boats than anything that might be done internally. If the weather is bad, you cannot blame the skipper for the bumpy ride. In fact, unless you know a lot about sailing, it's hard to know whether the skipper is doing a good job in bad circumstances or whether he's making it worse.

The same is true of skippering the economy. If you ask people about the state of their economy in the last five years of the global boom, they will remember the low

unemployment rates, the low inflation, the low interest rates and the general mood of affluence that suffused the world. Incumbent leaders have generally turned this prosperity into stunning electoral success.

But most people are much sketchier on the following question: 'Which of our leader's policies, if any, can actually be shown to have produced the boom for which he has received so much credit?' This question is critical to the issue of whether a government's leadership is responsible for the prosperity it presided over – or whether that prosperity was produced by the policies of previous governments or the influence of benign international economic forces.

In Australia, the incumbent conservative government has benefited from an extraordinary period of prosperity, one that makes even the recent success of the British economy look modest by comparison. Australia has had 16 years of continuous expansion during which its wealth has doubled, labour productivity increased by a half and jobs increased by a quarter so that unemployment is at a 33-year low of 4.3%.

Australians have generally chosen not to think too hard about where this prosperity has come from. They have richly rewarded Prime Minister John Howard at the ballot box without looking too closely at causes and effects.

But a more accurate analysis of different governments' contribution to Australia's 'miracle' economy involves recognising that economic policies act with a lag, so the prosperity reaped today may have been sown many years before.

In Australia the battle for the title of 'better economic

## Letting politicians take credit for a booming economy distorts the public debate about economic policy



## Economic success is a complex combination of long-term policies and global circumstances

manager' has become one of competing narratives. Howard and his finance minister Peter Costello, backlit by the conspicuous boom, have an obvious advantage over the Labor Party's story, which is unflatteringly silhouetted against the recession they presided over.

Labor says its macroeconomic framework in the 1980s and microeconomic reform in the 1990s created the bedrock for later success and that the recession was the price to be paid for progress.

In contrast, the conservatives say the Howard government's decisions to pay down the national debt and deliver budget surpluses have directly produced the long boom. Howard has taken credit for the prosperity and used it to position himself as an economic superhero deserving of complete trust from the electorate.

Every government's claims about the economy deserve thorough scrutiny because what we believe about the foundation of our wealth makes a great deal of difference to how we should pursue our future. If, as our leaders would have us believe, the prosperity of Britain and Australia has been due to the superior performance of our leaders, then our job as citizens is merely to continue passively to re-elect those leaders.

But if our success is a complex combination of long-term policies and global circumstances, then our challenge is to ensure we continue constant public debate with a view to finding the right policies to sustain our position in a changing world. Letting politicians take credit for a booming economy that is not of their making distorts the public debate about economic policy.

**Andrew Charlton** is a research economist in CEP's globalisation programme. His new book *Ozonomics: Inside the Myth of Australia's Economic Superheroes* has just been published by Random House.



# in brief...

## Union blues

The membership of Britain's trade unions continues to decline and, despite a series of mergers, most of them face severe financial difficulties. **Alex Bryson** and **Paul Willman** examine their organisational failings and find a glimmer of hope in the handful of success stories – unions representing professional workers.

Trade unions are in the doldrums. Although the rate of decline in union membership has slowed since Labour came to power in 1997, the latest figures show that they continued to lose members in 2006. The reasons are clear. Unions are less able to organise new workplaces and new workers than they used to be. As a consequence, an increasing proportion of all workers have never been union members, and new workplaces rarely recognise unions for pay bargaining.

Less well known is the effect that the loss of membership is having on unions as organisations. These effects are identified for the first time in our research, which measures the resources available to unions both on their own balance sheets and within establishments.

As Figure 1 suggests, the finances of British unions are in a parlous state. This is not particularly surprising since they rely very heavily on members' subscriptions as their primary source of income. Thus, their income flows fall as membership falls unless they can increase membership fees substantially or generate income from other sources. Moreover, expenditure has exceeded subscription income for some time. Of course, this is not a sustainable strategy in the long run and it has implications for their ability to sustain assets.

