

## ***Introduction***

Economics as an academic discipline has two valuable strengths. First, it trains people to think analytically. Second, it provides a number of important insights into how the economic and social world actually operates. But despite these advantages, students at all levels have turned away from economics in large numbers. The purpose of this article is to offer both some reflections on the current situation, and some suggestions on the way ahead.

I remember being shocked as a young researcher when Maurice Peston<sup>1</sup> told me that he felt there were only around a dozen useful things in the whole of economics which ought to be taught. The rest was either mere conjecture or positively wrong. Of course, it was said slightly tongue in cheek, and the follow up line was that this small number of concepts was so important that *everyone*, regardless of their main subject, should be exposed to them.

## ***Incentives matter and can be interesting***

Maurice Peston's view is one to which I have become more sympathetic over the years. To give just one positive example, the idea that agents respond to incentives - to prices - is an extraordinarily powerful one. It is as close to a universal law of behaviour in economics that we have. In practice, of course, quantifying these effects may be very difficult, not least because the strength of the response to a given set of incentives is emphatically not universal. It varies with the social and institutional setting and with the historical context.

But the idea that agents respond to incentives has many applications. The Mayor of London - Ken Livingstone, a man of impeccable Left wing credentials - is using it to try

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<sup>1</sup> Formerly Head of the Economics Department at Queen Mary College, University of London and editor for many years of *Applied Economics*. A member of the House of Lords for over 10 years

to help solve London's traffic problems. A congestion charge is to be levied on the movement of cars into Central London<sup>2</sup>, in the hope that this will cause a sufficient number of drivers to abandon their cars and switch to public transport. We do not have to buy into the complete package of free market ideology to recognise that incentives matter.

Yet another area where incentives are important is crime. Again, we do not have to believe wholeheartedly in rational, utility maximising agents to recognise this. The proposition that poverty causes crime is often dismissed scornfully as a figment of the imagination of bleeding heart liberals. Look at the 1930s, it is said. People were poorer then but crime was much lower. But hard hearted economics tells us that the *relative* set of incentives faced by agents is important.

Most crime is committed by young men with low levels of skill. The widening of inequality from the 1970s onwards altered the relative set of prices which they faced and, not surprisingly, crime became a more attractive option. As the UK economy has moved back towards full employment in the 1990s and a minimum wage has been introduced, the appeal of ordinary jobs has increased, and crime has fallen (British Crime Survey, 2001). Agents have responded to the price mechanism. Of course, this is by no means the whole story, but it is simply not possible to give an account of how crime changes over time without considering the role of incentives (see, for example, Ormerod et.al., 2002).

Why, then, has the number of students choosing economics dropped sharply, and how might they be persuaded to move back? Economics can be extremely interesting, but agents in the market - students - are telling us that it is not. The set of incentives they face either discourages them from taking up economics in the first place, or leads them to abandon it as soon as possible.

### ***Dogmatism***

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<sup>2</sup> such a scheme is of course already operational in Singapore, for example

I think that an important reason for this is that the teaching of economics has become too dogmatic, and too much is claimed for the achievements of the discipline. Economics should be taught instead as more of a way of thinking about the world which can be of help in understanding a wide range of business, economic and social issues. An engineer teaching students the mathematics of, say, bridge building, can afford to be dogmatic. A enormous number of bridges has been constructed on these principles and, most of the time, most of them stay up. Economics is far from being in this position, yet it is often presented as though it is. Textbooks have come to resemble those of engineering, as if many problems have been solved and students simply need to absorb a settled body of knowledge.

Let me give two examples. The first relates to the widespread assumption in economic theory that agents are rational maximisers. John Sutton of the LSE has recently reflected on this question: "The student who comes to economics for the first time is apt to raise two rather obvious questions. The first relates to the economist's habit of assuming that agents can be treated as rational maximisers .... by the time that students have advanced a couple of years, this question is forgotten. Those students that remain troubled by [it] have quit the field; those who remain are socialised and no longer ask about such things." (Sutton, 2000).

Some of the most interesting work in economics in the past twenty years has been on the topic not of rational maximisation, but of bounded rationality, on situations in which, for example, some or all the agents have access to incomplete information. Professional economists have gained prestige and even Nobel prizes for this work. George Akerlof and Joe Stiglitz, two of this year's prizewinners, have pioneered this area, and have made extremely interesting contributions<sup>3</sup>. These models usually attempt to explain a particular question, rather than purporting to be *the* general theory of how agents behave.

But most economics courses for most students remain fixated on the old-fashioned theory based on rational maximisation which, as John Sutton notes (op.cit.), many students

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<sup>3</sup> for example, Akerlof (1970), Salop and Stiglitz (1977)

simply disbelieve. Judging by the content of the top economics journals in recent years, a lot of the big names in the profession in America do not believe it either.

