



HM TREASURY

# **Microeconomics Lecture Series**

May 2004-June 2005

## **Preface**

Between May 2004 and June 2005 we were privileged to welcome to the Treasury, and to a Government Economic Service (GES) audience, eleven academics of international distinction. As Head of the GES, I had asked them to share with us their thoughts on how modern microeconomic theory and empirical analysis could contribute to critical issues facing policy-makers. This booklet presents an opportunity for their thoughts to reach a wider audience.

Successful microeconomic policy requires not only clarity on economic principles and a respect for the evidence, it also requires we understand the complexities of how the world works and that we think about how to adapt to long-term changes in society. A stable and sustainable economy is a crucial foundation for good microeconomic policy and the macroeconomic success of the UK over the last several years has provided the platform for continued action and still stronger focus on the micro front.

Charting a path through the complexity and change of the 'real world' requires principles based on sound theory and expressed in ways which can be put to practical use. This collection of lectures provides a rich set of insights from theory for micro policy by some of world's most distinguished analysts and theorists.

The first lecture 'Economic principles, public policy and the role of the state' by myself offers a survey of microeconomic theories of policy that I hope will provide a unifying context for the thoughts of the guest lecturers. The further ten lectures are presented here in four groups, in alphabetical order within each group:

- Market Structure and Industrial Organisation - Klemperer, Newbery, Tirole
- Saving and Pensions - Blundell, Diamond
- Inequality and Social Exclusion - Atkinson, Hills, Nickell
- Applications of Microeconomics to Public Policy - Kay, Layard

Full titles and affiliations of the authors are provided in the 'Biographical Notes' section.

I am very grateful to our guest speakers for their kind agreement for a summary of their talks to be published here. The summaries presented here were prepared from notes taken by Treasury staff. The views expressed in this lecture series do not reflect UK Government policy.

Sir Nicholas Stern  
HEAD OF GOVERNMENT ECONOMIC SERVICE

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# **Microeconomic Overview of Public Policy**

# **Economic Principles, Public Policy and the Role of the State**

Nick Stern

## **Summary**

Nick Stern focused on economic principles, public policy and the role of the state. The intention was both to give a flavour of what was to come in future lectures and to celebrate a long tradition of welfare economics and the theory of public policy, and the contribution of several outstanding economists to this tradition.

He argued that although macroeconomics has been central to public policy, our Government's success in recent years in delivering macroeconomic stability and growth means that it is now on the micro side that many of the most challenging questions of public policy lie.

## **Economics of Welfare: markets, efficiency, public-sector pricing and externalities. From Dupuit to Meade.**

By the beginning of the 20<sup>th</sup> Century we had most basic elements of the 'first best' theory of welfare economics in place.

The story started with Jules Dupuit, the French engineer economist, who first introduced the idea of marginal-cost pricing. In the context of getting the most out of a bridge, he suggested that price should equal marginal cost and therefore that the right price for crossing the bridge was zero. The idea was that if price were above zero (marginal cost in this case) then crossings which had positive value to the user would be deterred when the extra cost of one more crossing was in fact zero. This work gave birth to the idea of marginal-cost pricing, which has proved to be a powerful fix on one aspect of the problem of optimal pricing. This approach, however leaves open the problem of how the construction of the bridge is to be funded.

It was Knut Wicksell who suggested that the best way of funding expenditure (e.g. building the bridge) was through lump-sum transfers. These would be taxes that people could not affect by changing their behaviour and so would avoid distortion of choices.

Vilfredo Pareto put this whole approach into a general equilibrium context. He took the basics of marginal-cost pricing and financing which were already established in a partial equilibrium model and showed that the basic results were correct in a general equilibrium model where there were possibilities of substitution between goods.

The analysis of externalities was first introduced by Alfred Marshall. These occur where an act of consumption or production directly impinges on others so that the social cost is above the private cost (supposing in this case the act does direct harm on others rather than conferring a benefit). The theory was

further developed by A. C. Pigou who in the 1920s proposed the principle of taxing for externalities so that consumers or producers faced the full marginal social cost.

Thus around 80 years ago we had the basics of the first-best theory – marginal cost pricing, financing through lump-sum transfers and taxing for externalities – in place.

### **The second best, income distribution and market failures which are less easily fixed.**

#### ***i) Limits on Taxation. From Ramsey to Mirrlees.***

During the 20<sup>th</sup> Century, economists started worrying about the assumptions of the first best, and examined the implications of departing from these assumptions. For example, departures from marginal-cost pricing may be needed where such pricing does not raise the full amount needed to finance public expenditure; and where there is increasing returns to scale and marginal cost is less than average cost so that marginal-cost pricing inevitably results in a loss for such enterprises.

It was Frank Ramsey who first set out the theory of how the state should set prices or levy taxes where revenue could not be raised in a lump-sum way. This was his theory of optimal indirect taxation. He also made seminal contributions to the theory of optimal growth and optimal saving; and to subjective probabilities and utility theory.

These were extraordinary achievements for a young man: Ramsey died when he was 26. His theory of optimal taxation in 1927 constituted the beginnings of the theory of the 'second best'. It was not until after the Second World War that Ramsey's ideas on taxation of goods were taken further by Samuelson, Boiteux and Diamond and Mirrlees among others. But we had to wait until 1972 for the breakthrough, by James Mirrlees, on optimal income taxations, for which he won the Nobel Prize. His central insight was that problems of information were at the heart of the problem of how to tax income: the state could observe only income and not the skill differences which were generating differences in income. This was, essentially, the problem of optimal policy when taxes affect both the size and the distribution of the cake through their influence on both effort and reward. Although this last statement of the issue was in common language, Mirrlees was in effect the first person to write it down formally. It was a very difficult problem – both conceptually and technically - even in its most basic form.

Mirrlees used a very simple model of difference, whereby people vary only in their wage rate, which Mirrlees interpreted as a difference in skills. Differences are essential to the interest in the problem since, where people do not differ - everyone is the same - you would levy a poll or lump-sum tax the same for everyone.

The first-best theory in the case where people differ, but where skill differences are observed and lump-sum taxes are possible, would suggest that you should levy a heavy lump-sum tax on the high skill/earning individuals (relative to the less skilled) so that the income effect on labour supply caused them to work hard. However if you were to hit the very skilled with high taxes they would have an incentive to suppress the information that they were very skilled. This is where the second-best theory comes in, and explains why this is essentially a problem of information in this formulation: you cannot directly observe how skilled someone is, only their income/labour supply.

Since the specification of an income tax generally involves describing the whole income tax schedule, Mirrlees' task was essentially to choose a function that related pre-tax income (on the horizontal axis) to post-tax income (on the vertical axis) across the entire range of incomes. This is technically a very difficult problem since choosing a function rather than just a few tax levels is a problem of optimising in infinite-dimensional space. Thus he showed both that optimal income taxation was essentially a problem of the economics of imperfect information and he provided, at least in a simple framework, a method for deriving a solution.

### ***ii) Further information asymmetries. From Arrow onwards.***

Work by Kenneth Arrow, George Akerlof, Michael Spence and Joseph Stiglitz further developed this theme of imperfect information. For example, Arrow's 1963 paper eloquently demonstrated the problems of asymmetric information in shaping institutional, government and market structures for medical care.

If a consumer wants to buy shoes, he or she knows in large measure what kind and size of shoes they want and knows how to choose between different options. However, if a patient goes to a doctor, he or she (because of limited medical expertise) does not know what kind of treatment they want or need (even if they have an idea about what is wrong with them). This was why the state regulates by insisting on a certain quality of healthcare. Some have argued that we should regulate doctors simply by providing information, for example, by publishing the death rates of their patients. If we feel that there is something instinctively wrong with this, we should think it through and clearly articulate why.

In general, making more, rather than less, information available to the public is a good thing. However, information alone is not always a sufficient system of regulation. New Zealand recently considered a system of banking regulation which rested largely on asking banks to publish (audited) rates of interest together with basic statistics relevant to risk. Much financial information is very difficult to assess and can be manipulated and the general public naturally look to the Government to take some responsibility and apply the appropriate expertise to regulating financial institutions. Although this is attractive in its simplicity, it has some problems too. Similarly, we might be uncomfortable with published death rates being the main way in which doctors are regulated.

This perspective takes us to a further important component of second-best theory, the theory of regulation. At the root of this theory is the insight that the Government is likely to want to intervene, for example by regulation, when individuals or firms know something – usually about technology, or uncertainty and risk - which the Government or others do not know and where they can use that information to market advantage. This is asymmetric information again. Notable theorists of the theory of regulation include Jean-Jacques Laffont (who sadly died very recently) and Jean Tirole.

### **The common theoretical basis of the theories of taxation and expenditure. From Meade onwards.**

Through the work of the theorists outlined and the development of the first- and second-best theories of welfare economics, we have built up a powerful body of analysis, encompassing both theories of tax *and* expenditure. In asking ‘how should we assess the use of public revenue in a project or programme?’ and in asking ‘how should we raise that revenue?’ the basic theory is exactly the same. The former question is asking how we can best move resources; and the latter how we can best set prices. And we know, the most basic insight in economics, that quantities and prices are linked via demand and supply curves.

The choice of prices and taxes is essentially an optimisation problem: one of how to do as well as possible in the face of constraints such as the availability of resources and the information at our disposal. The problem of scarcity and resource allocation can be conceptualised as a shadow price on a constraint: essentially, how much better you could do with one bit more. These shadow prices in this sense are essentially the prices that are recommended in the Green Book (2005). Shadow prices embody the idea of opportunity cost - what you give up if you lose a unit of resource. This in turn drives the entire theory and practice of project appraisal. James Meade, in his book “*Trade and Welfare*”, sets out this insight in a clear way in a brief technical appendix published shortly after the Second World War. This is the Meadean approach that underlies both the theory of indirect taxation and the modern theory of cost-benefit analysis set out in the article by Jean Dreze and myself (1990)

In summary, we now have an integrated theory of public policy, which covers both revenue and expenditure. I will call this theory of prices and taxes, and of resource allocation, the ‘Meadean’ theory, after James Meade.

### **What does all this imply for the role of the state?**

The discussion above has been merely about theoretical approaches to deciding taxes, revenues and expenditure. But we can use these ideas to derive key insights into how to understand the role of institutions, of organisations, and of the role of the state. Thus we can use these ideas to examine the questions of what the state should do and how it should try to do it? From this perspective, the theory tells us a great deal. But like all theories

which simplify in order to make ideas precise, it also misses a great deal that is important.

The theory set out above guides us on the role of state in:

- encouraging competitive markets;
- correcting for externalities;
- providing public goods; and
- taxation that deals with both incentives and distribution in the context of inequality and differences between people.

Broadly it focuses on creating markets, raising revenue for public action and correcting for various forms of market failure.

There may be some areas of government intervention which do not immediately appear to be justified by the first- or second-best theories. However, even in complex areas such as the rationale for government to intervene in the economy to increase productivity, simple ideas such as market failure, public goods, and externalities get us a long way. For example, the success of the first restaurant owners in a former communist Eastern European state to provide good service, had positive externalities because it demonstrated the returns to this approach and encouraged others to do the same. Thus productivity is raised in the service sector. That is why public resources were devoted to the European Bank for Reconstruction and Development, where I was Chief Economist in the 1990s, to find its role in fostering transition from a command to a market economy. Similarly, one part of the Government's role in raising productivity could be seen as acting to promote positive externalities and spill-over benefits.

However, the theoretical approach described also leaves out some important issues. The first of these is government failure – instances when government action fails because, for example, the incentives facing public administrators are misplaced, or because the state has been improperly diverted by interest groups. The raising of the problem of government failure is not new: it was clearly recognised by the Italians in the 14th century – and was reflected in, for example, frescos by Ambrogio Lorenzetti in Sienna depicting the contrasting actions and performance of good and bad government.

It was also very clear to Machiavelli five centuries ago. In Chapter 6 of *The Prince* he described the often overwhelming problems of the reformer. Those who benefited from a proposed reform would give only lukewarm support, whereas people who do not benefit would pursue the reformer with the “zeal of a partisan”. Being a reformer was therefore very dangerous: one needed, as he suggested, to be an “armed prophet”.

A second issue that is missed in the Meadean body of analysis was the philosophical theory of rights. Economists often struggle with this set of ideas or dismiss the notion of rights as not part of economics. That is a mistake – this set of issues should be examined directly within the economic theory of policy. Why, for example, should we have compulsory education of children up to age

16? There is nothing in the simple economic theory described hitherto suggest that this is self-evident. Our support for this idea comes at root from the idea of equality and inclusion and from endogenous preferences (children's ideas of what is preferable or good for them change over time and with experience and education). But these are ideas for which a training in economics equips analysts to make a strong contribution. Similar issues arise in thinking about unemployment. The uneducated and unemployed lose more than simply education or employment: they also suffer in terms of damage to their ability to participate in the economy and society.

### **Beyond Meade to “Growth and Empowerment”**

Stern, Dethier and Rogers (2005) raise some questions which arise in trying to understand the problems of developing countries. In so doing they go beyond the standard Meadean approach: they examine the foundations for both growth and the participation of poor people in growth. These include

- the role of governance;
- the role of institutions; and
- the role of changing behaviour and preferences.

Experience in developing and developed countries alike has told us that governance and institutions have an enormous effect on the way people go about their daily activities. For the purpose of this discussion we may follow standard dictionaries and define governance as ‘the manner of governing’ and institutions as ‘organisations and rules’.

The role of preferences and behaviour is a thorny issue for economists. Some have asserted that economists must assume that preferences are fixed because to do otherwise would be to trespass in the realm of psychology. However, much of public policy has been about how to change behaviour in deeper ways than just through incentives. The state often acts as a persuader in getting people to take exercise, to recycle their waste, to stop smoking and so on. To dismiss attempts to change preferences as outside economics and focus only on other, mainly market instruments, is to miss much of the core of policy problems.

Other examples of areas where the state may be interested in changing preferences include pensions and charitable giving. By changing default options, e.g. from opting in to opting out and vice versa we can change perceptions of what is sensible, or desirable, and thus behaviour. These are decisions governments have to make and economists should play their part in analysing them. Similarly, UK Universities are trying to change the way people view giving money to their former place of study. They would need to go beyond incentives – to influence attitudes and values - to do this.

Influencing people's preferences raises some difficult ethical issues. Who are we, we may, indeed should, ask to decide on what people should be

encouraged to prefer? In considering this question we can direct our attention to thinking about legitimate and valid processes for engaging with the public and promoting debate about their preferences. This then becomes a matter of building perspectives and decisions through democratic processes rather than imposing one view of what is 'right'. We might draw on John Stuart Mill's account of representative democracy as, in large measure, a process of interaction through which views are changed, rather than a simple exercise of stating preferences and counting votes. Amartya Sen's work (1999) based on the concept of freedom – and expanding the opportunities facing people – is a further and complementary conceptual approach to some of the problems of forming policy without assuming fixed preferences.

These are pressing challenges in public policy, which need more explicit and relevant theorising and analysis. Economists should not duck them.

### **Conclusions**

The 'Meadean' approach is powerful, has served us well and we can, and should, make much better use of it (for example in applying congestion charging more strongly, or in the allocation of public funds to different government programmes). Policy would be made more successfully around the world if policy-makers had a better understanding of what it involves.

It is important, however, to go beyond the limits of the Meadean theory. We require, for example, a stronger understanding of the economics of institutions and of how governments as well as markets can fail. And in particular we must focus still more strongly on the role of governance, institutions and changing behaviour in shaping policy towards both the dynamics of growth in a changing world and the challenge of inclusion.

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# **Market Structure and Industrial Organisation**

# Competition: its power, its fragility, and where we need more of it

Paul Klemperer

## Summary

Paul Klemperer drew on the experience of auctions for 3G telecom licences across Europe - and more specifically, his own experience of designing the 2000 UK auction - to illustrate the case for competition and to demonstrate its vulnerability. Governments play an essential role in promoting and protecting competition.

- Ensuring competition had a first-order effect in increasing the prices for 3G spectrum at the 2000 UK auction. Other aspects of auction design were of lesser importance.
- Likewise in ordinary (non-auction) markets, competition has a first-order effect on consumer welfare, and better regulation is often of relatively lesser importance.
- Competition is fragile and should be protected by strong competition policy.
- The largest problems in competition arise where the Government plays a key role - for example intellectual property. If the Government wishes to find areas in which to improve competition it should look to the fringes of the state.
- Reform to intellectual property rights (IPR) and spectrum trading provides two areas where potential gains could be high.

## Auction theory

Auctions are the simplest form of market: behaviour at auctions is sharp and clear, and there are distinct rules about what firms can say and do. In contrast, wider markets have multiple agents and more possible actions, often with no clear rules. So economists have studied auctions for the same reason biologists have studied fruit flies - their simplicity allows for an understanding of more complex markets.

Jeremy Bulow and Paul Klemperer established what has become known as the 'Bulow-Klemperer theorem':<sup>1</sup>

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<sup>1</sup> See for example Paul Milgrom (1996) "Putting Auction Theory to Work" p148. See also Jeremy Bulow and Paul Klemperer "Auctions versus Negotiations" American Economic Review, pp180-194.

For any given number of bidders, the difference between the most sophisticated and least sophisticated auction designs is worth less to the seller than a single extra (non-colluding) bidder.

An implication of the theorem is that maximising competition is of the first-order in creating the conditions for a successful auction. Other aspects of design are of second-order.

In the auctions held across Europe for 3G spectrum licences the average revenue raised was 1.5% of GDP. However, despite the fact that countries were selling identical products, the revenue raised across countries varied hugely. This is illustrated in the table below.

**TABLE 1:** Revenue raised per capita from auctions of year-2000 3G spectrum licences

|             | (€ per capita) |
|-------------|----------------|
| UK          | 650            |
| Netherlands | 170            |
| Germany     | 615            |
| Italy       | 240            |
| Austria     | 100            |
| Switzerland | 20             |

Why did the outcomes differ so much? There are at least three things that might explain the differences:

- a) **Value differences:** Stock-markets fluctuated during the period, and the market in each country was valued differently. But this did **not** fully explain the outcomes. The estimated value was between €300 and €700 per capita in all the markets. Value and outcome are not always correlated: Switzerland had conditions that would be expected to maximise value (e.g. high GDP per capita, central location within European telecoms networks) but made less money from its auction than any other.
- b) **Clever auction theory:** This suggests that the design of the auction is a driver of success. This explains some of the difference, but is not as important as the third explanation (except to the extent that clever auction theory contributed to the third explanation).
- c) **Competition differences:** This is the key factor – a successful auction requires a high number of bidders and no collusion between them. The designers of the auction paid close attention to maximising the number of bidders entering the contest. They also deliberately ran their 3G spectrum auction ahead of other European countries. They knew that the uncertainty in the first auction would increase competition, and competition would also be reduced in later auctions because the losers in the earlier auctions would give up (see below) and because the competitors would learn to play the game better to undermine

competition. So competitors would make higher bids in the first auction. By contrast, by the time of the Swiss auction, there were just four bidders for the four licences for sale. There was no reason for the bidders to compete and their bids were low.

Table 2 below illustrates that over time there was a reduction in the number of bidders engaging in the auction.

**TABLE 2:** Number of competitors bidding in 3G auctions in date order

|             |  |
|-------------|--|
| UK          | 13   |
| Netherlands | 6 (anomaly might be caused by poor auction design) |
| Germany     | 7  |
| Italy       | 6  |
| Austria     | 6  |
| Switzerland | 4  |
| Belgium     | 3  |
| Greece      | 3  |
| Denmark     | 5 (good auction design)                            |

So the most important factor in auction design is to attract and maintain competition. In designing the UK auction, the aim had been to make the auction attractive to entry so as to increase the number of competitors.

### **Fragility of competition**

The Bulow-Klemperer theorem generalises to demonstrate the power of competition in 'ordinary' (non-auction) economic markets.