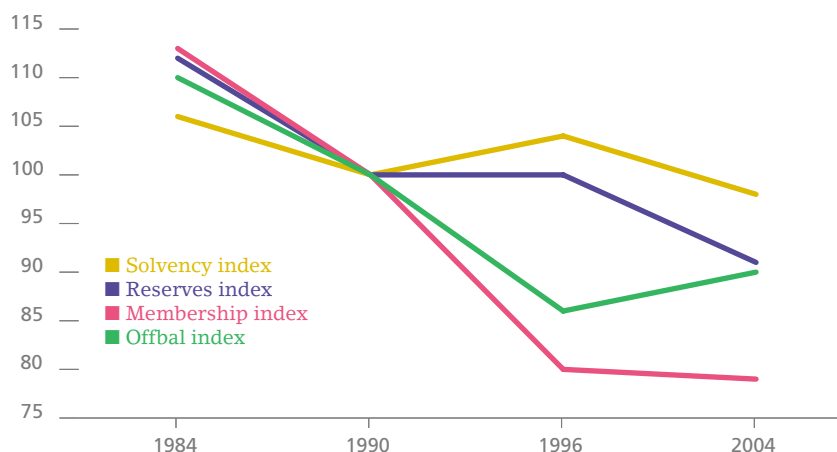
Few unions like to raise membership fees. It's generally viewed as impractical and unacceptable. Most unions allow their annual conferences to debate a higher fee but, not surprisingly, there is rarely an appetite for it so it doesn't happen. Yet unions elsewhere in the world have adopted this approach. For example, the Health Services Union of Australia recently decided to increase their subscriptions dramatically, arguing that the quality of their services, including collective bargaining, requires them to be on a stable and viable financial footing.

In countries like the United States, members are used to paying a much higher percentage of their wages in union fees: in return, they get the largest union wage premium in the world. Some unions in Britain are studying this issue carefully and are considering running experiments to test the sensitivity of demand for membership to the price of joining – whether and by how much numbers might fall if fees were higher.

Meanwhile, the chief response of unions to the diminishing pool of unionised labour has been to engage in what we call 'market share unionism', in which they have sought to grab a greater share of the remaining union pie. It is this strategy that lies behind the wave of union mergers we've witnessed in Britain in recent years.

### The most successful unions organise occupations rather than industries or workplaces

Figure 1:  
Changes in union resources 1984-2004



Each of the four indices is set at 100 in 1990. The Offbal ('off-balance sheet resources') index is constructed using the Workplace Employment Relations Surveys, from which a workplace can be rated between 0 and 3, scoring 1 each time it has one of the following: check-off; management recommendation of union membership or a closed shop; and an on-site union representative. The other three indices are derived from Certification Officer returns. Solvency is the margin of total income over total expenditure. Reserves are total funds divided by expenditure.



## Unions no longer have the organisational resources to reach out to new workers and new workplaces

Between 1990 and 2005, the number of unions fell by over 40%. In 2007, there have been further reductions and greater membership concentration following the merger between AMICUS and the Transport and General Workers Union.

The rationale for such mergers is analogous to the rationale for corporate mergers and acquisitions: unions try to consolidate their resources, creating a more substantial organisation that, at least in theory, is capable of grabbing a bigger share of existing members and, if they are lucky, attracting new members through greater 'reach'.

At the same time, the logic goes, unions can reduce their cost base by stripping out duplicate union services (offices, officials and the like). In practice, it hasn't really worked out like this. By definition, the big unions each have a greater share of union membership than they did when they operated separately. But there is no evidence that they have succeeded in expanding membership beyond their traditional base.

What's more, they have not been cutting costs so as to take advantage of the economies of scale that mergers offer. This is partly because, despite mergers, these unions rarely operate as general unions. Instead, they continue to operate along sectoral, industrial or occupational lines, often because unions recognise that different types of members require different types of service.

This organisational knowledge is often locked away in particular sections of unions used to servicing parts of the unions' membership. If unions are to reap returns to scale, they'll have to work out how to share this knowledge around the organisation and create efficient structures that permit them to service their members with fewer staff and offices.