The second of my examples relates to the formula which is drummed into students as one of the cornerstones of economics: set price so that it equals marginal cost. The numerous surveys over the decades which have shown conclusively that this is not how business actually sets prices have not shaken the faith of economics textbooks in this proposition.

Now, the formula may make sense under very special conditions in a static world full of identical products and ruled by diminishing returns. Almost any economics textbook purports to demonstrate this proposition. But supposing that firms operate not under diminishing but under increasing returns. In other words, the cost of producing an additional unit of output falls rather than rises. In these circumstances, setting price equal to marginal cost is a guaranteed recipe for bankruptcy. Firms could never recover their costs by following this pricing strategy<sup>4</sup>.

In the age of the internet and the network economy, it makes no sense at all to regard increasing returns as an aberration, as a deviation from the ordered world of economics textbooks. Increasing returns are not universal - I doubt, for example, whether the highly traditional and fragmented German beer industry exhibits them - but they are pervasive. Interesting things can be said about what might happen under increasing returns, but they do not figure in the textbooks, even though Sraffa's devastating critique of the treatment of returns to scale in standard economic theory was published as long ago as 1926.

### ***Game theory?***

A number of influential conventional economists claim that the discipline has been revolutionised by game theory in the past twenty years. I only want to make brief comments here on what is a very interesting subject. Certainly, game theory is intellectually intriguing, and it can be illuminating.

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<sup>4</sup> A good reference on the whole question of returns to scale is Keen (2001)

One of the best books on game theory in my opinion is written by a game theory enthusiast. David Kreps' *Clarendon Lectures* were given in 1990, but the problems he identifies for game theory haven't really been dealt with in the subsequent decade. This is why I think it is such a good book. There are lots of technical details, but he is at pains to stress the serious limitations of the game theoretic approach. It cannot inform us about an enormous range of practical situations. A key point he makes is that, and I quote, 'game theoretic techniques require clear and distinct rules of the game'. Kreps believes this is so important that he puts it in italics.

But, in a nutshell, this seems to me to restore the paramount importance of institutions and process. Game theory is being held up as the new jewel in the crown of conventional economics. But here, at the heart of orthodox theory, institutions are the key. For game theoretic techniques to be of value, clear rules of the game are needed. But, to adapt a famous quote, where do these rules come from? Do they fall from the sky like manna from Heaven? Of course not.

### ***Institutions and economic history***

The emphasis in economics on universal rules of agent behaviour has led to the severe curtailment of courses on institutions and economic history<sup>5</sup>. I believe this to be seriously misguided. Consider, for example, what are perhaps the four most important episodes in the economic history of the twentieth century:

- how in World War Two the Allies, in particular the United States but also to some extent the Soviet Union, were able to increase war-related production massively and rapidly
- the contrast at the end of the two world wars in the transition back to a peace-time economy
- the Great Depression of the 1930s
- the economic crisis of the mid-1970s.

None of these topics can be analysed properly without reference to economic theory, and often pretty high level stuff at that. For example, the micro-economic rules of behaviour of firms and consumers, the role of the price mechanism, industrial structure and organisation, the macro-economic impact of monetary policy and wealth effects, the impact of expectations - all of these are involved. But, equally, none of these episodes can be understood properly without an appreciation both of the role of institutions and of the particular historical circumstances of the time.

### ***Personal Computer based models of agent behaviour***

It now seems to me that probably the most restrictive assumptions of orthodoxy - restrictive in that it severely limits its capacity to illuminate many real world problems - is the assumption that the tastes and preferences of agents are fixed. In some circumstances, such as when a shopper is in a supermarket and is choosing between different brands of a product, fixed preferences are not a bad assumption to make. But in a wide range of circumstance, individual agents are influenced directly by the actions of others.

In conventional theory, agents respond to the decisions of others only in so far as these affect the prices of the goods and services which the individual buys and/or sells. They do not want a Teletubbie, say, or a hula hoop or, much more seriously, a 30 year US government bond rather than a French one, simply because other people do. But in the real world this sort of behaviour is pervasive. From fashion markets to financial markets to the degree of optimism or pessimism which firms feel about the future, the opinions and behaviour of others affects directly how individuals behave. This is the key theme of my book *Butterfly Economics* (Ormerod, 1998).

There is a good reason why standard economics makes the assumption that tastes and preferences are fixed. Once it is relaxed, even apparently simple models become

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<sup>5</sup> An interesting account of this is given by Hodgson (2001)

extremely difficult, and usually impossible, to investigate analytically. Certainly, applying the economist's favourite piece of maths, calculus, is not going to get very far in this context.