Competition is fragile because established firms are opposed to competition and gain by undermining it. Competition benefits countries but not firms. In the 3G auction, one firm had spent more on lobbying against the design of the UK auction than the Government had spent designing it. In areas where there is limited competition, the presence of strong incumbent firms deters new firms from entering markets.

More competition does not merely lower consumer prices (and, equivalently, raise revenues in auctions). It is important not to underestimate the other benefits it could bring. For example, there is a link between competition and innovation. This is a hotly debated area, but there is a reasonable consensus that greater competition in most circumstances relevant to policy (and certainly to competition policy) leads to more innovation. (In particular a movement from a monopoly to a tight oligopoly, or a tight oligopoly to a less tight oligopoly, leads to more innovation.) Competition can also improve incentives for effort and improve the organisation of the firm, and it ensures that only the best firms survive.

It could be argued that auctions overestimate the fragility of competition. Auctions are 'winner takes all' markets in which bidders either win or lose, but

in many markets firms experience varying degrees of success or failure. However, high-tech markets are particularly similar to auction markets (and the analogies are relevant to the anti-trust cases against Microsoft).

It is important that the Government and academics visibly support competition and design strong competition policy in the face of entrenched opposition. The UK has introduced strong competition law (the Competition Act 1998 and the Enterprise Act 2002), and the UK competition framework is widely recognised as being first class. However, it is arguable that the changes introduced by recent legislation could result in some harmful side effects:

- a) **Independent competition authorities:** The competition authorities (The Office of Fair Trading (OFT) and Competition Commission (CC)) are now independent of Ministers and their decisions are final. This freedom from political pressure is necessarily countered by greater legal scrutiny, and by challenge over decisions from the newly formed Competition Appeals Tribunal (CAT). It is possible that despite their new responsibilities and independence, the increased legal proofing of procedures in response to the greater scrutiny might actually weaken the authorities' ability to enforce competition effectively. In effect this could result in the authorities concentrating too closely on the legalities and not on the economic substance.
- b) **Members of the CC:** The CC currently employs around 50 part-time members who formed panels of around five members to hear inquiries. The increased responsibility of the CC and the need for consistency and professionalism in decision-making might result in members needing to become full-time in the future – though this is not recommended at the present time.
- c) **OFT powers against cartels:** The Enterprise Act has made cartels a criminal offence - those participating in hard-core cartels can be imprisoned. Cartel cases are now heard in criminal courts, which require a higher burden of proof than civil courts. This might inhibit the OFT's ability to prosecute offenders successfully.
- d) **CAT's interpretation of appeal powers:** The CAT has so far demanded a high burden of proof at appeal, even for small penalties levied by the OFT.

Beyond these caveats, and some worries about services (including financial) and professions, there are few concerns about the framework of competition policy within the UK.

Staff from OFT noted that competition law and the remit of the authorities prevented anti-competitive behaviour rather than promoting pro-competitive actions, although preventing bad behaviour in itself did promote good.

## **Where do we need competition?**

The key problems with competition policy are in those markets where competition has not been introduced - i.e. where governments block or restrict competition. There are several markets or sectors where greater competition might be introduced.

### ***Intellectual property rights (IPR)***

It is well established that patents and copyrights reward and encourage innovation, but patents can also discourage follow-on innovation and can be used to block competition. The number of patents applied for by firms has increased over time.

The justification for patents is that firms need to capture monopoly rights to offset the high fixed costs of research and development. This justification does not hold for all new innovation however, and patent rules should acknowledge differences between types of innovation so as not to block competition.

Patents are not always of a high quality or strongly justified. Bad patents are not often challenged – perhaps because patent agencies do not scrutinise patent applications on an appropriate basis or because the legal rules surrounding patents are too complex. A further problem is the high cost of legally challenging a patent, which might discourage smaller enterprises from challenging. And, importantly, there is a free-rider problem because the benefits from a successful challenge go to consumers and to other firms, as well as to the challenger. One way to counter the increase in unjustified patents would be for the Government to simplify the rules for challenging patents and copyright<sup>2</sup>. The UK patent bill will make it easier, but more could be done.<sup>3</sup>

Another more extreme option would be for the Government to limit IPR to certain markets or types of innovations. For example, patents should not necessarily be awarded to business processes. There are some markets (pharmaceuticals, possibly bio-technology and speciality chemicals) where innovation needs to be protected because development costs are high. First movers in other markets could find rewards for their innovation without IPR.

The Government should certainly not extend IPR. The current draft EU directive on patenting computer-implemented inventions (i.e. software) arouses concerns. The USA is also currently extending patent and copyright protection. The Sonny Bono Copyright Extension Act has recently allowed Disney to extend its copyright from fifty to seventy years after the death of Walt Disney.

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<sup>2</sup> It is possible that the OFT or other government body should take a role in challenging unjustified IPR.

<sup>3</sup> Paul Klemperer's *Financial Times* op-ed on intellectual property rights, published shortly before this lecture, is at [www.paulklemperer.org/PressArticles/FinancialTimes-PatentProtection.pdf](http://www.paulklemperer.org/PressArticles/FinancialTimes-PatentProtection.pdf)

Although only legal remedies to the problems caused by intellectual property rights had been put forward in the lecture, there were also potential economic remedies. For example, there might be a system of awards, although it was unclear who would fund it – possibly a foundation. There might be awards for firms developing medicines for Africa for example. Another suggestion was hosting an auction for compulsory licensing rights.

### ***Where the Government prevents or distorts competition***

There are several areas in which the Government could do more to promote competition. For, example:

- Airport slot trading
- Spectrum trading
- Land use and agriculture
- Trade policy
- State aid
- Government procurement
- Local planning process

To take one of these examples, radio spectrum is currently used inefficiently in the UK. Those who occupy the spectrum have little incentive to use it efficiently or extract most value from it. The Ministry of Defence (MOD) owns a considerable proportion of the spectrum for telecoms in the UK. The MOD's spectrum should be properly accounted for and appropriately priced to ascertain whether any excess spectrum could be opened up to competition. If spectrum use were liberalised and trading permitted, the market prices would *not* be high because the incentives to use spectrum more efficiently would free up a lot of spectrum. But deregulating spectrum use might not be welcomed by some firms which would face more competition (as experience in other countries demonstrated), and there are dangers in partial reforms.

Introducing small charges could often increase competition and reduce nuisances. The introduction of the Congestion Charge in London had levelled the playing field for modes of transport in London (people were now charged for driving into London in the same way they were charged for using public transport) and had consequently encouraged competition. Putting a charge on sending email could reduce the level of spam significantly. It would be even more efficient to reduce the amount of junk mail (and junk phone calls) by having individuals specify prices which firms would have to pay to contact them.

In some markets, more innovative instruments could be used to introduce and support the introduction of competition, with important applications in regulated industries. For example, in opening up the gas market, the Gas Regulator imposed a time lag on British Gas's ability to respond to lower prices by new entrants thereby giving the new entrant a time period in which to establish itself.

It was sometimes possible for the Government to encourage entry into a market through state aid (in the case of Airbus for example) although the merits of doing so must be considered carefully in each case. There was sometimes a finely balanced case, but the presumption should be against State Aid.

However it is not always in the public interest to introduce competition. Particular care should be taken in delivery of public services. Issues that need to be considered include equity, consumer contracts, and consumer information. In healthcare, for example, competition might have a negative effect in some circumstances: private hospitals might not retain a public ethos; a natural monopoly might be created which would have to be regulated; complicated contracts could be required and would bring with them information and incentive problems; targets could be multiplied and might detract from the delivery of core objectives (e.g. quality, preventative medicine, and the development of medicine); and the allocation of resources might be unfair.

# Infrastructure Pricing and Finance

David Newbery

## Summary

Different industrial structures, patterns of ownership, and modes of pricing have had various effects on the level of investment in the crucial infrastructures of electricity, water and the railways. David Newbery argues the case for far more investment in road infrastructure, drawing on a series of case studies to demonstrate the problems of public infrastructure provision, and the remedies demonstrated by the British approach to regulating privatised network utilities. These suggest a radically new approach to financing road investment.

- In the UK, profitable privatised networks such as electricity and water, work well under well-designed incentive regulation; unprofitable privatised networks, such as Railtrack, are more problematic.
- The public network of the UK's roads, which suffers from lamentable under-investment, is much worse than these networks.
- Public ownership does not automatically mean low investment. The fact that, in the case of utilities, privatisation ushered in much needed investment was in part due to price rises that were not politically feasible while the networks were within the public sector.
- In the UK there is underinvestment in roads and too much investment in rail. Roads are overpriced. At the margin investment in roads is more attractive than investment in rail.
- The UK's road and rail investment suffers from flaws in public cost-benefit analysis. Externalities are often exaggerated, the value of life needs to be reassessed and made more consistent, and relieving congestion is often wrongly counted as a benefit to rail investment, rather than evidence of road under-supply.
- Market-based solutions, while disastrous in the railways, are far more appropriate for our road network which is inherently profitable. Funding investments in roads and interpreting current road taxes as road user charges would lead to much more efficient investment through predicting and providing.

- Roadtrack, a company owned by the Treasury, could be vested with the capital value of the existing road structure. It would charge prices for urban roads and collect fuel tax and vehicle excise duty to account for use of interurban roads. It could return a large dividend to its owner.

## **Introduction**

Network utilities constitute the infrastructure of an economy. They are often public utilities which require a fixed network to deliver their services. These networks are durable, capital intensive, and in general provide essential services to mass markets. Network utilities make up a large fraction of an economy's productive capital, in practice always larger than the share of manufacturing industry. Finding means of financing the maintenance and extension of this infrastructure of water, electricity and gas mains, and roads and railways, is a major task facing developed and developing countries.

Infrastructure investment is complementary with other investment in the sense that, rather like a fixed coefficients production function, not enough infrastructure investment constrains other investment, while too much infrastructure investment has no added value. To the extent that suboptimal infrastructure investment constrains other investment, it constrains growth. Telecoms and transport in developed countries have higher returns than other capital. This is either because investment in these generates positive externalities not captured by those undertaking it, or because there is not enough investment in these infrastructures.

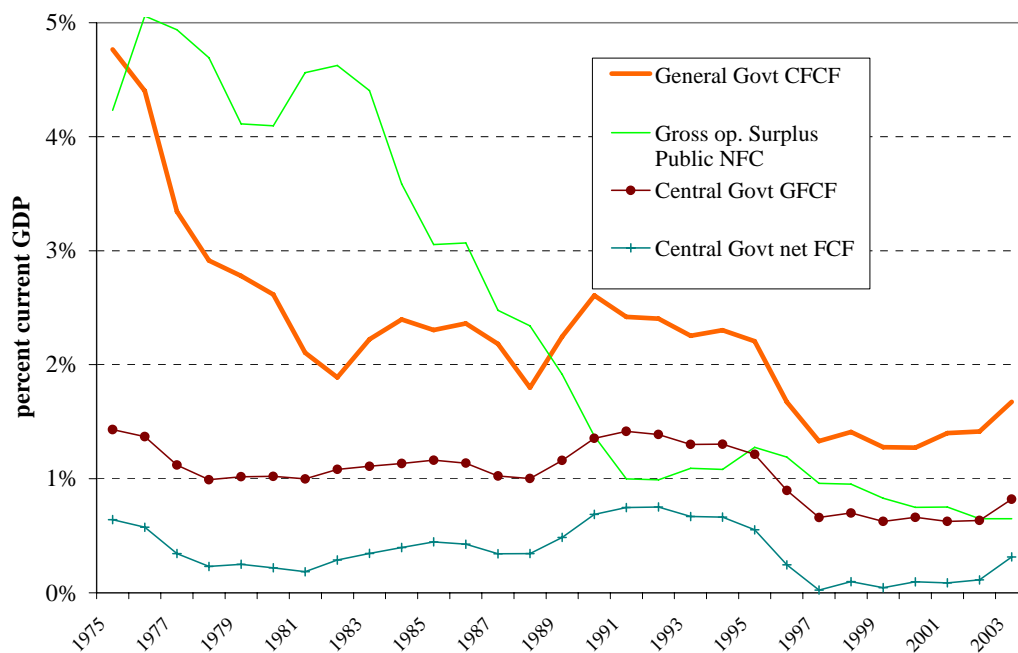
Network utilities are the clearest examples of natural monopolies, though the services provided over them may not be. A natural monopoly occurs when a single firm can satisfy the entire market demand for a range of goods or services at lower total cost than any other combination of firms. This monopoly power means that utilities are often publicly owned or, if privately owned, heavily regulated.

Recent UK history has shown that network utilities often fall into three categories: profitable privatised networks, unprofitable privatised networks and public networks. Profitable privatised networks, such as electricity and water, work well under well-designed incentive regulation. Efficient pricing leads to adequate finance; unprofitable privatised networks, such as Railtrack, are more problematic; while public networks, such as the UK's roads, may combine the worst of all worlds.

## Public investment

Public investment and savings have decreased sharply in the last three decades. For example the Treasury's own Blue Book shows that central government net fixed capital formation has fallen from about 6% of GDP in 1975 to almost zero in 1997, as Figure 1 shows. By contrast, gas, water, electricity and telecoms in private hands but with appropriate incentives from regulators have experienced sustained increases in investment. The central problem of regulation is to agree a regulatory compact which reassures investors that their sunk capital will be adequately rewarded, even though after it is sunk the opportunity cost of using it is low and regulators may yield to populist pressures to hold prices down to avoidable cost. An absence of regulatory commitment will lead to suboptimal investment in these critical infrastructures.

**FIGURE 1:** UK public investment and saving



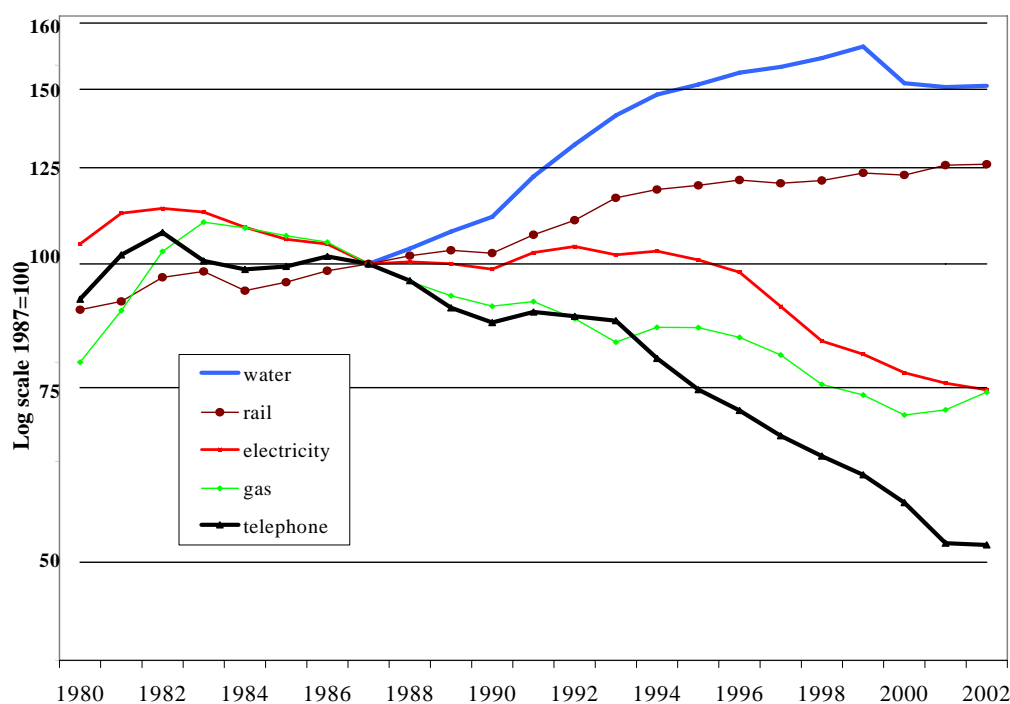
**SOURCE:** Blue Book (various issues)

In the UK the privatisation of gas, water, telecoms and electricity has resulted in utilities that are profitable and self-financing. They are subject to price regulation as opposed to the rate of return regulation common in the US. This takes the form of 'RPI-X' regulation where the price index,  $P$ , cannot increase

by more than the rate of inflation less an efficiency factor,  $X$ , in each year.<sup>4</sup> Regulatory commitment is ensured through a regulatory compact that reassures investors that their sunk capital will be adequately rewarded. Any arbitration of this compact is intentionally made costly for both parties in order to deter unnecessary appeals or regulatory opportunism. Quality standards are specified to avoid the risk that firms economise on quality in order to reduce costs.

Correct prices both ration a good and signal the need for investment more efficiently than any planner could. Price rises may also increase the revenue available to fund investment. Of course prices in regulated markets are not always 'correct' since they are subject to price control. The trajectory of utility real prices after privatisation has varied widely, as shown in Figure 2. For rail, price constancy has been problematic for investment. Water prices rose steeply, reflecting the need to finance needed investment. Telecoms prices have dropped the most (though their price-cost ratio may have risen).

**FIGURE 2:** Real UK domestic utility prices (log scale)



**SOURCE:** Monthly Digest of Statistics (various issues)

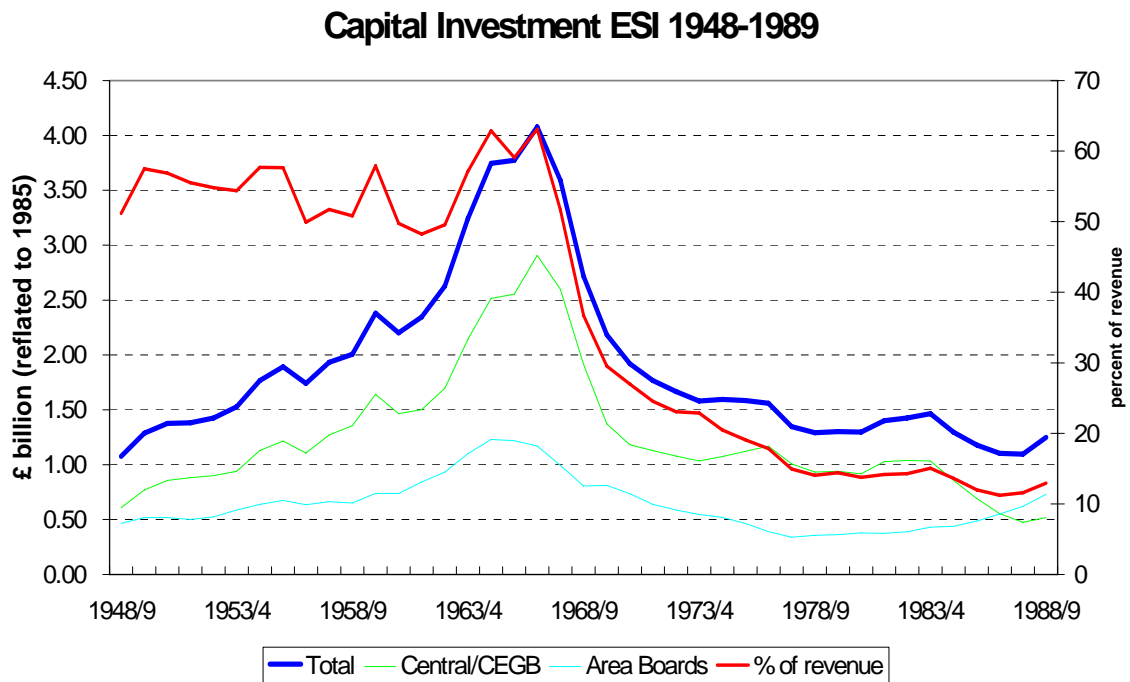
<sup>4</sup>  $P$  is an index representing a weighted basket of core services that are subject to regulation.  $X$  is the real rate of decline of prices.  $P_0$  is the level of this index in the year of privatisation or as reset at a subsequent price control. A well-defined methodology that takes into account the regulatory asset base (RAB), weighted average cost of capital (WACC), financial adequacy and benchmarking, is used to set  $P_0$  and  $X$  (Newbery, 1997).