What does all of this mean for unions in the future? First, it is doubtful whether unions will be able to service their existing members without greater reliance on the voluntary endeavours of lay union activists and their broader membership. This is what we call their 'off-balance sheet resources'. Alas, our research shows that these resources are also in decline.

Second, unions' organising capability is severely damaged. When finances are tight, unions are less likely to risk spending money organising in new workplaces unless they can be fairly sure of success. More generally, they simply do not have the organisational capacity on the ground to reach out to new workers and bring them into the union movement.

But it would be wrong to conclude that all is doom and gloom. Although the general picture looks bleak, there are huge differences in the finances of different unions and there are some real success stories.

What's more, success depends, at least in part, on the business models that unions are deploying. The most successful unions, both in membership terms and financially, are those representing professional workers, in particular, those representing doctors (the British Medical Association), nurses (the Royal College of Nurses) and teachers (the National Union of Teachers).

These unions continue to organise occupations, rather than industries or workplaces, because union membership remains strongly linked to occupational identity. As well as representing their members in pay and conditions negotiations, grievance procedures and the like, these unions also protect their members against clients and state interference. Other unions would do well to take note – before it's too late.

This article summarises 'Accounting for Collective Action: Resource Acquisition and Mobilisation in British Unions' by Alex Bryson and Paul Willman, CEP Discussion Paper No. 768 (<http://cep.lse.ac.uk/pubs/download/dp0768.pdf>) and forthcoming in *Advances in Industrial and Labor Relations*.

**Alex Bryson** is research director at the Policy Studies Institute and the Manpower Research Fellow at CEP.

**Paul Willman** is professor in employment relations and organisational behaviour at LSE.

The latest figures on union membership are in a 2006 DTI/ONS report by Heidi Grainger and Martin Crowther (<http://www.berr.gov.uk/files/file39006.pdf>).

# Life on the Monetary Policy Committee

**Stephen Nickell** was the first external member of the Bank of England's Monetary Policy Committee to serve two three-year terms. He reflects on his experiences setting the nation's official interest rate.

**O**ne Tuesday evening in the spring of 2000, I received a phone call from Gus O'Donnell, the then permanent secretary at HM Treasury, suggesting that I might like to attend a small meeting at the Treasury on the following day. After some discussion, he revealed that it concerned a job but refused to be more specific.

On the Wednesday morning, I went into the Treasury where he and Ed Balls asked if I wished to become a member of the Bank of England's Monetary Policy Committee (MPC). On the Wednesday and Thursday, I organised leave from the LSE for four days per week and had a chat with Eddie George, then the Bank's governor. Gordon Brown announced my appointment on the Friday morning.



Such speedy appointments to public bodies are relatively unusual but members of the MPC have always been, and still are, appointed with great rapidity and secrecy, much to the irritation of the House of Commons Treasury Committee.

Before starting on the MPC and having purchased a new suit, the first exciting event was to appear before the Treasury Committee for my confirmation hearing. This involved first, completing a lengthy 'exam' paper on various aspects of monetary policy-making (which was set, as it happens, by Charlie Bean, then an adviser to the committee and a fellow LSE professor, and from later that year the Bank's chief economist); and second, a grilling by the committee in the presence of the financial press.

When I made my appearance, I was the second person on, the first having been Chris Allsopp who had been appointed at the same time. Chris was given such a hostile reception by the committee (with Brian Sedgemore leading the charge) that by the time they got to me, the MPs were merely mildly aggressive, having run out of steam. This proved to be the last time that prospective MPC members went before the Treasury Committee for their confirmation hearings without a long practice session at the Bank.

The MPC operates on a monthly cycle, essentially because, by law, it must meet to set interest rates in every calendar month. The interest rate decision is made on the first or second Thursday of each month. On the previous Friday morning, the committee meets to listen to the Bank staff going through the economic news. The following week, the committee spends the Wednesday afternoon

discussing the current and future prospective state of the economy and the Thursday morning making the interest rate decision, which is announced at noon.