However, the development of the personal computer means that we can now begin to investigate the properties of the much more realistic models in which agents' behaviour can be influenced directly by the behaviour of others. This ability to begin to understand systems in which agents can alter each other's behaviour directly is, in my view, by far the most important methodological development in economics for many years. It will eventually change completely the way in which economics is done.

### ***Personal Computer models of agent behaviour: an example with the Tobin tax***

I want to give an example of this in the context of the Tobin tax. This is a fashionable issue at present, which could engage the attention of students. The idea of the Tobin tax is to tax transactions on foreign exchange markets. All deals which exchange currencies would be subject to a tax. Currency dealings related to genuine trade flows rather than speculation could be exempt, but these are only a small fraction of the total trades in currencies which are carried out daily. The purpose of the tax is to achieve two aims. First, to reduce the amount of dealing in world currency markets. And by so doing, to meet the principal aim of the tax which is to reduce the size of fluctuations of currencies against each other.

The tax leads to an immediate discussion of conventional supply and demand analysis. It needs a bit of thought as to the nature of the product which is being taxed, but once this is achieved, orthodox theory does indeed suggest that the tax could meet its first aim of reducing the amount of dealing. Further, we know of lots of empirical examples where an increase in price has led to a reduction in demand.

On the key issue of volatility, we might wonder whether there is any empirical evidence on this topic as well. Given that the Tobin tax does not exist, this might seem difficult.

But we can look round to see if any other markets in financial assets exist in which turnover is taxed. There is in fact an obvious one, namely the UK stock market. Stamp duty is levied at a rate of 0.5 per cent - far higher than most suggested rates for the Tobin tax - on all transactions in UK equities. Yet a simple time-series plot of the rate of change of asset prices in this market suggests that volatility is high. The transactions tax does not seem to have dampened volatility here.

As an illustration of the interplay between applied and theoretical work in economics, we must then turn back to theory to try and give get better answers to these questions. Standard economics does not have much to say about volatility. Its focus on comparing static equilibria - before and after a tax is imposed, for example - leads to a neglect of the dynamic process by which markets evolve over time. Economics says a lot about equilibrium, but little about the paths which might be followed towards it. Indeed, Kenneth Arrow, who placed a great deal of economics onto a modern mathematical basis at the level of very high theory, has described the volatility of financial markets as 'an empirical refutation' of general equilibrium theory (Arrow, 1994).

This is where interacting agent models can make a contribution. Alan Kirman (1995) developed a model of financial markets in which the individual agents follow very simple rules of behaviour, but the interactions between them give rise to complex behaviour of the market as a whole. Plausible rules for individual behaviour give rise to exactly the kind of high levels of volatility at the aggregate level which we observe in financial markets<sup>6</sup>.

Now, one of the advantages of a good theoretical model is that we can use it to think about what might happen if circumstances were different. At present, there is an enormous number of deals in currencies carried out every day. We have good evidence that the Tobin tax would reduce this number. And we can use the Kirman model to ask: what is likely to happen to the volatility of currencies if the number of deals is cut back? The answer from the model is unequivocal. The volatility will certainly not be reduced. Indeed, if the

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<sup>6</sup> A non-technical description is given in Ormerod (1998)

number of deals fell really drastically, volatility would rise, not fall. Is this conclusive? Not necessarily, but at least the basic assumptions of this model have empirical backing, and the results it produces seem to describe what happens in reality. So we must take the analysis seriously.

### *Summary*

The material discussed here requires a summary rather than a conclusion, for these are a set of ideas rather than a comprehensive manifesto. Above all, I feel that economics must stop being taught as if it were a received and validated stock of knowledge on the same scale as, say, engineering or physics. This is far from saying that the development of knowledge is exhausted in these two disciplines - this is transparently not the case - but they each have a solid and very substantial set of demonstrable achievements.

Being an economist involves not so much the possession of a particular stock of knowledge, but of a state of mind. It involves accepting that progress towards understanding complex problems in the social sciences can be made by setting up and analysing theoretical models which simplify, often drastically so, the reality they are intending to describe. But it also involves a recognition that we must be aware constantly of the need to have empirical grounding for our models. Further, it involves realising that any particular pattern of behaviour which we observe cannot necessarily be applied automatically in other contexts. The specific ways in which agents behave can be influenced by the particular institutional setting and the historical context. Unlike the particles on which physics is based, the building blocks of economics are people, and these can act with purpose and intent to modify their behaviour.

Finally, on a purely practical note, I think that the teaching of economics should:

- use topical issues, particularly those involving policy implications, to illustrate a range of ideas
- provide some empirical grounding for theoretical models in the courses

- make sure that all economics students know something about twentieth century economic history, and the importance of institutions
- take advantage of advances in computer technology to enable students to use interacting agent-based models whenever possible.

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