## **The Case of Electricity**

In the case of the Electricity Supply Industry (ESI), generation and transmission were unbundled in 1989 before privatisation. Transmission became National Grid Company (subsequently National Grid Transco, NGT), initially jointly owned by the twelve electricity suppliers, the Regional Electricity Companies (RECs). Despite the embarrassing power cut in London in the summer of 2003, NGT has effective incentives to deliver reliability and has accordingly not underinvested. Since 1990 it has invested £3.5bn. Distribution and transmission investment together total £16bn, which exceeds the annual value added of the whole ESI (Roques et al., 2005).

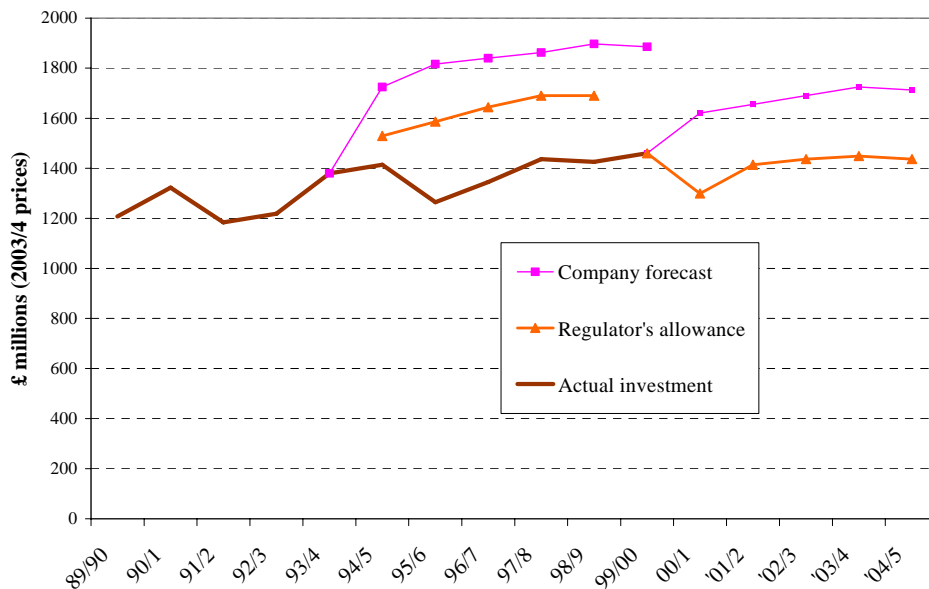
It should not be thought, however, that investment cannot also be adequately financed in a state-owned company, as ESI itself shows. Capital investment in ESI reached a peak in the late 1960s when it was a public corporation, as Figure 3 shows. Investment then fell with the slowdown in demand but since privatisation, has increased. As before under public ownership, there is inevitable haggling between the principal and agent over the right level of funding required, although the process and principal have changed. The price-cap system of incentives has meant that although companies initially may submit exaggerated forecasts of costs (shown in Figure 4), the regulator endeavours to obtain independent assessments of investment needs, while the price cap incentives deliver electricity at appropriate cost (although possibly a higher initial price). The Office of Gas and Electricity Markets (OFGEM) now provides incentives for timely expansion of network capacity. Nor has quality deteriorated. In fact there have been fewer interruptions of power since electricity generation passed into private hands.

FIGURE 3: Investment in electricity in England and Wales under public ownership



SOURCE: Electricity Council

FIGURE 4: The mismatch between company investment forecasts and outturns



SOURCE: OFGEM

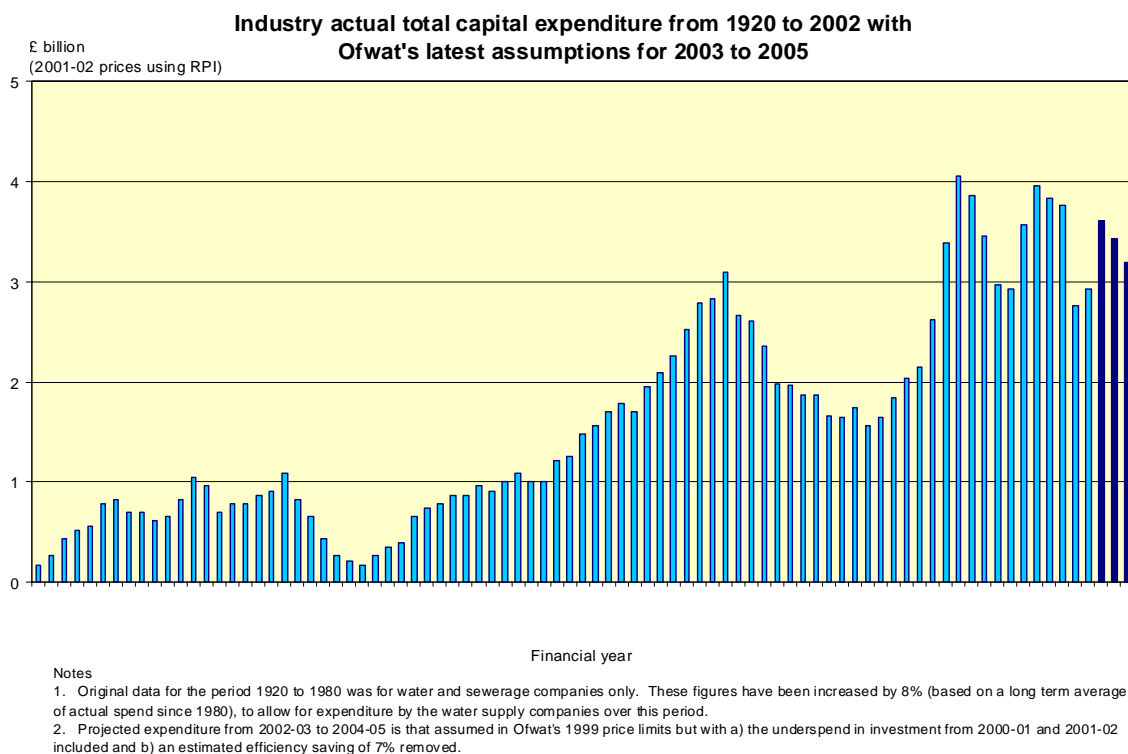
The privatisation of the RECs prompted a brief cost hiccup followed by the gradual decline of controlled costs. The twelve RECs were privatised in 1990 subject to an initial price control until 1995. Each has a regional monopoly on distribution with prices periodically reset, more recently making use of

comparative benchmarking. Investment and quality were maintained despite a 25% fall in charges between 1995 and 2000. Initially there was little productivity gain, but since 1995 productivity has risen significantly compared with its long run trend. Efficiency gains to 2000 were £5.4bn (discounting at a real rate of 6%) with estimated possible future gains thereafter of £2bn (Pollitt and Domah, 2001).

## The Case of Water

Water too experienced high levels of investment under public ownership in 1950-1976. This fell significantly when the Government experienced the fiscal problems and associated International Monetary Fund (IMF) budget cuts of the late 1970s, as shown in Figure 5.

**FIGURE 5:** The rapid increase in public investment until 1976

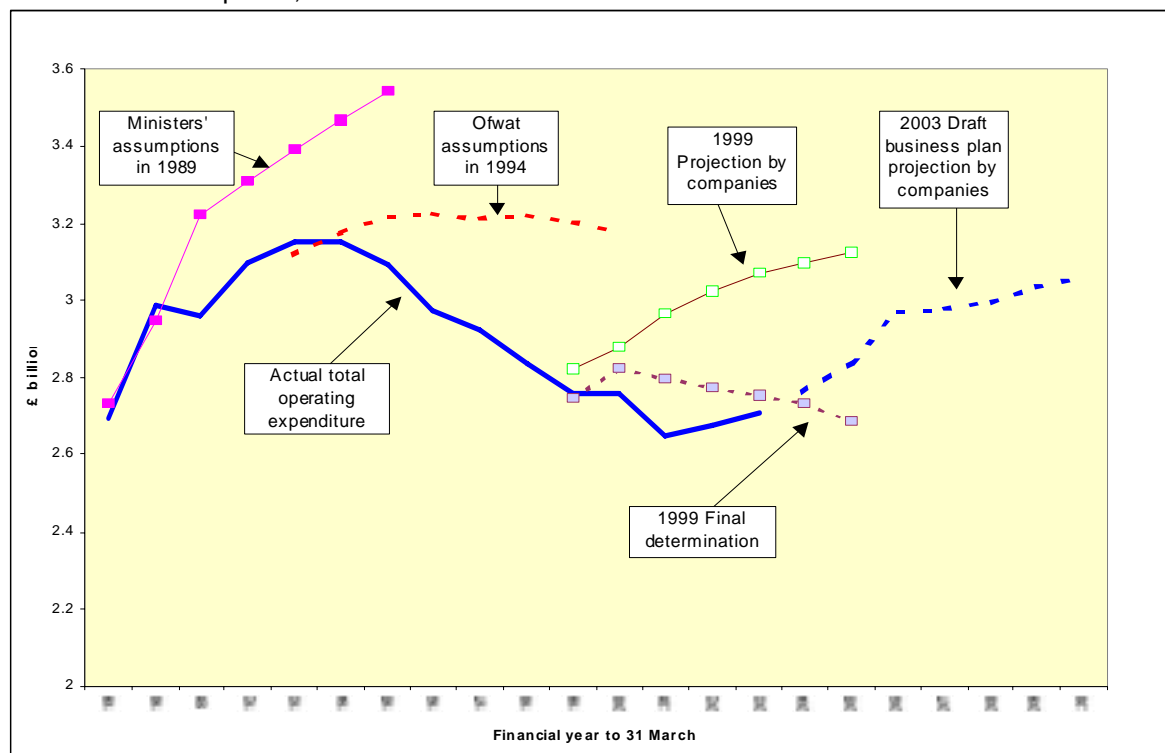


**SOURCE:** OFWAT

Thereafter the price level became increasingly unable to finance the network's investment needs. Investment could only be restored with a large (if gradual) increase in prices. Arguably the fact that this was politically more attractive if done by the private sector favoured the decision to privatise in the 1980s. So in this sense the price rises since privatisation have been economically

necessary. Over time the Office of Water Services (OFWAT) has proven itself able to ensure continuing cost efficiencies, shown in Figure 6.

**FIGURE 6:** Comparison of operating costs of Water and Sewerage Companies in England and Wales in constant prices, 1989 – 2003



SOURCE: OFWAT

In 1990 the regulatory asset base (RAB), the assessment of the public company's assets used by the regulator to set prices, was less than £10bn while the net replacement cost of the capital (modern equivalent value or MEA) was about £150bn, meaning that prices reflected less than 10% of the replacement capital cost. RAB and MEA are generally different because typically the replacement cost of a network is greater than its privatisation value, which reflects expectations about future allowed prices. But in this case the huge disparity derived from a political desire to ensure price continuity pre- and post-privatisation. The low RAB was essentially equivalent to a suboptimal  $P_0$ , i.e. one too low for the financing of necessary investment (see footnote 5). As a result a 'K factor' was introduced to reassure investors, allowing prices to rise annually by an additional K% on top of the RPI-X. With this in place prices gradually rose, financing investment to augment the RAB so that it would eventually approach the MEA.<sup>5</sup> Extra investment was also needed because of a duty to meet new EU standards that had not been subjected to a proper cost-benefit analysis (CBA). Would a public owner have

<sup>5</sup> Newbery (1997) discusses the role of the RAB in price-cap regulation.

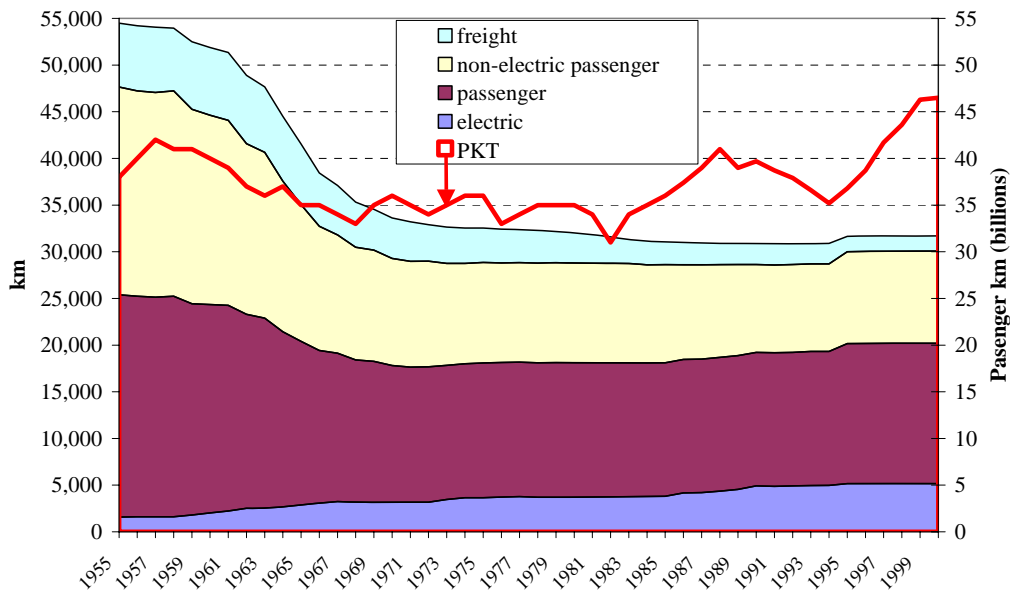
been better able to resist these standards? The example of Scottish Water suggests not.

### **The Railways**

The privatisation of British Rail (BR) provides a counterexample to the apparent success of privatising networks. BR, a vertically integrated utility, was drastically unbundled in 1993 into more than seventy companies with one regulated monopoly owning the network (Railtrack) and many more train operating companies (TOCs) supplying the services on the network. This was a more ambitious privatisation than the others, in many of which intact monopolies were simply transferred to the private sector.

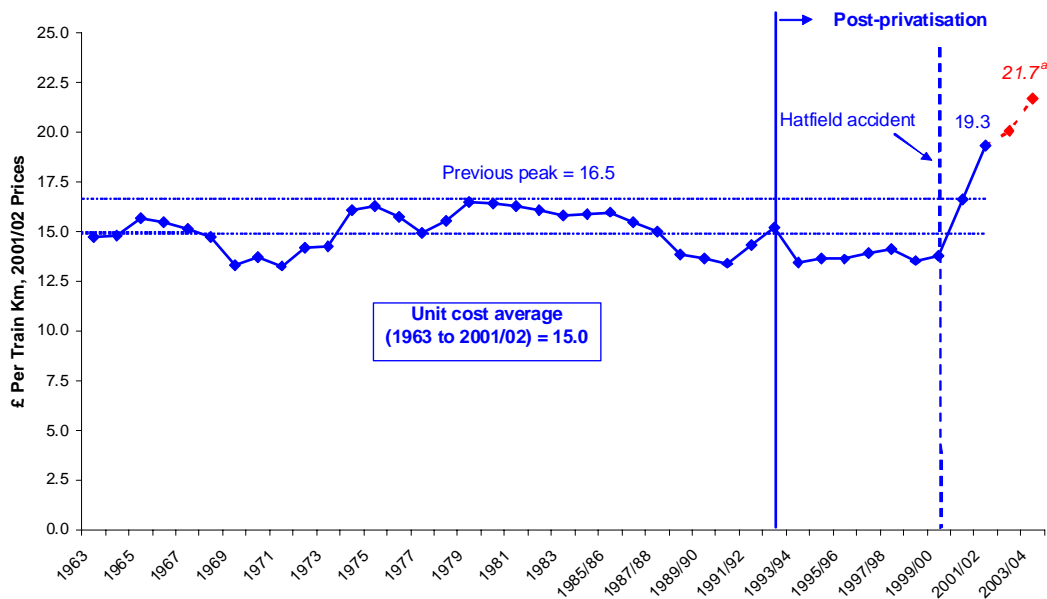
Figure 7 shows the drastic reduction in track length post-Beeching, the static passenger traffic until privatisation and the subsequent rapid increase. Building and maintaining the track post-privatisation became the responsibility of Railtrack, or, since 2001, Network Rail (NR). Railtrack was a monopoly regulated by the Office of the Rail Regulator (ORR). There is a market for supplying train services on the network that is subject to periodic competitive tendering. NR charges the TOCs for track access at prices controlled by the ORR. TOCs can then bid for subsidies and the Strategic Rail Authority (SRA) funds this and meets any regulatorily-caused increases in costs that TOCs might face. Railtrack (and now NR) charges TOCs the amount it costs to maintain the infrastructure. But since this is always more than TOC fare revenue, the TOCs are subsidised.

**FIGURE 7: British Rail track length and passenger kilometre travelled, 1955 - 2000**



**SOURCE:** Transport Statistics Great Britain, Department for Transport

**FIGURE 8: Rail industry cash costs per train kilometre at constant prices**



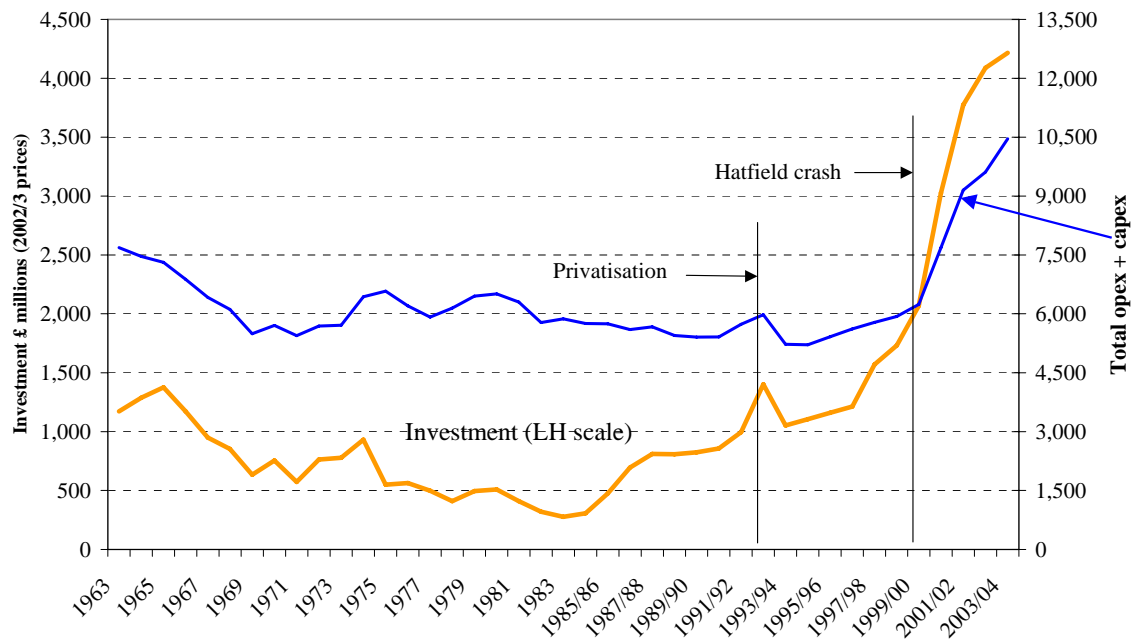
(a) Note: preliminary estimates for 2002/03 and 2003/04 are based on rises in Network Rail costs since 2001/02. Other industry costs are assumed constant in real terms, as data is not yet fully available beyond 2001/02. See Smith (2004), Institute for Transport Studies Working Paper, no. 585; also forthcoming in the Journal of Transport Economics and Policy.