These discussions form the basis of the minutes that are put together by a secretariat of four Bank staff who are present throughout. These minutes are discussed at length and amended by the entire committee on the Monday, eleven days after decision day and are published, along with details of the vote, two days later.

One of the key features of this process is the fact that the decision on interest rates is taken by strict majority vote. On the Thursday morning, the governor invites each member of the committee to present their vote on rates along with their reasons, each member being expected to talk for about ten minutes. The deputy governor in charge of monetary analysis (currently Rachel Lomax) is always invited to go first, the next seven members are then asked in apparently random order and the governor always goes last.

Of the nine members, five are internals who are permanent Bank employees: the governor, two deputies, the chief economist and the head of markets. The other four are external members appointed in the same fashion as myself. On one occasion, I was present at an exceptionally unusual event. The random order of speaking by the seven members between Rachel Lomax and the governor just happened to be in anti-clockwise order around the table. If the order were truly random at each meeting, this event would only be observed, on average, once every 438 years.

Extensive study of the voting records

of the committee has failed to elucidate any patterns. There is no block voting, and within both internal and external groups there are often divisions with deputy governors voting against the governor, for example. Indeed the committee is not concerned with consensus, split votes are common and the governor has twice been on the losing side. Note that since governors always vote last, they can choose whether to join the winning or losing side except in the unusual circumstance when they have the casting vote, with the previous eight members' votes tied at 4-4.

The style of decision-making, using strict majority voting based on the individual views of nine independent MPC members, is reinforced by the fact that members are held to account for their individual votes. Formally, they are questioned in public by the Treasury Committee, where they must appear three or four times a year. Furthermore, individual members frequently use speeches, papers and interviews to justify their particular positions.

In my view, this method of decision-making – that is, nine individuals coming to their own decisions and then using majority voting to aggregate them – generates outcomes that are superior to methods based on a search for a consensus under the auspices of a dominant leader favoured by some central banks.

The desirability of having independent voices on the committee suggests that while professional economists should have a strong representation, it is a good idea to have a number of members with a different point of view. This helps to ensure that decision-making is not



dominated by a rigid consensus perspective. Indeed to guard further against this, during my time the committee often used to invite members to prepare short papers focusing on factors that might lead to decisions being seriously mistaken.

Of course, aside from the actual procedures involved with the monthly round of decision-making, there is a great deal of background activity. Within the Bank, all the external members engage in research and analysis, each assisted by two Bank researchers. This results in numerous speeches, press interviews and papers prepared for consumption by academics, financial journalists and the general public.

An important part of the job is to ensure that individual views and committee decisions are explained to the world at large as clearly as possible. To help with this, the MPC publishes a forecast every three months explaining its view of where the UK economy is going over the next three years. The production of these forecasts involves numerous meetings of the committee, interacting extensively with large numbers of the Bank staff. The monetary analysis division of the Bank contains around 120 economists, which reveals the sheer scale of the whole monetary policy operation.

On top of this, it is part of the remit of MPC members to go on regional visits. So about ten times a year, I would set off for some distant part of the UK both to listen and to explain. These visits usually lasted two days and involved a great deal of eating. The basic format was to meet large groups of business people, trade unionists, academics and so on, over, successively, lunch, dinner, breakfast, lunch.

The idea was to give a brief talk about the economic situation and then engage in discussions, sometimes heated, about how things looked from the individual perspectives of the people present. These were organised by the Bank's regional agents, who had numerous business and other contacts, and often involved the local CBI (Confederation of British Industry), Chamber of Commerce and similar organisations.

The two most popular topics under discussion concerned either the dire consequences of official regulation for business or what was going to happen when manufacturing industry disappeared

entirely. Monetary policy rarely seemed to be a cause for concern.

Between meals, I would visit local workplaces, talk to the local press and give interviews on local radio. The purpose of all this was partly to get a feel for the state of the economy on the ground and partly to fly the flag and explain what the committee was up to.

By and large, these visits were great fun. I got to visit places as far afield as the Isle of Lewis and the Isles of Scilly, as well as less exotic places like Aberdeen, Enniskillen, Pwllheli, Truro and Wakefield, plus all the major cities of the UK. I got to see the making of steel, aluminium, glass, brake linings, sandwiches, Smarties, Formula One cars and stair-lifts, went down the deepest mine in the UK (a potash mine in Cleveland), wandered around call centres, docks, farms, battery hen sheds, garden centres and shopping centres, and only failed to get to an oil rig because the health and safety procedures would have taken too long.

Overall, the hospitality was splendid, especially in Northern Ireland. The Omagh Chamber of Commerce annual dinner was particularly memorable: arriving at 7pm for pre-dinner drinks, sitting down to dinner at 9.30pm, standing up to speak on monetary policy at around midnight, and finally taking my leave of an event still in full cry well after 3am.

During my entire time on the committee, any time I appeared at a public event or conference, whatever the subject and wherever the place, journalists from the wire services were always there. Their job was to obtain a quote. These characters became a part of my life – indeed one of them followed me around, at the Bank's invitation, for an entire two-day regional visit to North Wales.

So I became famous in a rather limited, *ex officio* sense. Then on 1 June 2006, I became an ex-member of the MPC and I have never seen any of them again. It was great fun while it lasted.

UK monetary policy is decided by strict majority voting based on committee members' individual views

**Stephen Nickell** is Warden of Nuffield College, Oxford and a longstanding participant in CEP's research programme on labour markets.

The MPC decision-making method generates superior outcomes to methods based on a search for a consensus under the auspices of a dominant leader

Regulators have capped the charges that mobile operators can levy on other networks for connecting calls to their subscribers. But as new research by **Christos Genakos** and **Tommaso Valletti** shows, this leads to a 'waterbed' effect, where prices rise elsewhere. Their analysis has implications for recent EU caps on 'roaming charges'.

## Regulating the mobile phone industry: beware the 'waterbed' effect

**T**he prices that mobile operators charge other network operators (fixed or mobile) for connecting calls to their subscribers – so-called termination charges – have become a hotly debated issue among regulators and academics worldwide. The level of these charges is perceived to be high both in absolute terms, but also in relation to similar prices charged by fixed network operators.

Industry analysts argue that such charges may inhibit the future growth of telecoms services. What's more, especially for fixed-to-mobile termination rates, a large body of theoretical research in economics has demonstrated that independently of the intensity of competition for mobile customers, mobile operators have an incentive to set charges that will extract the largest possible surplus from fixed users.

This problem has provided the justification for regulatory intervention to cut termination rates. But reducing the level of charges can potentially increase the level of prices for mobile subscribers. This is what is known as the 'waterbed' effect, where pressing down prices in one part of firms' operations causes another set of prices to rise. Understanding and quantifying the effect – as our research aims to do – is critical for assessing consumer benefits from mobile termination regulation.

### Regulating termination charges

Mobile termination charges have been an important issue ever since 1997 when the first regulatory debate started in the UK. Price controls on the two largest operators were put into effect from 1998 to 2002, requiring termination

charges to be reduced by 9% per year in real terms.

After a lengthy consultation and investigation, the UK telecoms regulator (then called OfTel) concluded at the end of 2001 that mobile termination charges were still substantially in excess of cost. It proposed additional price controls for the next four years on the four major mobile companies, Vodafone, O2, Orange and T-Mobile. The companies objected and the matter was referred to the Competition Commission.

The Commission broadly endorsed OfTel's proposals. It concluded that competition in the mobile industry did not constrain fixed-to-mobile termination charges and that a price cap was the only remedy



likely to address these detriments effectively. The Commission considered that this would yield significant benefits without an increase in average retail prices or a significant loss of retail subscribers. In fact, it was during these investigations that the term waterbed was first coined by the late Paul Geroski, chairman of the Competition Commission.

Other countries have followed the UK's lead. The European Commission introduced a new regulatory framework for electronic communications in 2002. Every member state of what was then the EU-15 was obliged to conduct a market analysis of the mobile termination market and, to the extent that market failures were found, remedies would have to be introduced. Indeed, all the countries that completed the analysis did find problems and imposed (differential) cuts to termination rates.