**SOURCE:** Smith (2006)

Privatisation lowered the costs of the railway from 1993 until the Hatfield crash in October 2000 as Figure 8 shows (Pollitt and Smith, 2001). At this point safety regulation hugely escalated costs requiring large investment in network replacement, shown in Figure 9 (Smith, 2006). In effect the price control

hitherto had underestimated the track costs required by the new safety regime. The cost of maintenance had proven hard to predict. So too had the cost of expansion. The West Coast Mainline's projected costs went from £2.5bn to £5bn to £12bn. After the Hatfield crash, Railtrack failed to ask for a reopening of the price control and so the Government put Railtrack into administration, effectively renationalising Railtrack, and replacing it by Network Rail as a public-private partnership.

**FIGURE 9:** Investment and total operating and capital costs at constant prices

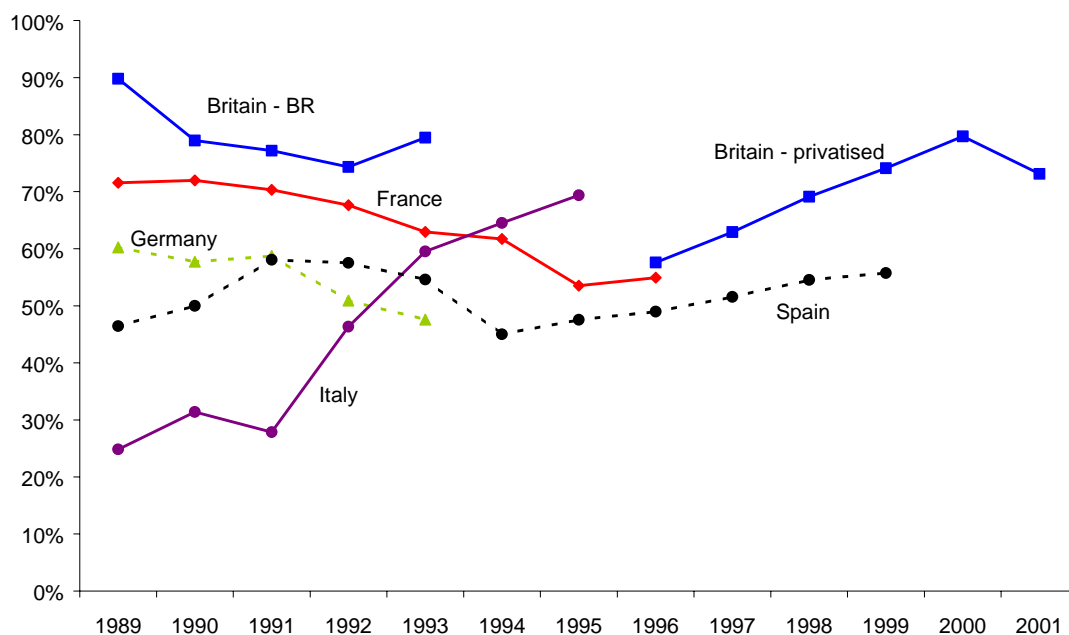


**SOURCE:** data supplied by Andrew Smith

Railtrack arguably failed because railways, unlike other utilities, are intrinsically unprofitable. The fact that social benefits *may* well exceed costs argues for public ownership. Yet although all railways are unprofitable, they are less so in the UK than on the Continent, as Figure 10 shows. The main problem was that, as with water, there was a mismatch between the value of the asset and the cost of maintaining or adding to the network. Whereas the value of water was sufficiently high to justify the costs of the investment needed (and water was a monopoly), the investment costs in railways proved wildly unpredictable, while rail faces intense competition from road traffic. In the railways the asset base and equity are unsuited to such risks, and the ultimate financier, the Government, was unwilling to underwrite escalating and apparently uncontrolled subsidies to a private company.

Could the new model, as represented by NR, work? Theoretically it could if the ORR determined the prices and the Government (HM Treasury/ Department for Transport) acted as an informed buyer by determining demand (after sensible cost-benefit analysis) and offering appropriate subsidies. In practice the Government may lack the political will to act as an informed buyer. Unwilling to drop services (to stop demanding even when the price is too high) the Government may wait for costs to fall while engaging in creative accounting. At least under the old partnership of a parsimonious Treasury and British Rail an admittedly inadequate service was maintained at far lower cost, probably with a higher net social benefit.

**FIGURE 10:** Cost recovery ratio (non-subsidy revenue/total costs) for various countries



SOURCE: data supplied by Andrew Smith<sup>6</sup>

### Roads: Roadtrack?

Roads are a costly and scarce resource and so many economists argue they should be rationed by price. Price not only rations but also signals the need for investment. There is no dispute that both road and rail can make an important contribution to the overall efficiency of our transport system. The evidence strongly suggest that, at the margin, road investment is more attractive than rail. This is not the conventional wisdom as rail travel is seen as having the benefits of alleviating road congestion. But once we accept that

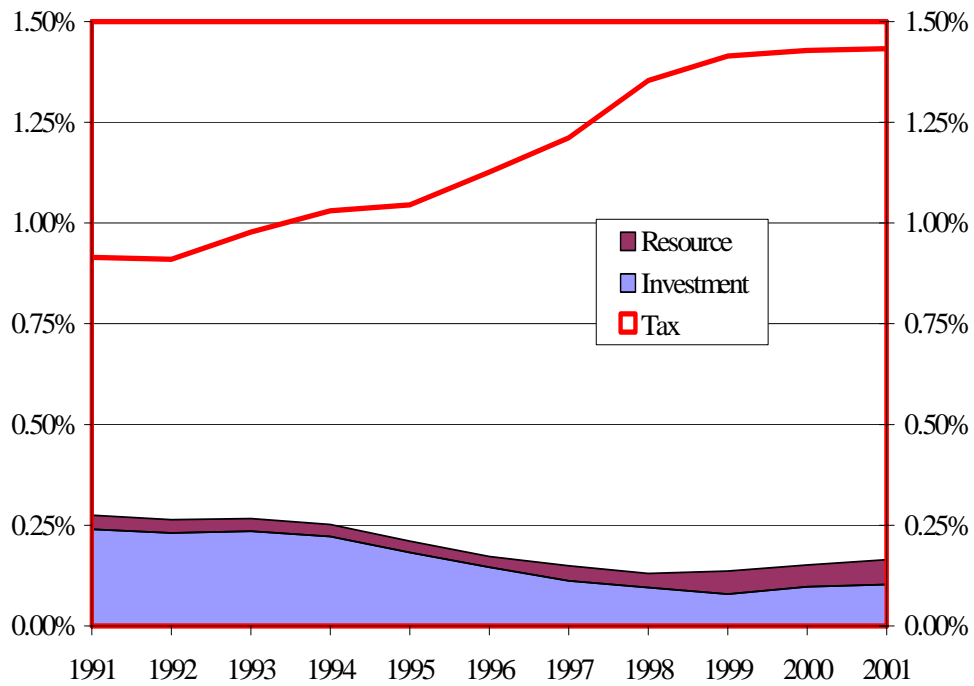
<sup>6</sup> The apparent drop in the cost recovery ratio after privatisation is in part caused by accounting policy changes. See Pollitt and Smith (2002), Appendix B for further details.

road building is not wrong in itself this argument breaks down; it is a perverse transport policy that justifies (private) rail investment as offsetting the (public) investment failure in roads which causes congestion. As a result, roads are undersupplied and overcharged. There is no clear strategy for their financing or charging. More seriously, road investment is dwarfed by rail investment with recent studies showing investment per kilometre travelled to be nine times higher for rail.

The present system fails in that there is no relation between road costs and road tax and no link between revenue and investment. Despite sophisticated CBA, the Government is often failing to make socially profitable investments. The fact that roads in almost all developed economies show considerably higher returns than the cost of capital means there are too few roads. Tax revenue gathered from road use is ten times the expenditure on roads, as Figure 11 shows, while road tax revenue produces a 21% return on the asset value of motorways, for example, as Figure 14 below shows.

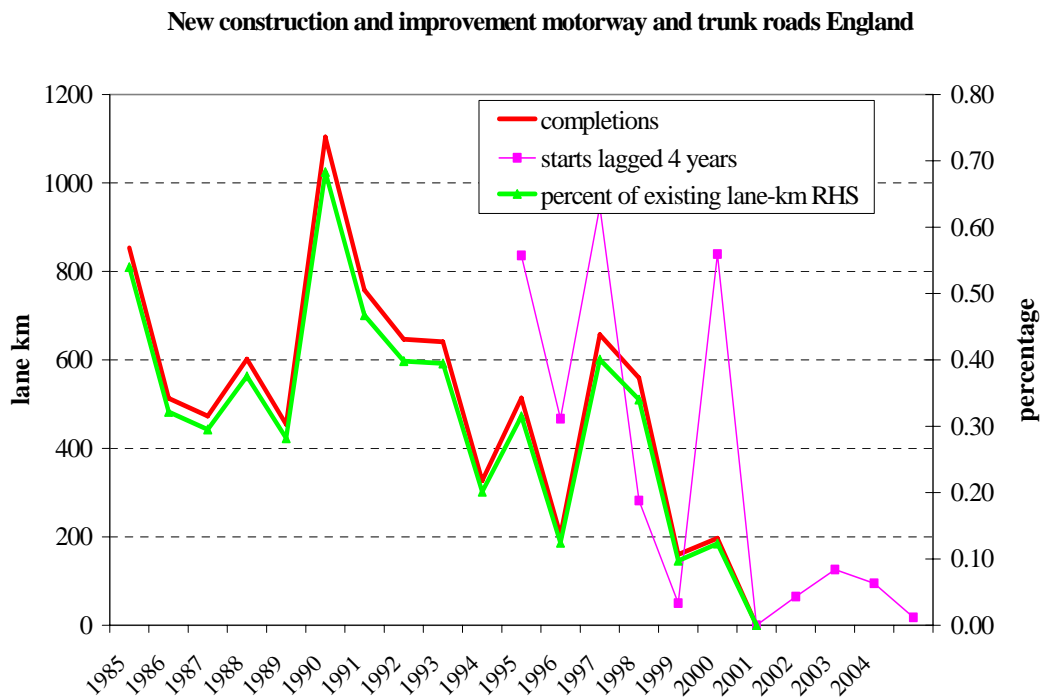
There has recently been a catastrophic collapse in road building in favour of rail and this is perpetuated by the recent Ten Year Transport Plan as Figure 12 shows.

**FIGURE 11: Tax and expenditure on strategic roads as shares of GDP, 1991 - 2001**



**SOURCE:** Transport Statistics Great Britain, Department for Transport

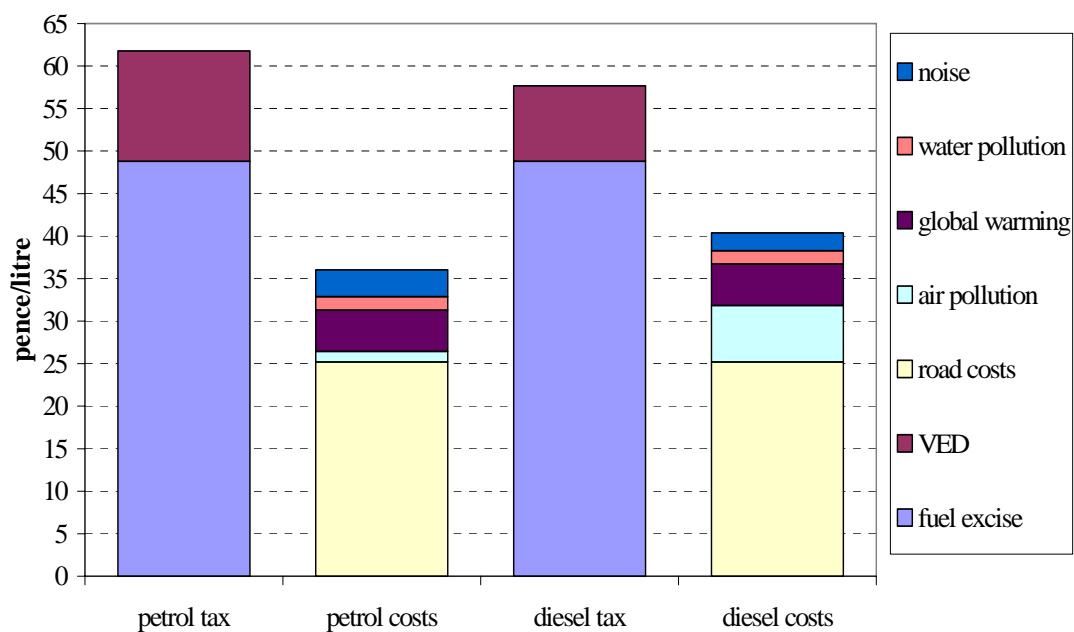
**FIGURE 12: The low level and collapse of road building in England**



**SOURCE:** Transport Statistics Great Britain, Department for Transport

Road pricing has become fashionable recently given the success of the Congestion Charge in London. Of course roads are already priced, but priced wrongly (Newbery, 1995). £27.7bn was raised in 2001-02 from fuel excise and vehicle excise duty (VED) while the resource costs of roads were £13bn to £15bn and the externalities less than £5bn, as Figure 13 shows (Newbery, 2002, 2005). The surplus tax revenue of over £8bn is more than double the value of the road investment in that period.

**FIGURE 13:** The relationship between road tax revenues and road costs, 2002



**SOURCE:** Newbery (2002, 2005)

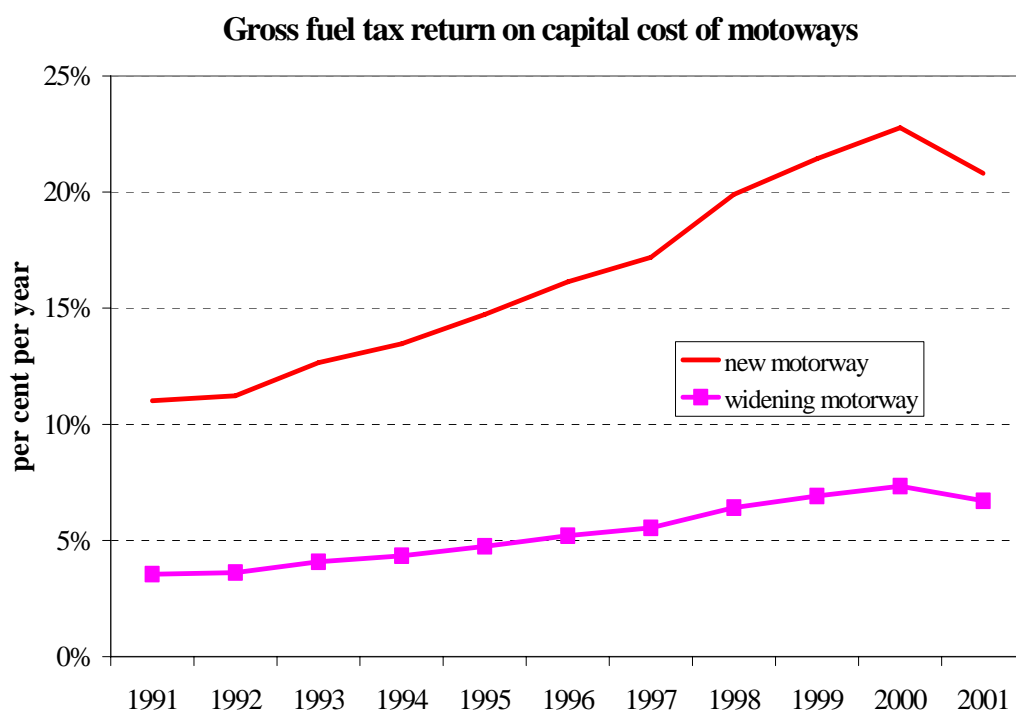
Urban road pricing does make sense with the caveat that if charges greatly exceed the resulting motorist benefits from lower congestion they will be resisted. Hence they must be part of an integrated approach in which road fuel taxes are also adjusted as urban road pricing is introduced. The fact that inter-urban roads can be expanded at roughly constant marginal cost considerably below current road taxes means that the present system of charging through road fuel tax gives rise to deadweight losses while failing to finance the needed expansion. In this case a modified and lower fuel tax would act as an efficient charge, rather like a shadow toll, complementing urban road charges.

One can envisage a Roadtrack as an infrastructure company along the same lines as the National Grid Company or Transco (or even Railtrack). Roadtrack,

a company owned by the Treasury, could be vested with the capital value of the existing road structure. It would charge prices for urban roads and collect fuel tax and vehicle excise duty to charge for use of interurban roads. It could return a large dividend to its owner. With roads, unlike other utilities, the Government merely has to make provision for organising the infrastructure and can then allow private agents to supply the services on that infrastructure. This makes a market-based solution for roads significantly more straightforward than one for rail. There is far less variability in costs for road than for rail because roads (at least outside urban areas) are standardised engineering undertakings needing modest adjustments to deal with varying landforms, whereas most rail expansions encounter problems of expensive bridge or tunnel expansions.

A market-based solution need not mean privatisation. Roadtrack could be owned by the Treasury. It would receive a regulated revenue from road taxes and prices. It would commission and finance investment and, crucially, be able to pay a large dividend to its owner since investing in roads is profitable (see Figure 14). Some of this dividend could be ploughed back into the building of the socially profitable roads that a failure to respond to favourable CBA assessments is currently impeding. Urban road prices could be regulated by an 'OFTRANS'. Fuel tax and VED, standing in for interurban road pricing, would collect any shortfall from road prices. As long as these changes were revenue neutral overall, the majority of motorists would benefit from the change and should be willing to support the reform.

FIGURE 14: Treasury returns to motorway investments



SOURCE: own calculations

With correct price signals and resulting revenue flows, Roadtrack could both predict and provide. Demand for the use of the most congested roads would fall. In equilibrium, road charges would approximately equal road costs. Depending on location, road charges would fall below current levels (non-urban) or substantial road investment would be justified (some urban areas). Another advantage would be the huge fall in national debt once Roadtrack was vested with the capital value of the existing road infrastructure. The Golden Rule has led to timidity in public investment. This phenomenon of resource accounting, new to the public sector, means that public road costs have risen by the interest value on the asset. Transferring roads as assets would get round this. Redefining road taxes as road user charges would reduce tax as a proportion of GDP by 2%.

## **Conclusions**

Adequate infrastructure is critical to the performance of any economy, but ensuring that it is delivered in sufficient amounts and in a timely and efficient manner is challenging. The state has the resources to do this, but often lacks the incentives to do so efficiently or the will to raise the funds to do so adequately. Intrinsically profitable networks such as gas, electricity, water and telecoms, can deliver efficient investment under well-designed incentive

regulation under private ownership. Loss-making networks such as rail are problematic, as independent regulation requires the state to act as an informed customer providing subsidies to make up the short-fall between social and private profitability but without direct control over spending; a model that arguably failed in the UK. The road network is also critical for efficient logistics and is seriously under-supplied and constraining UK productivity, as measured by the gap between social benefits and the cost of expansion. The regulatory model that works well for privatised profitable networks might also work well for the public but also profitable (measured by road charge contributions) road network.

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# **New Regulatory and Business Challenges in Network Industries**

Jean Tirole

## **Summary**

Jean Tirole defined and explained the workings of two-sided markets, markets in which two sides have to 'get on board' of a shared 'platform' in order to interact. Using examples he elaborated pricing rules of these markets and outlined some policy implications.

## **Two-sided markets**

What do the Financial Times, the London Stock Exchange, British Telecom, the Sony PlayStation, Windows, American Express, Google, and your local real estate agent have in common? Well, they are two-sided platforms, whose business model requires bringing two (or more) sides of a market on board. For example:

- A videogame platform such as the PlayStation (or an operating system such as Windows) needs to attract both users and game (application) developers. Gamers won't buy consoles on which few games are available and game developers won't write onto platforms whose consoles have low consumer penetration.
- Advertising-supported media such as newspapers, TV stations or Internet portals must attract both eyeballs and advertisers.
- Payment systems (American Express, Visa, MasterCard) must ensure that their card is accepted by merchants and held and used by shoppers.
- Phone calls, whether fixed- or mobile-based, require that both the caller and the receiver find it worthwhile to subscribe to an operator, to exchange each other's number and to actually use their phones.