In 2005, the New Zealand Commerce Commission introduced similar regulation and while it was convinced that the waterbed effect is a theoretically general phenomenon, it doubted its empirical importance. Similarly, the most recent termination rate proposals by Ofcom (OfTel's successor organisation) acknowledge the importance of the waterbed effect, but question whether the effect is 'complete', arguing that this can only be the case if the retail market is sufficiently competitive.

### Analysing the waterbed effect

Mobile operators compete in the marketplace to win subscribers, who then provide a stream of revenues. They compete by offering attractive prices for subscriptions and outbound mobile calls and also, in the case of monthly subscribers, subsidised handsets. In doing so, they consider all the revenues that will accrue from acquiring a customer and all the costs of servicing

that customer. Part of their revenues are the charges that they receive from other networks for connecting calls to their subscribers.

When considering its pricing policy, a mobile operator will take these termination revenues into account. The higher these revenues, the lower the total price an operator would charge its customers. It makes sense for any mobile operator to pass-through some of its revenue to consumers, because by lowering prices, it increases the number of mobile subscribers, which in turn increases the termination revenues earned.

Of course, the reverse is also true: if regulation reduces termination charges and hence revenues, operators will have to raise their prices to subscribers. To assess how widespread this waterbed effect might be, we need to analyse how it can emerge under different market scenarios.

If the mobile market were characterised by very strong (perfect) competition, then operators would expect to make zero excess economic profits. Consider now what would happen as a result of an increase in termination charges. This would increase the revenues associated with each new customer, hence increasing their value to mobile operators. Mobile operators would start competing by lowering their prices to acquire these new customers.

The result of competition would be a complete waterbed effect: any additional profit would be simply passed on to consumers via lower prices, so that economic profits remain zero. Under this market structure, the introduction of regulation to cut fixed-to-mobile termination charges would affect the structure of prices but not the overall profitability of operators.

While competition appears to be strong in the mobile industry, both regulators and market analysts agree that operators possess a significant amount of market power. Hence, there is also a need

to consider the nature of the waterbed effect when competition is not perfect.

Consider the extreme case of a monopolist. Economic theory suggests that a firm with full market power maximises profits by setting the price at the point where marginal revenue equals marginal cost. In other words, the price is such that the extra revenue the monopolist earns from selling his last unit is equal to his extra cost of producing this unit.

Consider again the effect of an increase in termination charges. Assuming for simplicity that each subscriber generates the same amount of termination revenue, this would increase the revenue earned on each consumer. As a result, the monopolist would now charge a lower price to attract more customers, again causing the waterbed effect.

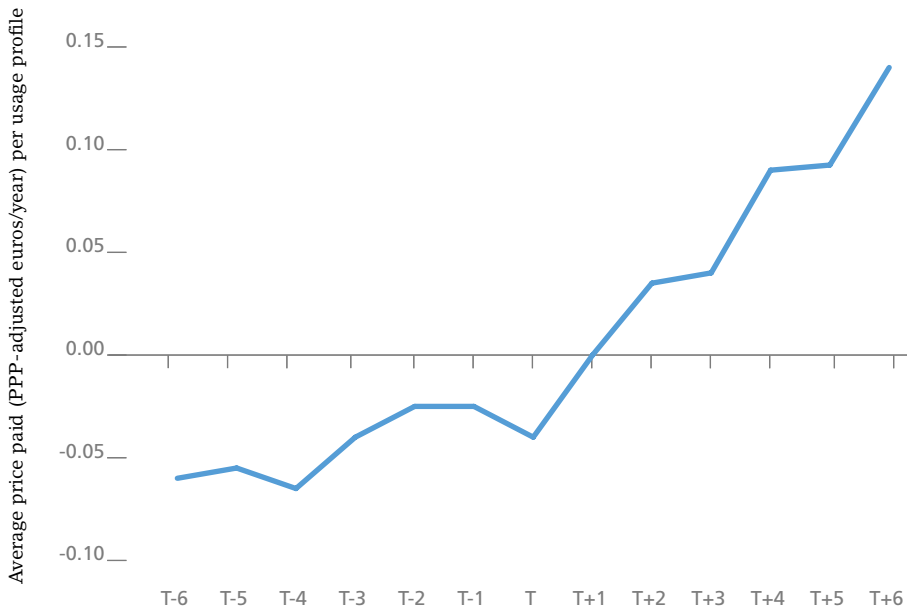
Notice that the waterbed effect would not be complete now, as the firm would pass-through as lower prices only part of the extra revenue. Hence, even in the extreme scenario of a firm possessing complete market power, a reduction in termination charges is expected to cause lower marginal revenues that would increase optimal subscription prices.

In practice, mobile markets worldwide are dominated by a small number of firms. Competition among them is expected to be somewhere between the two extreme scenarios of perfect competition and monopoly. Under these more general (oligopolistic) market conditions, the same economic logic applies.

The size of the waterbed effect is key to understanding the costs and benefits of termination charges regulation



Figure 1:  
Average mobile phone usage price around the introduction of regulation of fixed-to-mobile termination charges



Quarters around the introduction of regulation (T), so T-1 means one quarter before the introduction of regulation

Price caps on termination charges have led to significant price increases for mobile phone subscribers

The magnitude of the waterbed effect will depend on the intensity of competition as well as the shapes of the demand and cost functions underlying the mobile industry. The previous two extreme market structures provide us with the bounds within which we expect the waterbed effect to lie.

### Measuring the waterbed effect in the mobile phone industry

Despite the importance of the waterbed effect and the wide range of market conditions under which it arises, until now, there has been no systematic evidence to back up the theory. The main purpose of our research is to examine the existence and magnitude of the waterbed effect in the mobile phone industry. Using a new dataset of mobile operators across more than 20 countries during the last decade, we analyse the impact of fixed-to-mobile termination rate regulation on prices and profit margins.

Both the timing of the introduction of regulated termination rates and the severity with which they were imposed across mobile operators in practice varied widely, driven by legal and institutional characteristics of each country. This variability allows us to identify and quantify the waterbed effect for the first time by looking at the impact of regulation on prices (and profits) in reforming countries compared with the general evolution of prices (and profits) in non-reforming countries.

Figure 1 plots the average retail price for mobile phone usage in countries that have experienced a change in regulation, six quarters before and after the introduction of regulation. Notice first that compared with prices in the rest of the world, average prices in countries that experienced a change in regulation were actually lower before the introduction of regulation. This is important

because it refutes the argument that regulation was introduced as a result of high retail prices for making mobile calls.

Most importantly, in line with our waterbed prediction, the introduction of regulation has a clear positive impact on prices that becomes stronger as regulation becomes progressively more binding.

The full empirical analysis allows us to control both for common global trends and for any country and operator characteristics that remain constant over time and may influence both regulation and prices. Our estimates suggest that although regulation reduced termination rates by about 10%, this also led to a more than 10% increase in mobile outgoing prices on average.

But although the waterbed effect is



large, our analysis also provides evidence that it is not complete: accounting measures of profits are positively related to termination rates, thus mobile firms suffer from cuts in those rates as they possess some degree of market power.

## Conclusions

The existence and magnitude of the waterbed effect following the regulation of termination rates is key to understanding the social costs and benefits of the regulation. Regulators have generally accepted that the waterbed effect is likely under perfect competition, but they had doubts about its validity and empirical significance under conditions of imperfect competition. Our research shows that the waterbed effect exists under a wider range of possible conditions and is both significant and strong in practice.

These results have important implications for the mobile industry, but also for other 'two-sided' markets – industries like shopping malls, credit cards and dating agencies, where firms need to attract two (or more) groups of customers if they are to succeed.