Operators in two-sided markets face a chicken-and-egg problem as to how to get both sides on board and induce them to use the platform, while making money overall. There are also public policy implications which will be explored later.

As a further definition, a two-sided market is a market where the price structure, and not only the price level, matters. (Compare this with a VAT, where the level of the tax matters but its legal incidence does not). The price structure matters in the following circumstances:

First, the price structure matters where transaction costs are significant: e.g. if you download a paper from a website, the server pays a small charge to its Internet Service Provider (ISP), but that charge cannot be passed on to you as the transaction cost is too high (although “micro-payments” are about to make such transactions easier). The incentive to put material online therefore depends on the charge levied by the ISP on both sides.

Second, the price structure matters where the two sides in the market cannot negotiate with each other. For example, the fixed fees levied on the parties to cover the cost of building the platform are not amenable to negotiation between the two parties, so the platform’s decision about how to structure those fees is significant.

### **Business strategy in two-sided markets: pricing rules**

We first consider business strategy. Informally, our framework is one platform, on which a buyer and a seller transact. This could be American Express or Windows, or a games console such as the PlayStation. The platform can charge two prices to end-users:

- (i) the fixed charge,  $A_B$  or  $A_S$ . This is the annual fee for the credit card, or the price of the OS software or game console.
- (ii) the user charge per transaction,  $a_B$  or  $a_S$ . For credit cards, the merchant pays 1% or 2% per transaction, say (the number varies substantially across countries and type of card). The cardholder pays 0 or a negative price (receives a cash-back bonus or frequent flyer miles).

If you are a business manager, how should you set your prices? Should the burden be placed more on the buyer or on the seller? How do you allocate your costs? Whom shall you tax?

The first rule is, you should charge what each side can bear. You want all sides to get on board, so you should set the price on each side so to avoid losing customers.

A good illustration is the markedly different business models adopted by credit and debit cards. When credit cards were first available in the 1950s it was very difficult to get customers to start using them. So the interchange fee was set at 7%, and the card was “cheap” to the customer. Over time, the fee has gone down, but it remains at the high level of 1% or 2%, because the merchant still finds it worthwhile to accept a card at that level. The cardholder side is elastic, and the merchant side is inelastic over a range – so the pricing structure is designed to get the cardholder on board.

Online debit cards are different - at least in the US. There is a low interchange fee, and the card is less attractive to the consumer. In this case the merchants are the side of the transaction with the greater elasticity. Cardholders already

have an ATM card, so there is no need to worry about getting them on board. But merchants have to install a terminal in order to accept debit cards. So in the initial phase, the pricing structure had to favour the merchants.

The general principle often leads to a choice of a highly asymmetric pricing structure. There are many examples of platforms that are entirely free to one side:

- PDF reading software is given away for free, but it is expensive to create PDF files. This is because writers want to be read more than readers want to read them.
- For an operating system like Windows, only the consumer is charged, and Microsoft loses money or only breaks even on developers of Windows applications.
- Internet browsers are free to users, as are portals like Google. Newspapers are very often free or sold below cost to readers, and so is most television.

This can be understood as price discrimination in a sense: subsidising one segment and taxing another.

So the first pricing rule is to look at what each side can bear. The second and related rule is 'mind the externalities': What does each side bring to the other? There may be certain customers on one side of the market, "marquee buyers", who are extremely valuable to customers on the other side of the market. The existence of marquee buyers tends to reduce the price to all buyers and increases it to sellers. For example, American Express has been able to charge a relatively high merchant discount as compared to other card brands, because merchants view the American Express business clientele as extremely attractive. Corporate expense clients are "marquee" customers that allow American Express to raise its prices to the other side of the market, merchants. A similar phenomenon occurs when certain customers are extremely loyal to the two-sided firm – perhaps because of long-term contracts or sunk-cost investments.

The third pricing rule relates to sequentiality. One must promote and advertise a new computer operating system two to four years in advance. As developers will have to spend large amounts of money, they will ask themselves whether there will be anyone on the other side in two to four years time. So the X-Box, for example, was a big risk to developers.

One solution is vertical integration. Microsoft produced many games itself at first for the X-Box.

Another solution is royalties. The preferred business model for game consoles is to sell the console to consumers at below cost (Microsoft is reported to lose at least \$100 per console), and levy royalties on a per-unit basis (about \$8 per

game). Interestingly, charging developers in this way gets them on board at the start, because it represents a big commitment by Microsoft or Sony to get a lot of users on board – their profitability depends on it.

The fourth pricing rule relates to the impact of multi-homing. Users benefit from interacting with each other through platforms. There are two broad ways in which users can have access to other users that are served by suppliers different from their own. In telecommunications and the Internet, platforms are interconnected. Telecom operators terminate each other's traffic in exchange of "termination fees". Many platforms, though, are not interconnected. You cannot use your American Express card at a merchant who accepts only Visa and MasterCard. You cannot use an application written only for Windows onto your Linux operating system. Connectivity is then achieved through "user multi-homing". Merchants may accept all cards, or you may have both an American Express and a Visa card in your pocket. Game developers may write their games in two versions for the PlayStation and the X-Box. Or, if real estate agents do not agree on a common listing, real-estate buyers and sellers may use the services of several agencies simultaneously.

Multi-homing matters for the choice of business model. Let's assume that buyers single-home and sellers multi-home. This would be the case with video games, if developers released their games titles on all formats; the same would have applied to credit cards, back when consumers only had one card each. The key concern for platforms is then to attract buyers, who are unique. The platform provides a monopoly route to the buyer, so it can charge a monopoly price to the seller. The lesson here is to charge a very low price in a single-homing market, but a high price to the multi-homing market.

The story of the decrease in merchant discounts is illustrative. American Express, while still quite expensive for merchants, has reduced its merchant fee substantially. In the past, most shoppers had a single card in their pocket. With the advent of no-fee cards in the US, Amex customers started having also Visa cards in their pockets. Merchants understood this, and could more easily turn down the high-fee Amex card without losing patrons. Amex was thus forced by increased multi-homing to lower its merchant discount.

### **The Platform as a Regulator**

Platforms heavily regulate interactions between their end-users, often by constraining the sellers' ability to extract surplus from the consumers. For example, a software platform such as Palm or Windows may want to promote competition among developers. This raises surplus on the user side, and so the platform is able to charge higher prices to users. When competition does not suffice, the platform may want to cap the price charged by the sellers (e.g. the 99 cents cap imposed by Apple on music publishers for song downloads onto the iPod; similarly, Amex may impose a 'no discrimination rule', effectively a price cap of 0% to prevent merchants charging cardholders for using their card.)

Platforms also perform a number of standard consumer protection services (information, licensing, settlement, and enforcement). This includes for example checking the solvency of participants in a financial platform.

It is interesting to contrast such strategies with those of, say, an owner of intellectual property (IP); IP licenses are often exclusive and further put few restrictions on the licensee's ability to extract consumer surplus. The difference with two-sided platforms is that the licensor has no interaction with the final consumer and so cannot benefit from an increase in consumer surplus. Platforms are more protective of buyers' interests and less protective of sellers' interests.

### **Public policy concerns**

Many platforms have market power. Are they behaving properly or are they abusing their position? Should authorities intervene? The two-sided platforms' balancing act has lately come under antitrust and regulatory scrutiny. For example, interchange fees (which in credit card associations determine the split between merchants and cardholders) are under investigation around the world. The same goes for termination charges in telecoms.

Standard antitrust practice must be amended for two-sided markets: take as an illustration the concept of predation, the act of charging below-cost prices to drive competitors out of the market. As we have seen, in many industries, platforms charge nothing to one side. By standard tests, this unambiguously is predation. But both the theory and the practice of two-sided markets shows that such pricing, besides making good business sense, is evidence neither of market power - consider free nightclub entry for women or free newspapers - nor of socially inefficient behaviour - it gets all sides on board after all. Two-sided markets, like other markets, may raise serious competition policy concerns. Policy-makers, like private decision-makers, however must adjust their thinking to reflect the specificities of such markets.

*Related papers can be found on Institut d'Economie Industrielle (IDEI's) website <http://idei.fr/>, including some references to non-technical papers.*

# **Savings and Pensions**

# **Consumption, Savings and Incentives: Facts, Puzzles and Policy Implications**

Richard Blundell

## **Summary**

Richard Blundell spoke on consumption, savings and incentives. The lecture covered four key puzzles of interest to policy-makers:

- Why consumption drops sharply at retirement;
- Why tax incentives for saving may have little overall impact on the quantity saved;
- Why life expectancy is systematically underestimated; and
- Why the young hold so much of their wealth in housing while the old consume so little of their housing wealth.

## **Introduction**

There are three key questions in this area of interest to policy-makers:

- Do individuals save enough to cover expected changes in lifecycle needs?
- Do individuals save enough to insure themselves against unforeseen events?
- Are tax incentives for saving effective?

The appropriate analytical tool is a model of lifecycle consumption and savings behaviour. This encompasses a decomposition of income into permanent and transitory components, and captures the main determinants of saving behaviour (as originally noted by Keynes): impatience, anticipated needs, intertemporal substitution, precautionary saving and bequests.

Analysis can then be framed by considering a series of puzzles – questioning why real-life behaviour deviates from that predicted by standard economic models.

## **The retirement-savings puzzle: why consumption drops so sharply at retirement**

The retirement-savings puzzle relates to the path of consumption growth over the lifecycle. Models of consumption growth calibrated for UK households perform reasonably well, with the exception of an apparently unexplained drop in consumption at retirement (see Banks, Blundell and Tanner, 1998). This may reflect realisation of inadequate saving for retirement, but there may also be some shocks at or around retirement that are not well insured. This particularly applies to those without occupational pensions who also experience unexpected early retirement (see Smith, 2006.) This group tend to see the largest drops in their consumption and their standard of living at

retirement. So those on low incomes and with no occupational pension could benefit substantially from some form of actuarially fair early retirement scheme within the state earning related scheme. This will become even more important if there is pressure to increase the retirement age within the state system.

The recent falls in expected pension incomes and pension wealth will also affect saving and early retirement decisions, with those who are healthy and in more flexible pension schemes more likely to work longer. Data from the newly available English Longitudinal Study of Ageing (ELSA, see Banks et al., 2003) can inform our understanding of these decisions. Controlling for demographic effects, the analysis of ELSA has shown that pension wealth has a strong impact on early retirement. Moreover, those individuals with defined benefit pensions subjectively assess a lower probability of being in work at age 60, while those with defined contribution plans assess a higher probability<sup>7</sup> (see Banks and Blundell, 2005). As newly retiring cohorts begin to rely less on final salary defined benefit pensions we might expect retirement decisions to respond as much, if not more, to changes in the value of pension savings. So part of the pension savings shortfall should be corrected by changes in the value of pension savings and in delaying retirement. Certainly we might expect this to be the case for those in the middle to upper part of the income distribution who also have occupational pension schemes and are likely to be in good health.

However, even for those individuals with reasonable levels of pension wealth there are some reasons for caution. Individuals approaching retirement may tend to underestimate the burden of health problems (taking generally younger work colleagues as a reference point) and also underestimate life expectancy (taking parents as a reference). On retiring, they are then forced to re-assess their financial situation resulting in a drop in consumption and living standards.

### **The savings incentives puzzle: why tax incentives for saving may have little overall impact on the quantity saved**

The savings incentives puzzle suggests that even large tax incentives for saving in specific assets may have only a small impact on aggregate savings. The main tax-neutral (in the sense of not distorting intertemporal consumption choices) savings vehicles in the UK are ISAs (and their predecessors, TESSAs and PEPs) – similar to 401(k)s and IRAs in the US. Theory suggests that for those already saving, these provide an unambiguous incentive to reorganise portfolios towards these more tax favoured assets, but an ambiguous impact on overall saving (as the income and substitution effects work in opposing directions). Only for non-savers (or for low-savers) does the

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<sup>7</sup> The returns from working an extra year are generally higher in later years for defined contribution (DC) – rather than defined benefit (DB) – schemes. In addition, DB schemes tend to have greater incentives for early retirement. Schemes where pension incomes are based on average salaries will have retirement incentives in between those for a final salary DB and a DC scheme.

presence of these tax-favoured savings vehicles provide an unambiguous incentive to save more.

Data from the 1990s on average TESSA balances indicate discernable jumps at the start of each financial year, suggesting that much of the funds subscribed to TESSAs were reallocated from other sources (see Attanasio et al., 2005a). Considering the introduction of ISAs, between 1998 and 2002, the proportion of families holding tax-free assets increased substantially - by around 12 percentage points, but the proportion with any financial assets (excluding current accounts) showed no significant change.

It may be too soon to draw conclusions from this particular experience, but tax incentives on specific assets do appear to have a large reshuffling effect on the portfolios of savers but only a small impact on aggregate saving – much as the lifecycle model would predict. We would expect some positive effects of ISAs among lower income households and there could be a learning process for new policies like ISAs, so that the current data may understate the take-up by those with previously no assets or very small amounts of assets. It would be useful to add a question to the next survey of ISAs, which will be conducted in the New Year, to ask people when they first took out ISAs and when they became aware of them - to see if the poorer take longer to adopt than the richer.

There is also evidence from the US on the behavioural aspects of savings decisions. Company case studies suggest that participation in 401(k) plans is significantly and persistently higher among employees automatically enrolled in such plans (with the option to opt-out) compared to those required to opt-in (see Laibson et al., 2005). This interesting work suggests that individuals often follow a 'path of least resistance' when making portfolio saving decisions. Although the impact on overall savings appears to be much smaller.

### **The annuity market/life expectancy puzzle: why life expectancy is systematically underestimated**

There are systematic errors in estimates of life expectancy. Actuaries are notorious for having systematically underestimated the increases in life expectancy over recent decades, see Costa and Lahey (2005). Placing more strain on annuity markets as longevity 'surprises' occur.

What is perhaps more worrying, or at least as worrying, is that, according to new results from ELSA, individuals also systematically underestimate their life expectancy, especially women. This would make annuities appear over-priced and may result in under-saving for consumption in retirement, and more specifically in insufficient resources to cope in very old age. This must be a high priority for research and will be aided by the ELSA data.

## **The housing and downsizing puzzle: why the young hold so much of their wealth in housing while the old consume so little of their housing wealth**

The housing puzzle has two dimensions – why in the UK the young hold so much of their wealth in housing? Why the old consume so little of their housing wealth? (see Banks et al., 2004). The volatility of house prices in the UK and the insurance aspect of home ownership may account for high ownership rates at earlier adult ages<sup>8</sup> and explain some of the bias in savings toward housing. However, as Attanasio et al. (2005b) show capital gains on housing themselves do not appear to explain lower levels of saving (the exception is among older households, where recent research has detected a small impact of house price capital gains on consumption). Capital gains on stock market equity, however, appear to have a stronger offsetting impact on saving.

Home equity release and withdrawal schemes appear under-used – this may be due to adverse selection problems of the same kind that occur in the annuity market for pensions. It may also be due to imperfect information or a strong bequest motive among homeowners. However, the use of interest only mortgages to finance consumption in older ages and other forms of ‘downsizing’ are of growing importance and should be carefully researched.

### **Some thoughts on Government policy**

An important objective for the Government’s saving and assets policy should be a reduction in instances where individuals appear to be ill-prepared to meet increasing needs at older ages and under-insured against adverse economic and health shocks. Such occurrences are highlighted by unusually large falls in consumption and in reductions in the household’s overall standard of living. The puzzles analysed in this lecture have highlighted where these are likely to be most important.

Part of the rationale for support against adverse shocks for those in the lower tail of the income distribution starts with ‘insurance’ against shorter-term shocks, and makes sense to be seen as part of a ‘buffer stock’ savings model. It would be useful to monitor closely those groups at the lower end of the income scale. Understanding precisely what mechanisms, if any, low-income families have at their disposal to ‘insure’ against adverse health and economic shocks is important for public policy. Low income groups are likely to – or will need to – save for short-term fluctuations in their needs and their incomes. It may not be appropriate to provide incentives for low income households to save in long term retirement savings which penalise early withdrawals. Indeed, facing higher levels of income guarantees like Pension Credit in retirement, it may not make sense for such groups to save very much for retirement at all.

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<sup>8</sup> The UK has one of the highest home ownership rates in the world among younger age groups (but also the most volatile housing market). Housing prices are also among the most volatile in the world.

For those on low-to-medium incomes, and with no occupational pension, some form of actuarially fair early retirement scheme, within the state earnings related or state second pension scheme, could be highly beneficial. With the appropriate choice of accrual rates it could be designed to provide the correct incentives to work longer and save more where individuals are able to do so, while also providing an insurance against unexpected early retirement due to adverse health or economic events. The need for this kind of provision will become even more important as pressure grows to increase retirement ages and, with it in place, could make the inevitable increases in retirement ages much more acceptable.

Finally, financial education does appear important – especially any information/advice that enables individuals to decide what form of saving is best for them. Our understanding of cognitive ability and the way such abilities evolve with age among different groups in society is still in its infancy. The analysis from ELSA on the understanding of pension rules and the relationship to numeracy is already providing a much clearer picture of decision making abilities among the old. The results from behavioural economics suggest that, for some individuals, choices over saving may be far from optimal.

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# Reforming Public Pensions in the US and the UK

Peter Diamond

## Summary<sup>9</sup>

Peter Diamond presented an overview of proposed pension reform in the US, drawing out points of comparison with the UK.

President Bush's proposed reforms envisage a system of individual carve-out accounts where diverted payroll tax revenue would be treated as a loan from the Government, to be put into an individual retirement account. Social Security would track the amounts diverted to individual accounts and charge interest each year on the accumulated diverted funds, with the interest rate referred to as the offset rate. At retirement, a worker would repay the accumulated debt through a reduction in traditional monthly benefits, with the reduction sufficient to pay off the debt for a retiree of average life expectancy at that time.

Although at present the system is running a surplus, there is a projected financial shortfall in the system which is expected to run short of money, and need to cut benefits, in 35 years' time. This is in part because there will be a rapid rise in costs with the retirement of the baby boomers. Despite this, President Bush's reforms do not include the remedy of tax rises and the proposed benefit cuts together with the individual accounts are not sufficient to restore financial balance. The impact of the accounts on aggregate and individual saving is unclear.

## The current public pension system in the US

The US system has the twin goals of poverty alleviation and the provision of adequate income in retirement. It uses a progressive benefit formula to achieve this in contrast to the UK, which offers both flat-rate support and an earnings-related state pension. It provides a majority of retirement income for around two-thirds of pensioners. The progressive benefit formula in the US is a key part of providing higher replacement rates for those with lower earnings. The highest tier of the benefit formula, with the lowest benefit increase relative to lifetime earnings applies to roughly 15 percent of new retirees.

As with other countries, including the UK, there is a tension in the US between focusing on poverty among the elderly and focusing on replacement needs over a much wider swath of the population. Both are surely worthy social goals and both need to be preserved at significant levels. The need for concern beyond merely poverty is driven by the failure of much of the working population to accumulate sufficient financial assets for retirement.

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<sup>9</sup> For a full version of this talk, see Diamond, P. (2006) "Reforming Public Pensions in the US and UK." The Economic Journal, Vol. 116, Issue 509, pp94-118.

For the US Social Security system there is a payroll tax of 12.4 percent, half on employers and half on employees. The tax is levied on earnings up to a cap that is indexed to average earnings and was \$90,000 in 2005. Coverage is almost universal, with the only large group outside the system roughly one-quarter of state and local government employees. The monthly benefit varies with the age at which benefits start. For those who must stop working to receive benefits (until recently ages 62 to 65, but with the latter en route to 67), referred to as the earnings test or retirement test, the growth in benefits from a delay in their start is an incentive to continue working. For those who can receive benefits without stopping work, the growth in benefits from a delay in the start of benefits represents an incentive to continue working only for those who find the delay attractive and are also liquidity constrained if they do not continue to work.

US social security allows withdrawal of benefits from age 62, i.e. in advance of the normal pension age. At 62, the level of these benefits is (broadly) actuarially reduced. 62 is in fact the modal age of withdrawal in the US. This contrasts with the UK where the flexibility from 'deferrals' only exists for ages after the State Pension Age of 65. Additive deferrals (i.e. 10.4% for each extra year) in the UK create strong incentives to delay the start of benefits from 65 to 66 but these incentives are steadily diminished for those contemplating further delays at higher ages.

As for the private pension sphere, there is a sizable provision of funded pensions through employers and individual retirement accounts in the US and in the UK. At any time, roughly half the US labour force is participating in a plan. The US private pension sector has undergone a significant shift from defined benefit (DB) to defined contribution (DC) schemes over the last 25 years or so. 401(k) schemes are the predominant DC arrangement. This shift is a welcome development given that DB schemes have the feature of correlating funding difficulties with wider stress on the sponsoring employer; the result being problems in meeting the pension promise. So the difficulty in enforcing adequate funding for insured pensions (and the difficulty for workers in not insuring them) is one of the reasons the swing from defined benefit to defined contribution pensions should not be viewed with alarm, though there is a concern that some of the changes have been accompanied with large decreases in anticipated pensions. In the US, improved regulatory oversight for both types of pensions is needed.

### **The looming financial hole**

There is a projected financial shortfall in the system which is expected to run short of money, and need to cut benefits, in 35 years' time. At present the system is running a surplus, with revenues above costs. There will be a rapid rise in costs with the retirement of the baby boomers. A continuing slow rise in costs reflects the anticipated continuing increase in life expectancy at retirement, which raises the cost of a system defined in terms of monthly benefits. Since the system cannot borrow and has no *de jure* access to general revenues, it is constrained to paying benefits only from its trust fund

and from ongoing revenues. Hence without further legislation there would be a sharp fall in expenditures as payable benefits fall below scheduled benefits in 2041. In present discounted value terms, the shortfall of revenues over the 75-year horizon is \$4 trillion, or 1.8 percent of taxable payroll. Taxable payroll is roughly 40 percent of GDP.

### **President Bush's proposed reform**

Remedies include increased taxation and decreased benefits but President Bush is determined to introduce 'carve-out individual accounts' and not to raise taxes. These are in some way analogous to contracting-out in the UK. The reform consists of: (a) the offer of carve-out accounts, (b) no increase in taxes and (c) no reduction in benefits for those over 55. Individuals with sufficient benefits would be free to choose whether to annuitise these accounts at retirement (compare pension saving in the UK, where some annuitisation is compulsory).

The President proposed that mandatory annuitisation of the accounts would only extend to a level that, together with remaining traditional benefits, would keep a couple out of poverty. Thus the accounts would reduce annuitisation, which is viewed as a problem by some analysts who think that many workers do not appreciate the insurance value of real annuities.

An option for contracting out requires a rule linking future benefit reductions and current transfers for asset purchase. The President has put forward plans based on treating the diverted payroll tax revenue as a loan. That is, Social Security would track the amounts diverted to individual accounts and charge interest each year on the accumulated diverted funds, with the interest rate referred to as the offset rate. At retirement, a worker would repay the accumulated debt through a reduction in traditional monthly benefits, with the reduction sufficient to pay off the debt for a retiree of average life expectancy at that time. The calculation of both the debt and the annuity decrease depend on the interest rate chosen.

Workers would have a choice from a very limited set of alternative mutual funds – roughly half a dozen, with no choice among fund managers. The Government would aggregate the deposits and hold competitive bidding from private investment companies for the right to invest the money, based on index tracker funds – that is, funds that attempt to approximate the return from holding all the assets in a particular class. For example, there can be funds that approximate holding the entire stock market, or the set of large firms or of small firms, or all of corporate bonds.

This loan-based approach permits workers to recognise that opening an account would be worthwhile if they are willing to take on the added risk in purchasing stocks and corporate bonds in order to have a higher expected return. This might be simpler for workers to think about if the offset interest rate were indexed to Treasury rates rather than being set in advance. With indexing of the offset rate, a worker would find contracting out equivalent to

selling government bonds in order to purchase stocks. As such, it is of little or no value to workers with diversified portfolios in their retirement accounts outside Social Security. In contrast with the UK structure of a contracted-out rebate combined with forgoing a year's accrual in monthly benefits, this loan based approach should make clearer for workers what the choice is about and may improve the quality of decision making on whether to contract out.

Advocates of the accounts cite the diversity of attitudes toward risk as a possible source of an efficiency gain. But this only works insofar as people who do not already have a choice between stocks and bonds have a good understanding of the basis for choice. There is considerable evidence from choices made in employer-organised defined contribution pensions in the US that many workers make poor choices – after all it is not simple to understand the value of diversification or the nature of the risk-return frontier and the issues behind choosing a good portfolio. Too many workers invest heavily in the stock of their employer, hold money-market funds for long term investment, and try to time their moves between stocks and bonds in ways that increase risk and lower expected returns.

### **The effect on public finances of the Bush reform**

With a slow phase-in that eventually allows 4 percentage points of payroll to go into the accounts and the assumption that two-thirds of workers would elect to have them, the trust fund reaches zero over a decade sooner than without the accounts. Since diverted taxes occur decades earlier than repayment through reduced benefits, the cash flow is negative for roughly 40 years.

### **Solutions: benefit cuts – the UK solution in the 1980s**

The approach to benefit cuts receiving the most attention in the current US debate is often dubbed 'price indexing' and is similar to the approach taken by Mrs. Thatcher. After calculating benefits as under current law, benefits would be reduced to offset the effect of the rise of real wages from the start of reform. Calling this price indexing (it leaves a mixed price-indexed-wage-indexed system and may be more accurately called real-wage-deflating) led many early audiences to fail to recognise how large the benefit cuts are in such an approach. Under reasonable assumptions, the cuts would be very large eventually. Beyond the size of the cuts is the issue of whether it makes sense to do indexing in this form rather than just legislating specific cuts. The cuts would be larger the more rapid real wage growth, even though the financial position of Social Security is improved, not worsened by more rapid real wage growth.

If one thinks about providing retirement benefits in terms of a given level of real benefits, such an approach makes sense. However, if one thinks in terms of replacement rates, recognising a need to adjust replacement rates for financial affordability, then this approach to indexing does not make sense. I

think it is important that replacement rates be the centre of analysis for the portion of pension design aimed at those who are above poverty levels (and a similar argument holds for poverty alleviation when poverty lines are defined in relative terms as opposed to real terms). Thus this price-indexing approach does not fit with what public pensions should be trying to accomplish.

The President has endorsed only partial use of price indexing – applying it fully to those with maximal benefits, not at all to those in the bottom 30 percent of the earnings distribution and proportionally in between. With less benefit cuts than with full price indexing, the President has not put forth sufficient benefit cuts to achieve actuarial balance (even ignoring the impact of individual accounts on financial balance).

### **Solutions: revenue increases**

In addition to cutting benefits, financing can be improved by increasing revenues. There are two available margins to increase revenues within the context of a standard payroll tax system. One is to increase the maximum earnings subject to tax, assuming that implied benefit increases cost less than the revenue gain, as would clearly be the case for the UK Basic State Pension and is the case in the US. And even some Republicans have called for increasing the maximum subject to tax. The second is to increase the payroll tax rate. The US payroll tax rate for pensions is low by international standards of advanced countries, so there is room to do so without imagining dire macroeconomic consequences.

### **The effect on aggregate and individual saving**

The institutional arrangement makes this a low-cost savings vehicle – perhaps at 30 b.p. As such the Government ought to compete in the market in the voluntary add-on accounts. However, the debate in the US centres on the impact on the fiscal balance and the extent to which national savings are thereby increased. There is a debate about the effect on national savings of the build-up of the Social Security trust fund, consciously included in the last major reform (in 1983) in anticipation of the baby boomers' retirements. Arguably, most of the surpluses have been saved by the Government and so have added to national savings. Others think that the Government has increased the deficit on the rest of the budget to offset the surpluses, and so little has been saved by the Government or contributed to national savings.

One argument that has not figured largely in the debate is that the proposed US reforms can be linked to stimulating greater individual saving. For example, the Bush administration proposal included no proposed facility for individuals to be able to 'top-up' their carve-out individual account with additional, voluntary savings. Analysts and members of Congress have proposed such a facility, which could be done with or without carve-out accounts. Furthermore, although low costs are a welcome feature of the carve-out accounts, this in itself is not something that would induce individuals

to save. 401(k)s already offer low-cost saving opportunities to many. It is worth noting that many people do not allocate savings to low-cost vehicles, also choosing – in some instances – to pay financial advisers 1% to invest in mutual funds on their behalf.

### **Concluding thoughts**

The role of government in the provision of retirement pensions should address both poverty among the elderly and inadequate replacement rates in a wider swath of the public. There should be concern about both replacement of earnings at retirement and replacement rates of benefits received by a couple when there is a death and a single survivor.

A replacement rate is the central concept for judging the adequacy of pensions for the population at large. While adjusting replacement rates for affordability is appropriate, using a price index rather than a wage index for the determination of initial retirement benefits does not adjust replacement rates for a cause that worsens affordability, but merely cuts replacement rates arbitrarily, and in a way not correlated with financial needs of the system. Consideration should be given to indexing for life expectancy, but with only a partial response by benefits.

In the US there is not an explicit process for getting to a bipartisan solution. With the Pensions Commission, the UK has a process which might succeed in generating cross-party consensus, as is needed for a pension system to have a stable structure that fits both social needs and affordability. One can only hope that the process succeeds.

# **Inequality and Social Exclusion**

# **Growing Earnings Inequality? A Simple Case of Supply and Demand?**

A B Atkinson

## **Summary**

Tony Atkinson's lecture emphasised six points in particular:

- earnings dispersion does not necessarily measure inequality;
- there are different episodes in UK/US history of earnings dispersion;
- a simple labour supply and demand story is helpful but incomplete for analysing income inequality;
- we should consider different types of model such as the sharing surplus model and the tipping model; and
- different explanations may be required for the top 1% of earners.

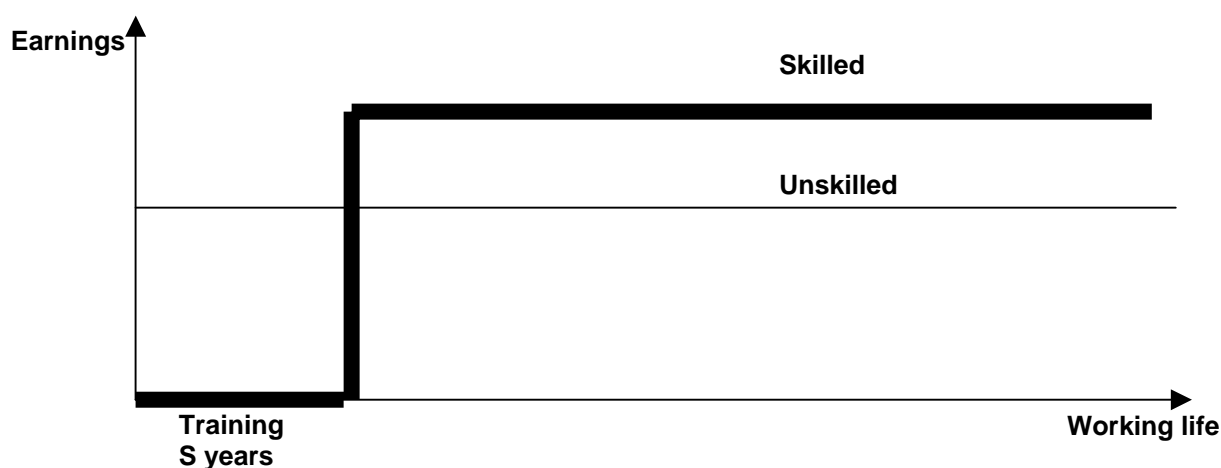
## **Introduction**

Labour market studies increasingly focus on social justice and equality. The following thoughts have emerged from a review and comment on the wealth of recent literature on earnings inequality, encompassing a bibliography of 544 texts. What follows will touch on the empirical evidence that generated this literature (particularly with regards to the USA), will set out the 'text book' explanation for the rise in earnings dispersion, highlight the problems with this explanation, then outline the need for a richer economic framework for understanding the phenomenon.

## **Compensating differences versus inequalities**

An apparently obvious point, often ignored, with regards to earnings dispersion is that a significant part of wage differences are equalising differences, which compensate for such variables as hours, conditions of work, danger, risk of losing one's job and the education or training undertaken and necessary to qualify for the job. That is to say, for instance, that higher earnings for skilled workers compensate for the period in which the skilled worker was training and not earning, whilst the unskilled worker was working and earning:

FIGURE 1: Lifetime earnings profile for skilled and unskilled individuals.



SOURCE: own diagram

For an infinite working life, the optimum  $S$  satisfies  $W_u e^{rS} = W_s$ , where  $W_u$  is the unskilled wage,  $W_s$  is the skilled wage and  $r$  is the discount rate.

Another example might be a professional footballer who would only expect high earnings for a few years. Existence of wage differentials should not necessarily, then, be considered as a sign of inequality. However, not all wage differences can be explained in this way, and certainly there is significant inequality, such as that caused by unequal access to education.

### Recent rise in dispersion in the USA

According to much of the US literature, wage inequality among US workers has grown significantly in the last few decades. Shi (2002) stated that in the USA the ratio of weekly wages between the 90<sup>th</sup> and 10<sup>th</sup> percentile of male workers increased from 3.29 in 1963 to 4.66 in 1995. It is important to recognise, however, that the last 25-30 years are differentiated with regards to patterns of wage dispersion in the USA, and that, relative to the median, earnings for the 1st and 9th deciles did not always move in opposite directions. US wage data suggests that there was not much change in the ratios between the top decile, the median, and the bottom decile during the 1970s. The 1980s were characterised by a rise in dispersion in earnings, as the bottom decile dropped from c.56% to c.48% of median income, while the top decile rose from c.200% to c.210% of the median. The bottom decile experienced a partial relative recovery during the 1990s while the top decile continued to rise. By 2001, the relative earnings of the bottom decile had regained its 1973 level. Commentators tend to ignore this recovery and instead focus on the continuing growth in the ratio between the top and bottom decile, arising from the increase in the relative earnings of the top decile.

## **Earnings distribution in UK and other OECD countries**

Patterns in earnings distribution are differentiated across countries as well as over time. Data on UK earnings from 1968 to 2003 provide a slightly different narrative to that of US wage dispersion. Unlike the USA, the UK experienced a comparatively steep rise in the income of the bottom decile relative to the median, and a slight fall in the relative income of the top decile during the 1970s. This was likely to be the consequence of the politico-economic circumstances and decisions of that decade – high inflation, an incomes policy limiting pay increases, and equal pay legislation. At the time, the fact that the relative earnings of the top 1% fell between 1954 and 1978 was attributed to the working classes getting educated, the privileged aristocracy losing their role and influence and the rise of Trade Union power.

During the 1980s, UK earnings distribution followed a similar, but less marked, pattern to that of the USA. In terms of earnings, the bottom decile went through a less severe fall in relative incomes than their US counterparts. (This was not, however, the case in terms of overall household income, where the bottom decile in the UK experienced a much sharper fall than the bottom decile in the USA.) As was the case in the USA, the bottom decile experienced a partial recovery in relative earnings during the 1990s.

The data on earnings dispersion in the UK since the 1970s that underlie these observations are based on all employees' earnings and since then there have been large compositional changes in employment with an increasing proportion of women employed and fewer men, in particular those with low skills: this compositional change may partly explain the increase in the dispersion of earnings;

Data on France's earnings distribution between 1973 and 1998 present a very different picture to that of the UK and USA. The 1970s witnessed a slight narrowing of the gap between the top and bottom deciles; the 1980s saw a continued narrowing followed by a slight expansion; and the 1990s experienced a further slight narrowing in earnings distribution.

Although the USA story was broadly repeated in a number of OECD countries, not all followed the same pattern. OECD earnings data comparing the 90<sup>th</sup>/10<sup>th</sup> percentile ratios between 1984 and 1994 reveal that there was little change in earnings dispersion in Japan, Finland, Netherlands, France, Norway and Denmark for this period, while the USA, UK and New Zealand underwent comparatively marked increases in earnings ratios.

When accounting for patterns in earnings dispersion, therefore, one must explain the differences between countries as well as different trends at different times.

## **Supply and demand for skill: the textbook story**

The extreme right-wing, libertarian view claims that individuals with exceptional skills are entitled to very high earnings because the skills are these individuals' characteristics. This amounts to a right-wing labour theory of value. Another way of looking at the same phenomenon is to see the skills as generating rents for the individuals which should be taxed because taxing them is unlikely to be distortionary and will be progressive.

The standard 'text book' explanation for widening earnings dispersion focuses on the increase in the relative demand for skilled labour (e.g. Olivier Blanchard's macroeconomics text book and see Steve Nickell's lecture). Relative supply of skilled labour has not kept pace with increased relative demand, resulting in a shift in the demand curve and an increase in the relative wage for skilled workers. Jan Tinbergen, using an underlying Cobb-Douglas (C-D) production function developed the notion of a race between shifting demand (i.e. technological progress) and shifting supply (i.e. education). A constant elasticity of substitution (CES) production is more useful for examining substitutability, (the C-D has this elasticity equal to 1). It is important to recognise that in the case of this skills and technological change explanation, any general increase in productivity or general progress in technology will not impact on relative wages. For a shift in the distribution of relative wages, technological change must affect one type of labour more than another.

There are two interpretations of the skills bias in changes to earnings dispersion in the last 25-30 years. The first is that the technological change undergone in that period is biased towards skilled labour as it has increased the relative marginal product of skilled labour. The second explanation argues that technological change has essentially augmented skilled labour – in that sense, made it relatively more productive. Provided that the elasticity of substitution between unskilled and skilled labour is greater than 1 this would increase the relative earnings of skilled workers. Technological progress does not necessarily take this form – for example, skilled labour may be displaced as with hand crafts during the industrial revolution.

## **Problems with the textbook story**

There are four problems with the textbook explanation. First, with its focus on the labour market and neglect of the capital market, the 'textbook' story should be considered as only a partial explanation of the pattern of wage dispersion. One needs to consider whether skilled labour and capital are complementary or whether they are substitutes.

Second one needs to take into account that real rates of interest are much higher today than they were in the 1970s. In order to achieve a full explanation of changes in earnings distribution, it is important not to overlook the fact that the capital market is having an impact on differentials through changing the costs of skill acquisition through education or training.

Third, the emphasis on the importance of technological change (which favours skilled workers) in the textbook story is sometimes contrary to the empirical evidence. There is a problem of timing. The widening of the gap in earnings in the USA began and, was at its most acute, in the early 1980s, whereas the significant ICT impact on productivity at the aggregate level occurred after this rise in earnings inequality.

Fourth, the textbook explanation relies too heavily on a mechanistic application of supply and demand laws without reference to the institutions and policy interventions – such as employers' organisations, Trade Unions, collective bargaining, the Minimum Wage and Jobcentres - operating in the real world. For a better understanding of changes in wage dispersion, one needs to develop a richer economic framework of analysis.

### **Towards a richer economic framework**

Our understanding of patterns of earnings distribution would be enriched by the notion (increasingly recognised in the macroeconomic literature on the labour market) that, while the laws of supply and demand set limits in the labour market, in an equilibrium with transactions and search costs there would be a surplus between the worker and the employer. This surplus is shared between the worker and the employer through bargaining. The wage differential will be related to productivity benefits, any outside option of not working (e.g. unemployment benefit), and the relative bargaining power of the worker and the employer; without the outside option the differential would be based only on relative productivity. As the outside option deteriorated in 1980, the wage differential widened. Moreover, collective bargaining, which previously resulted in some wage redistribution, declined in the 1980s. As the power of the Trade Unions lessened and local, individual bargaining increased, wage differentials widened.