- First, it implies that any analysis of the costs and benefits of regulation of termination rates cannot ignore the presence of the waterbed effect. The impact of regulation on (unregulated) prices for mobile subscribers should be taken into account when assessing the overall costs and benefits of regulation.
- Second, the mobile phone industry exhibits features typical of two-sided markets. The market for subscription and outgoing services is closely interlinked to the market for termination of incoming calls. As in any other two-sided market the structure of prices (who pays for what) is fundamentally important for the development of the

market. Therefore, any regulatory analysis must take these linkages into account either at the stage of market definition or market analysis.

- Finally, our analysis has implications for the current debate about regulation of international 'roaming charges' – the prices customers pay when using their phones outside their home country.

The European Commission has voted to cap roaming charges for making and receiving phone calls within the EU. These charges account for 5-10% of operators' revenues globally and a larger proportion of their profits. The aim is to reduce the cost of making mobile phone calls while abroad and hence encourage more overseas (but within EU) phone use.

A reduction in roaming charges may cause a similar waterbed phenomenon, whereby prices of domestic calls may increase as operators seek to compensate for their lost revenue elsewhere. Whereas with fixed-to-mobile termination regulation, it was fixed users that essentially subsidised mobile users, in this case, it would be the mobile subscribers themselves that would bear the burden, as calling abroad would be cheaper but calling at home could become more expensive.

While the likely magnitude of the waterbed effect caused by this new legislation is debatable, our results demonstrate that regulators have to acknowledge its existence and carefully account for it in their calculations of consumer benefits.

## Regulation to cap roaming charges within the EU may make domestic calls more expensive

This article summarises 'Testing the "Waterbed" Effect in Mobile Telephony' by Christos Genakos and Tommaso Valletti, CEP Discussion Paper No. 827 (<http://cep.lse.ac.uk/pubs/download/dp0827.pdf>).

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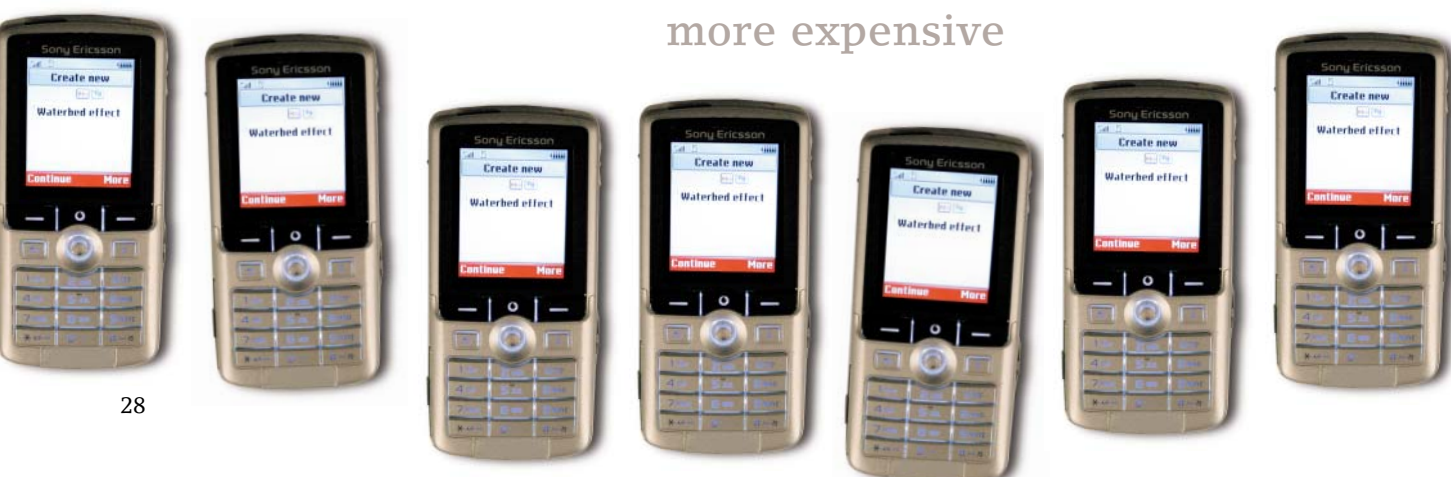
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