A further notion, which can enrich our understanding of wage differentials, is that of multiple equilibria (also popular in macroeconomics). The patterns we see may not be trends, but transitions between different equilibria. Multiple equilibria can arise when there is a relationship of inter-dependence between employers and workers that is influenced by each side's social reputations. Both employers and workers can recognise the need to conform to a pay norm as the former know that they will not find workers and latter that they will not find employers if they do not. Or both may reject pay norms. There may be a tipping effect (an effect often associated with Thomas Schelling) around an unstable position. Where some endorse the norms and others do not, wage differentials could change quickly before settling on a new pay norm which remains stable for a period, either with everyone endorsing the norms or no-one endorsing them. A norm can be altered, for example by a change in labour market institutions and this could lead to large changes in pay and conditions not just in the marginal job but in most jobs.

### **The top 1% and trade**

In the UK the top 1% of earners experienced a decline in relative wages between 1954 and 1978 (use of Inland Revenue data allows the series to go back before the New Earnings Survey). For this top group, the textbook skills and technology argument does appear to retain considerable relevance. S. Rosen, in “The Economics of Superstars” in a 1981 volume of the *American Economic Review* argued that technology increases the range of skills and talents for the top 1%. At the same time, the increase in trade has enabled global superstars in the top 1% category to charge higher rent for their services. To illustrate the impact of enlargement in trade and improvements in communications technology, Rosen used the example of Mrs Billington, a soprano who earned in excess of £10,000 in 1801. This relative wage must, he argued, have paled in comparison to that of Pavarotti in the modern era, who benefited from the impact of radio, television and trade.

# **A More Equal Society? Poverty, Inequality and Exclusion**

John Hills

## **Summary**

John Hills reported findings from a study which surveyed the evidence on the impact of those Government policies since 1997 that aimed to address poverty, inequality and social exclusion. He began by citing Peter Mandelson in 1997:

“The doubters [should] judge us after ten years in office. For one of the fruits of that success will be that Britain has become a more equal society.”

The areas he considered included labour markets, education, health, poor neighbourhoods, and early years provision. He also explicitly considered policies and outcomes for children, pensioners and ethnic minorities. He concluded by comparing the record of the current administration to previous Labour and Conservative governments.

## **Labour markets**

Progress in unemployment in recent years is an extremely good news story. We have the lowest unemployment for thirty years. Even long-term unemployment has fallen considerably since 1997, although the trend is now flattening out. However, the unemployment rate for 16-17 year olds is broadly the same as it was in 1997, and the initial impact of the New Deal has slowed.

Furthermore, progress on unemployment has not been matched by a similar fall in inactivity: The male inactivity rate has risen since 1997 as the corresponding unemployment rate has fallen. In European terms, the proportion of jobless households in the UK is still high.

## **Education**

There has been a narrowing of the gap between children from poor backgrounds and the rest in terms of the proportion achieving the “expected” level at age 11, although the narrowing can partially be attributed to a ceiling effect: the proportion of children from well-off backgrounds achieving the expected level is so high that there is limited scope for it to rise further. Overall, the social class gap in educational attainment remains very wide, and it may even be widening in post-compulsory education.

## **Health**

The current administration has acknowledged health inequalities as an important area of policy, and that it has important links with other areas of

policy. Policy-makers weren't even allowed to talk about health inequalities until 1997; they had to talk about health *variations*. However, no specific policies were announced until the 2001 general election and targets were not particularly ambitious.

Furthermore, the main thrust of general health policies could unintentionally lead to further increases in health inequalities. Indeed, in both education and health, there is a tension because policies that are best at raising standards for all (arguably the tenet of New Labour's 'progressive universalism') also tend to be the ones that perpetuate gaps. All we can really say about health inequalities is that there is no real evidence yet that current policies will close gaps, nor that that gaps are closing.

There are three different criteria for judging inequality: absolute levels at the bottom, absolute gaps between rich and poor, and proportional gaps between rich and poor. It is not obvious which is the more compelling indicator and they often move in different directions. In the case of education, the targets focus on 5 A\*-C grades, instead of a point score aggregate, may have caused schools to neglect the lowest achievers. In health the better off may have taken more advantage of improving levels of advice and care than those with lower incomes.

### **Political participation**

Formal participation continues to decline, although postal voting in some areas has had some impact. There is positive evidence on the 'quality' of informal involvement rather than numbers involved. Tellingly, more than half of the low income families in the Centre for the Analysis of Social Exclusion's (CASE) qualitative longitudinal study feel that they have no influence at all over decisions that affect their lives. Policy, however vigorous and well-intentioned, has not filtered down to ground-level perceptions.

### **Poor neighbourhoods**

The Government has set a target of people not being seriously disadvantaged by where they live within 20 years (now 18). This is the Government's single most ambitious target. In terms of making progress on neighbourhood deprivation, there has been some overall progress when all disadvantaged Local Authorities are lumped together.

However, not all neighbourhoods are improving, and progress has not been uniform across all dimensions. The proportion achieving five good GCSEs at some under-performing secondary schools has increased massively since 1997 whilst other schools have improved very little, although the trend in attainment when comparing Local Education Authorities (LEAs) appears more uniform. Teenage conception rates have fallen in some of the areas considered (most strikingly in Nottingham), but in several of CASE's sample of twelve disadvantaged areas there has been little or no progress.

As an aside, it is to be hoped that the Social Exclusion Unit's (SEU) relocation to ODPM from the Cabinet Office does not signify a decision that social exclusion is now seen as a corollary of area disadvantage. Multiple disadvantaged people should remain the concern of the SEU, wherever they live.

### **Childcare and early years education**

This moved up the agenda in recent Spending Reviews, with targets for childcare provision and nursery education participation and a large increase in overall resources. There has been an increase in 3 and 4 year old participation in education and more childcare, but short of target. Sure Start has proven popular on the ground but has produced only mixed results against its ambitious targets. Overall, spending and childcare provision is still low in European terms, and quality of childcare remains an issue.

### **Older people**

There has been a shift in care towards higher intensity and private provision. More people are working after 50 and there is increased means testing of services, which, although it targets resources on the poorest, brings administrative complexity and sometimes social stigma. There are concerns that people with middle-intensity care needs will suffer.

### **Ethnic inequalities**

These have not been a specific substantial focus of Government policy, with the focus instead being on the issue of overall disadvantage. In theory, focusing on disadvantage should benefit ethnic minorities. In practice, despite improvements for most groups, ethnic inequalities remain very large in many dimensions. Area segregation remains a major issue and, in some areas, school segregation is a very big issue indeed. The government has also deliberately reduced rights for asylum seekers, despite the fact that many go on to become (disadvantaged) British citizens. Although this is a political decision with which many of the population might agree, such policies and those towards 'non-favoured' groups (such as jobless working age adults without children), have contrasted strikingly with those towards more favoured groups. So in a sense Government inclusion policy has its exclusions.

### **Child poverty**

Poverty was only mentioned twice in the 1997 manifesto. But, in 1999, the Prime Minister pledged to eradicate child poverty within a generation. This was followed up with concrete interim targets. One of the most stunning

statistics around at the moment shows that the proportion of lone parents who 'never have money left over' has fallen from 48% in 1999 to 17% in 2002.

Over an extra one percentage point of GDP is now going towards children (not including education spending). This has attracted international attention: US academics are now drawing on the UK example to argue for a similar shift there.

### **Working-age poverty**

The policy focus is on worklessness, not poverty in itself. As such, policies are aimed at employment and incomes in work; in contrast to the UK, the Irish government has an *overall* poverty reduction target. There has been a slight fall in relative poverty for the overall working age population, but an increase for those without children. Many remain dependent on price-linked benefits and are increasingly left behind as incomes rise.

### **Pensioner poverty**

The Chancellor has promised to end pensioner poverty, but with no deadline attached. However, there has been an increase and extension of the means-tested minimum through the Pension Credit, and relative poverty fell by 2002-03 with further falls likely by 2004-05.

### **Income inequality**

Reducing overall income inequality has never been an objective of New Labour; the Prime Minister has said that it is no aim of his to 'make sure that David Beckham earns less money'. The Government has instead concentrated on narrowing the gap between the bottom and the middle of the income distribution. As incomes at the very top continue to rise fastest, the gap between the very bottom and the very top has increased, although that between those near the bottom and those near the top has narrowed.

### **Comparing the Wilson, Thatcher, Major and Blair years**

Judgements of these eras have been based on the expectations of commentators, themselves fundamentally informed by the growth rates of GDP. Annual GDP growth rates were the same (2.4%) in 1963-70 as in 1996-03, but relative poverty fell to a greater extent in the first period. Real income growth under Thatcher rewarded people progressively more according to how high up the income scale they were; the Major years saw some reversal, but slow growth for all income groups; Blair's tenure has seen roughly equal increments for all throughout the income scale, and so little change in inequality, but crucially there has been the first sustained real income growth for the poorest since the early 1970s.

This possibly unfavourable comparison of the Blair and Wilson years – namely that despite identical GDP growth, inequality under Blair (measured by the Gini coefficient) had increased slightly while absolute poverty had dropped less compellingly – could be qualified by putting them in historical context. Given the levels of child poverty in the 1990s, current levels are a huge achievement. Wilson's government started from a position of greater equality and so could be argued to have faced a lesser challenge, although one could equally argue that it is hard to make progress against the most deep-seated problems.

The issue of income inequality is not just a political judgement but one concerning the appropriate distribution of resources within an economy. Tony Atkinson's work [see the next section] has shown the greatest income gains went to the highest earners over the past 25 years. Is that the best distribution of resources for the economy? The experience of other countries shows that creeping inequality is not unstoppable. Labour has merely halted the march of inequality begun in the 1980s.

## **Conclusions**

Ambitious targets for child poverty and area disadvantage are the keystone of Labour's social policy. Where initiatives have been taken, progress has been made, but gaps remain, for example for the working age poor without children.

## ***Next steps***

It would be wrong to see a diminishing marginal utility of Government intervention. As progress is made, success becomes tougher and some policies need to be rejuvenated – for example, on the employment agenda. Having 'mopped up' the easier cases, the pressing issue now is how to reach the harder-to-reach groups. The bottom half of poor children will be harder to raise out of poverty than the top half.

There may be limits to the continued piling on of means-tested benefits: if further extended, in order to avoid an unacceptably large increase in effective marginal tax rates, benefit tapers may have to be extended, but that would widen the number of people affected. Other issues still to be addressed include: can benefits be indefinitely price-linked given that poverty is a moving target?; working age economic inactivity; the rejuvenation of the New Deals; and the most disadvantaged minority ethnic groups; inequality at the top of the income distribution.

# How is the UK Labour Market Changing?

Steve Nickell

## Summary

Steve Nickell covered the nature and reasons for the improvement in the UK labour market. He outlined the areas of poor performance that exist beneath the surface of an apparently strong performance. These problematic areas include male inactivity, low skill levels and poverty.

## The Success of the UK Labour Market

The macroeconomic performance of the UK labour market has been good over the last decade. At 4.8% in the quarter to May 2004, the ILO unemployment rate has fallen to levels not seen since the 1970s. In addition, the stable macroeconomic framework over the last decade has provided stable, low inflation rates. This is in stark contrast to the conditions experienced in the 1970s and 1980s. There has been no change in real wage growth relative to the Retail Price Index.

This pattern of success is similar to other European countries with successful labour markets such as Denmark, Ireland and the Netherlands whose weighted average of ILO unemployment in 2000-01 was 3.8%. The UK's ILO unemployment rate during the same period was 5.3%. This is better than the performance of other large European nations such as France, Germany, Italy and Spain whose weighted average of ILO unemployment in 2000-01 is 8.9%.

There are three main reasons for this labour market improvement:

1. The rapid decline in adversarial trade unionism in the private sector. Less than twenty percent of private sector employees are now unionised. New establishments are far less likely to be unionised than those set up prior to 1980. This reflects a change in both legislation and industry structure.
2. There has been a gradual increase in the efficiency and strictness of the public employment service and benefit system. This trend is continuing with Jobcentre Plus.
3. There have been other changes with more minor effects, both positive and negative. These include: changes in taxation; the introduction of the minimum wage; changing labour costs; the New Deals; and tougher competition rules.

## **Problems in the UK Labour Market**

Underlying this labour market success are three less positive trends:

1. The rise in inactivity amongst men;
2. Weaknesses in skills and education; and
3. High levels of poverty.

### **The rise in inactivity among men**

Inactivity amongst men of working age has increased by a factor of between three and five since the 1970s. These men are not in work, nor are they looking for work. In contrast, the unemployment rate and the female inactivity rate are virtually the same as those in the 1970s. Overall, working age inactivity stood at 21.4% in the quarter to May 2004, representing 21.4% of the working age population.

(The rise in employment amongst women has been good for gender equality but has been concentrated in households where a partner is already working. This has led to a labour market where work has become polarised between 'work-rich' and 'work-poor' households).

Much of the increase of those on inactive benefits has occurred amongst the low skilled, or those affected by chronic illness or disability. There is a strong correlation between ill health, low educational standards and inactivity. Those men in the bottom skill quartile are between three and four times more likely to be inactive as the rest of the working age population. Twenty percent of those without any qualifications are now inactive because of ill health reasons. A third of men with long-standing illnesses were no longer in contact with the labour market. Set against this, the tightening of the disability benefit system in 1995 and the gradual widening of the New Deal for Disabled People has produced a slowdown in the increase of the numbers on inactive benefits.

One of the main reasons for the rise of inactivity among men has been the substantial fall in demand for unskilled workers relative to skilled workers that started in the early 1980s. This shift in demand has weakened the unskilled labour market, reducing relative wages and increasing worklessness. The impact has been greater in the UK because of the large number of very low skilled workers in the UK labour force. This has been a worldwide phenomenon that has particularly affected the OECD countries.

### **Weaknesses in Skills and Education**

The second weakness affecting labour market performance is the poor level of skills and education in the UK labour market. Research into adult literacy

and numeracy levels has consistently found the UK to be one of the worst performers in the Western world.

Moreover, literacy levels are not improving over time. In the UK all age bands in the prime working age range exhibit the same results with between 17-18% of this group at level one in prose literacy. The results in quantitative literacy are worse with the proportion of those at level one standard in the 16-25 year old bracket rising to 22%. Historically things were no better. International mathematics tests on English pupils in grammar schools during 1963-4 revealed that 24% of English pupils had scored less than 5 marks out of 70. Taken together these results are significant because they demonstrate that the UK is suffering a 'long tail' skills problem. This leads to low earnings as there is a very high correlation between skill levels and earnings. This in turn increases worklessness that exacerbates poverty.

The long-term strategy to improve these difficulties involves raising the human capital of those in the bottom half of the ability range. This would not mean that the same range of jobs would be available to an increasingly more highly educated work force. The number of low paid, low skill jobs reflects the dynamics of the labour market. As the education and skills of the labour market increase so the number of lesser quality jobs would decrease and the poor quality employment opportunities would become less 'bad'.

There are still areas in the country where there are large numbers of jobs vacant and large numbers of people not working. However, many of the vacancies that remained in the UK economy are low paid, unskilled jobs (e.g. in food processing) that are unlikely to be filled by UK citizens.

## **Solutions**

There are three ways in which the human capital of the bottom half of the ability range could be raised in the long term. These are:

1. Raising resources for 'poor' schools and increasing incentives to teach in 'poor' schools where a high percentage of pupils are deemed to be in poverty;
2. Raising resources for quality childcare and early childhood interventions targeted at the most disadvantaged children; and
3. Raising resources for after-school and mentoring programmes targeted on the most disadvantaged children.

Money spent by Western Governments on skills training had not, on the whole, been very effective. However, the initial results from in-work training, such as that being developed by the Department for Education and Skills, were encouraging.

In the short term there are three ways labour market problems could be addressed:

1. Introducing a minimum wage and fair wage legislation. However, this is not a very well targeted solution. A perverse outcome of this measure might be to raise worklessness amongst the low skilled;
2. Reducing barriers to work, particularly part-time work, by providing a professional employment service; and
3. Introducing welfare to work, activation schemes and in-work benefits. Experiences in Denmark and the Netherlands have indicated that these active labour market policies could raise employment rates while still retaining a generous welfare system. The UK is seen as having a highly developed welfare to work system. In-work benefits are also effective at reducing poverty without causing adverse employment effects. Early retirement incentives should be eliminated as far as possible.

## **Conclusions**

Of course, improving labour market outcomes, and the factors that drive them, has wider social benefits: improving outcomes amongst the sick and disabled would help to improve the health of those who returned to work while basic levels of literacy and numeracy are desirable for citizenship as well as a better functioning labour market.

In the future, there are still questions that remain unanswered for policy-makers in this area. Who should be entitled to benefit without having to search for work? Traditionally, the old, sick and disabled have been exempt but for how long will this continue? There is also a question of measurement. How old, sick or disabled does a person need to be in order to gain exemption from their responsibilities in relation to the labour market? Rights and responsibilities differ for each client group between Western nations and rules are evolving over time.

# **Applications of Microeconomics to Public Policy**

# Economics and Public Policy: A critique of the market failure doctrine

John Kay

## Summary

Robert Frost's poem 'The Road Not Taken', describes a man in a position of uncertainty, unsure of which road to take. We face such dilemmas throughout our lives when we must- make choices in the possession of imperfect information and when the problems we face are uncertain and 'incompletely specified.' John Kay explained how his growing recognition of the proliferation of these problems in economic decision-making has led him to have increasing doubts over recent years about the explanatory and predictive power of the 'market failure doctrine' coined in the 1950s and subscribed to by most economists today.

## The market failure doctrine

This doctrine, which is implicitly reflected in many government policy documents as well as academic journals, presumes that markets are always efficient unless there is the presence of monopoly, externalities and public goods, or (a more recent addition to the list) information asymmetries. And even where these 'market failures' do arise, the presumption is that government intervention is not appropriate unless the benefits of remedying the consequences of market failure outweigh the costs of intervention.

This market failure doctrine should be more accurately described as 'model failure,' since it is believed that a model's explanatory and predictive power is weakened by a number of underlying assumptions that may not hold in many real world scenarios. The potentially false assumptions include:

- **There are well-defined, enforceable, property rights**– in practice these are often socially constructed and observed;
- **Initial allocations are known, and efficient reallocations can be achieved through costless transfers**– in reality allocations may be unknown or grossly unequal, and lump sum taxes to redistribute are costly and create distortions;
- **Outcomes are the only states valued**– in practice, people also place value on fair and transparent processes (i.e. the means does not always justify the ends);
- **Contracts can be perfectly specified, monitored and enforced**– in the real world this is almost always impossible; and

- **Individuals and societies have consistent underlying preference orderings**– experience and observation suggests this may not be the case for a variety of legitimate reasons that economists do not recognise.

### New ‘model failures’

Recognising these underlying assumptions of the prevailing economic model produces a whole new set of potential ‘model failures’ that complement the traditional list. There are several typical policy areas where these model failures are likely to arise; these do and will pose problems for economists and policy-makers:

TABLE1: New ‘model failures’

| Policy issue                  | Model failure(s)?   |
|-------------------------------|---|
| Health funding mechanisms     | Process issues and indeterminate initial allocations                |
| University tuition fees       | Time preference inconsistency and indeterminate initial allocations |
| Overseas aid mechanisms       | Initial allocations and implicit contracts                          |
| Pension provision             | Time preference inconsistency                                       |
| Equitable Life                | Implicit contracts  |
| Railtrack                     | Implicit contracts  |
| Split level investment trusts | Preference inconsistency  |
| Microsoft anti-trust case     | Socially determined property rights                                 |

We will explore one of these potential model failures – preference inconsistency, and show how it a) is a very common phenomena, and b) can be appropriate behaviour in a complex and uncertain world. Traditional economic theory assumes that ‘rational economic men’ exhibit three main types of consistent preferences, and implicitly mocks people who do not exhibit them in practice:

- **Time consistency**– preferences will remain constant and coherent over time;
- **Consistent personal probabilities**– people will make choices based on the balance of probability, drawn from their experience of likely outcomes (Bayesian expectations); and
- **Independence of irrelevant alternatives**– preferences should not be changed by the addition of non-favoured alternatives, or changes in the context of decisions.

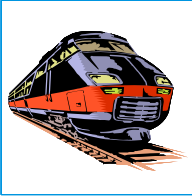

However, it may be entirely reasonable to violate these laws of consistency in the real world, where:

- **The context and timing of decisions does matter**– for instance, the consequences of a decision for our welfare may vary considerably over time and in different circumstances;
- **We have to make decisions that we can act on**– for example, making a probable, but vague, assumption about a person's character and occupation may be consistent with Bayesian expectations, but wouldn't give us enough information to act and initiate a conversation with them on.
- **The choice facing us is unfamiliar**– we may make inconsistent choices in hypothetical scenarios and artificial tests where there are few parallels to past experiences. In the Wason Test illustrated below, for example, the two problems are identical, but it is easier to deduce the correct answer (3 & 4) in the second problem, since it is a more familiar scenario; and/or
- **Additional non-favoured alternatives may be highly relevant to our decision**– additional consumption options offered to us by a friend or retailer may reveal more information to us about his or her character that changes our preference between the previous alternatives. While we might prefer an extra coffee to leaving a friend's dinner party early, our preference between the two could be turned on its head if taking cocaine was offered as a third alternative.

FIGURE 1: The Wason Test

**The Wason Test**

**Problem 1:** All cards with animals on the front have an even number on the back. Which cards must you turn over to ensure this rule is satisfied?

|   |   |   |   |
|---|---|---|---|
|  | 2 | 3 |  |
|---|---|---|---|

**Problem 2:** No one under 18 is allowed to drink alcohol. On entering the pub, you see

1. an old age pensioner
2. someone drinking a coke
3. a young person
4. someone drinking beer

What checks do you need to make to ensure the law is being observed?

Moreover, the experience of highly successful entrepreneurs suggests that, while basing behaviour on Bayesian expectations of probable outcomes may be rational in one sense, it is not necessarily the best way to achieve very large returns. Investing in low probability/high return outcomes may be (to ambitious, optimistic, risk-loving people) a more logical course of action. This explains why so many successful businessmen and entrepreneurs are seen in expensive London casinos – they are psychologically disposed towards high risk/high return scenarios, and have gained much of their wealth through successfully ‘gambling’ on improbable outcomes using speculative investments.

Widespread preference inconsistency, and the proliferation of other market failures in the real world, pose a dilemma for economists. By making unreasonable assumptions about behaviour, information and other salient issues, the explanatory power and utility of the traditional economic model is reduced. The model is far from useless, however, and economic principles can and should make a vital contribution to policy making, alongside other disciplines. The challenge is to reflect more accurately the complexity of the real world in our economic models, and not to try to change the world to fit our model.

# Happiness

Richard Layard

## Summary

Richard Layard argued that given that recent research has shown that some of the significant determinants of happiness are 'things that money can't buy', economic policy should be re-orientated to see raising overall happiness, rather than GDP growth, as its overriding objective. This would have implications for the tax and benefit system, public expenditure, labour market behaviour and macroeconomic policy.

## The historical dilemma

Political economists in the eighteenth and nineteenth century (of whom JS Mill and Jeremy Bentham are among the best known) sought to discern an economic and political order that would deliver a happy society. They believed that individuals' happiness, or 'utility', was an objective, measurable attribute, and that overall social welfare was a function of all citizen's utility. Personal income was regarded as a significant, but not the sole source of this utility.

At the beginning of the twentieth century, however, psychologists raised doubts about the ability to understand or measure the nature of personal happiness, and the utilitarian approach to economics and public policy consequently lost popularity. As a consequence, economic theory developed in such a way that knowledge of individual's relative preferences was the only information about their psychological state deemed necessary.

Simultaneously, income became the new, more limited, proxy for welfare, and its growth became the implicit goal of public policy.

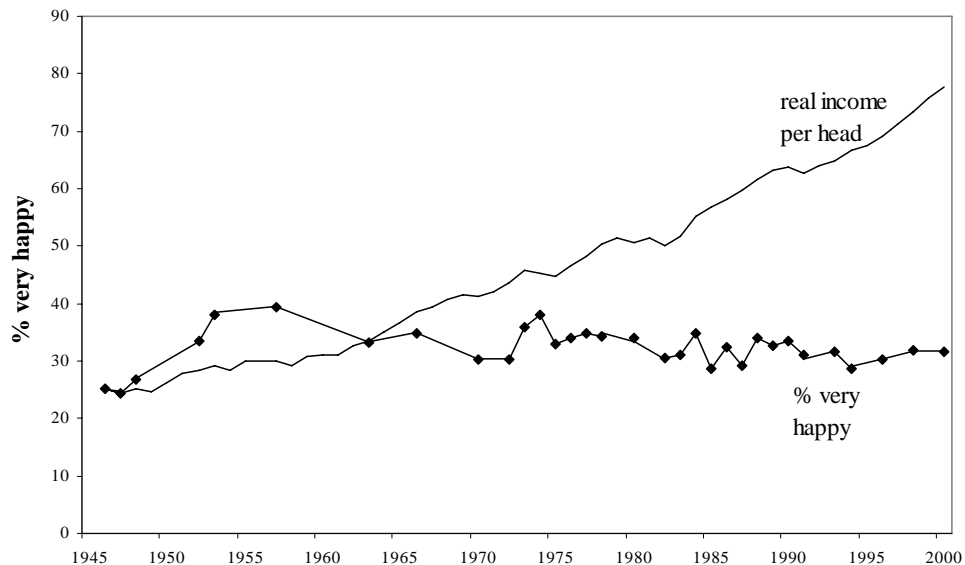
In recent years, however, advances in psychology and neuroscience have increased our knowledge of what makes people happy, and increased our ability to measure personal happiness in a consistent and objective way. But it is now argued that most economists and policy-makers have not caught up with these developments, continuing to define social welfare in terms of GDP and retaining an excessively narrow vision of individuals' sources of utility.

## New insights on happiness

Advances in survey techniques towards the end of the twentieth century have made the concept of objective, cardinal assessments of individual and social happiness regain credibility amongst psychologists – even though this development has been unseen by economists. Moreover, recent progress in neuroscience now means that it is possible to detect the electrical activity that takes place in the brain when a person experiences feelings of happiness.

The latest statistics – both cross-sectional and time series data - indicate that, once a ‘First World’ level of income is achieved, levels of happiness do not increase as GDP per capita grows further (see Figure 1 below). So while people in the world’s developed countries are on average happier than those in developing countries, they are not getting happier as their incomes continue to rise. Indeed, the incidence of depression is becoming no less common in the wealthiest societies, and there is a widespread sense that ‘something is missing’ in modern materialist Western society.

**FIGURE 1:** Income and happiness in the United States



**SOURCE:** Layard, R. (2005), “Happiness- Lessons from a New Science”, Penguin, p30.

This perception is supported by research on the determinants of happiness, which has found that people gain significant happiness from a number of ‘things that money can’t buy’ for example:

- autonomy and personal liberty;
- a stable marriage and family life;
- strong friendships and participation in community life;
- meaningful employment;
- religious faith; and
- good health (both physical and mental).

Economic policy should be re-orientated in the light of these new insights to see raising overall happiness, rather than GDP growth, as its overriding objective. This would have implications for the tax and benefit system, public expenditure, labour market behaviour and macroeconomic policy.

### **A new objective for economic policy**

Since income does remain - at the individual level - positively correlated with happiness, why should GDP growth not remain the overarching priority for

economic policy? The reason is the evidence cited above, which shows that as developed societies get richer, feelings of well-being increase only marginally, if at all. There are three contemporary psychological insights that explain this phenomenon:

### **Social comparisons**

Individuals compare themselves to their peers when judging their well-being. Our neighbours' income will therefore have a bearing on our personal happiness.

Survey evidence from the developed world (e.g. the Eurobarometer Survey on European Attitudes and the US General Social Survey) has shown that as other people's incomes rise, this has a negative impact on our own utility, and partly offsets the beneficial utility gained from an equivalent increase in one's own income. The unhappiness created in others by one person's increased income could be defined as a 'negative externality'. This insight can justify taxing people on efficiency grounds to discourage the pursuit of higher relative income, which is a zero sum game.

People would be better off as a result of this income tax, as its substitution effect will encourage them to spend less time at work, undertaking 'happier' activities at the margin.

### **Adaptation**

People get used to a given standard of living, so improvements in income have only a temporary effect on happiness. Survey evidence on people's self-assessment of a 'satisfactory income' show that this rises as their actual income rises. This indicates that income is a form of 'addiction,' with yet greater quantities required to satisfy as personal consumption increases. This provided further justification for income taxes - to discourage unforeseen addiction to higher incomes that won't make people any happier.

Related to the issue of adaptation, psychological surveys reveal a high degree of risk aversion amongst the populace at large, with people willing to take on a hypothetical personal financial gamble only in exchange for a very large payout in the best-case scenario. This evidence has important implications for macroeconomic policy – achieving macroeconomic stability that delivers less variability in income and employment should have a large beneficial effect in reducing personal financial risk and thereby increasing happiness.

Jeopardising macroeconomic stability in the pursuit of slightly higher GDP growth would consequently be unwise.

### **Preferences**

Economists usually assume that individuals' preferences are 'given,' and cannot be changed. But in reality we know this to be false – hence the large

amount of money spent on advertising by companies trying to shape consumer tastes.

Moreover, if individuals' tastes can change, and are successfully made more 'expensive' over time by advertisers, then they will be progressively more unhappy unless their income rises to compensate. In short, watching TV adverts makes you feel poorer, and thus less happy. Education is also a key mechanism for forming and changing tastes. With this in mind, teaching methods that encourage competition between pupils should be carefully considered, since they create stress and unhappiness that may not be adequately outweighed by the higher educational attainment (and future earnings) that they can stimulate.

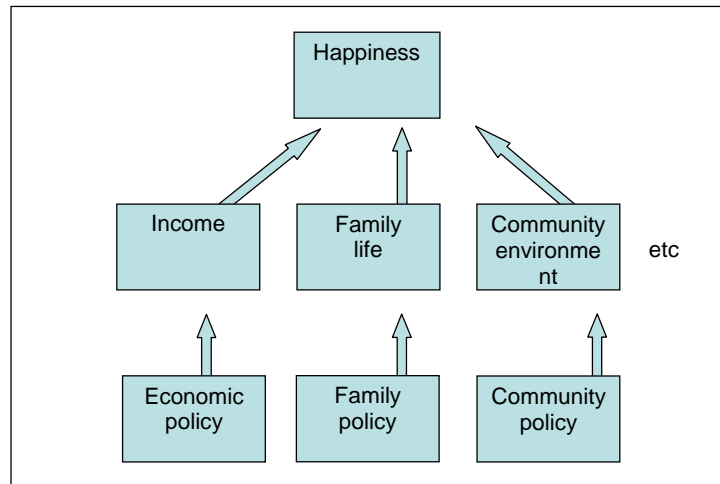
Motivations, as well as tastes, can change. For instance, one risk with high-powered financial incentives for employees is that they can drive out internal, intrinsic motivations for effort at a task. In short, if someone pays you handsomely for doing something, you may cease to feel that you ought to do it anyway. One example of this is the Israeli childcare centre – that, to encourage people to pick up their children on time, fined parents who were late. The result was that more people were late – they felt it was alright to be late since they now paid for it.

Similarly, while the introduction of performance related pay (PRP) may lead to higher output from a firm, it can create additional stress and competition amongst employees. In terms of maximising social well-being, PRP could only be justified where it brings large unambiguous gains for shareholders and customers that outweigh the loss of utility among employees. And firms can remain competitive in this environment *if* their staff are willing to trade-off a lower wage in favour of a less stressful, happier working environment.

## **Conclusion**

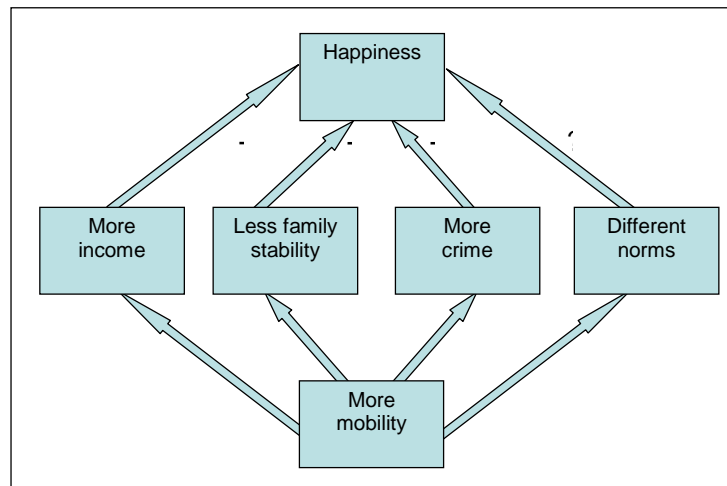
It is imperative that economic policy objectives are realigned to place happiness as their overall goal. A singular focus on maximising income growth ignores other determinants of happiness, and overlooks the impact that higher incomes, and the instruments used to get there, may have on social well-being. For example, policies intended to raise personal mobility might facilitate faster growth, but could jeopardise family life, social cohesion and other important determinants of happiness (see Figures 2 and 3 below).

**FIGURE 2:** The policy maker's ideal world



**SOURCE:** Layard (2005; p146)

**FIGURE 3:** Reality



**SOURCE:** Layard (2005; p146)

## **Biographical Notes**

**Sir Tony Atkinson**, FBA is a former Warden of Nuffield College, Oxford where he is now a Senior Research Fellow. He has been Professor of Economics at the University of Essex, Visiting Professor of Economics at MIT, Professor of Political Economy at University College, London, Tooke Professor of Economic Science and Statistics at the London School of Economics, and Professor of Political Economy at the University of Cambridge. His work has focused on public economics in particular, and he is currently examining income distribution and poverty.

**Richard Blundell**, CBE, FBA holds the David Ricardo Chair of Political Economy at University College London and Research Director of the Institute for Fiscal Studies. He is President of the Econometric Society and Director, ESRC Centre for the Microeconomic Analysis of Public Policy. His research interests include microeconometrics, savings and consumption, household behaviour and public economics.

**Peter Diamond** is an Institute Professor and Professor of Economics, MIT. He has been president of the American Economic Association, the Econometric Society and the National Academy of Social Insurance. His books include "Social Security Reform" and "Saving Social Security: A Balanced Approach". His research interests include social insurance, taxation, and the interface between psychology and economics.

**John Hills** is Professor of Social Policy and Director of the ESRC Centre for Analysis of Social Exclusion at the London School of Economics. He became a member of the Pensions Commission in January 2003. His research interests include income distribution and the welfare state, social security, housing and taxation.

**John Kay**, FBA is a Fellow of St John's College, Oxford and a Visiting Professor of Economics at the London School of Economics. He has been Professor of Economics at the London Business School and Professor of Management at the University of Oxford. He has been Director of the IFS and set up the economic consultancy London Economics. He writes a regular column for the *Financial Times*. "The Truth about Markets" was published in 2003. His interests focus on the relationships between economics and business.

**Paul Klemperer**, FBA is Edgeworth Professor of Economics at Oxford University and a Fellow of Nuffield College. He is a Member of the Competition Commission. He was the principal auction theorist for the UK's auction of mobile phone licenses which raised £22.5 billion for the Exchequer in 2000. "Auctions: Theory and Practice" was published in 2004 and can be found at [www.paulklemperer.org](http://www.paulklemperer.org). His research interests include the theory and policy of industrial economics, competition policy and microeconomic theory (especially auction theory).

**Lord Richard Layard**, FBA was founder-director of the Centre for Economic Performance at the LSE where he is an Emeritus Professor in Economics. Since 2000 he has been a member of the House of Lords. He was an early advocate of the welfare-to-work approach to unemployment, and from 1997-2001 he helped implement these policies as a consultant to the Labour government. He has written widely on unemployment, inflation, education, inequality, post-Communist reform and, now, happiness.

**David Newbery**, FBA is Professor of Applied Economics at Cambridge University and a Fellow of Downing College. He has been Division Chief of Public Economics at the World Bank and a visiting professor at Yale, Stanford, Berkeley and Princeton Universities. He was a Member of the Monopolies and Mergers Commission 1996–2002. He is currently working on regulation and privatisation, particularly of electricity and gas, and continues his interest in road pricing and transport policy.

**Stephen Nickell**, FBA is Warden of Nuffield College, Oxford from 2006, having previously been Professor of Economics at LSE. He is a member of the Bank of England's Monetary Policy Committee and President of the Royal Economic Society. A new edition of his co-edited "Unemployment : macroeconomic performance and the labour market" was published in 2005. His research interests include labour economics, employment, unemployment and wage determination in OECD economies, corporate performance and the determinants of productivity growth.

**Sir Nicholas Stern**, FBA is Adviser to the Government on the economics of climate change and development. He is head of the Government Economic Service and a non-executive member of the management board of HM Treasury. He was Director of Policy and Research for the Commission for Africa which reported in March 2005 and is currently completing a review of the economics of climate change due to report to the Chancellor in the autumn of 2006. He served as Chief Economist and Senior Vice President of the World Bank from 2000 to 2003 and was a Professor of Economics at the LSE. His latest book, with Dethier and Rogers, is "Growth & Empowerment: Making Development Happen" (2005). He has published books on crime, criminal statistics in the UK, public finance and development.

**Jean Tirole** is Scientific Director of the new Institut d'Economie Industrielle (IDEI) at the University of Toulouse I, founded by his late colleague and co-author Jean-Jacques Laffont. Before that he was a Professor at MIT and the Ecole Polytechnique in Paris. His most influential book is "The Theory of Industrial Organisation". His research interests include industrial organisation, regulation and competition policy, network industries and new information technologies, insurance, and banking and finance.

## **Contributors**

We wish to acknowledge the efforts of all who contributed to the production of this document.

**Conference notes were taken by:** Malcolm Botting  
Mark Franks  
Stuart Glassborow  
Katie Law  
John Scholar  
David Silk  
Alex Sweet  
Phil Weston  
Chris Yiu

**Editors:** Daniel Ingram  
Andrew Jowett  
John Scholar

Whilst every care has been taken to ensure that the contents of this document are accurate, the editors accept full responsibility for any inaccuracies that may be present.

## **HM Treasury Lectures on Microeconomics and Public Policy**

May 2004 – June 2005

- **Tony Atkinson** (15<sup>th</sup> October 2004)
- **Richard Blundell** (10<sup>th</sup> December 2004)
- **Peter Diamond** (6<sup>th</sup> May 2005)
- **John Hills** (14<sup>th</sup> January 2005)
- **John Kay** (4<sup>th</sup> March 2005)
- **Paul Klemperer** (4<sup>th</sup> June 2004)
- **Richard Layard** (24<sup>th</sup> June 2005)
- **David Newbery** (12<sup>th</sup> November 2004)
- **Stephen Nickell** (2<sup>nd</sup> July 2004)
- **Nicholas Stern** (14<sup>th</sup> May 2004)
- **Jean Tirole** (11<sup>th</sup> February 2005)

The aim of the lecture series was to share perspectives on the direction of modern microeconomics, both theoretical and empirical, focusing on the implications for policy-makers and the decisions that they face. The course was organised and opened by Sir Nicholas Stern, Head of the Government Economic Service, and brought to the Treasury leading academics working on the microeconomics of public policy.

This document is a collection of summaries based on notes taken during the conference presentations. It covers a wide range of economic issues applicable to policy making in the 21<sup>st</sup> Century.