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|--------------------|--------------------------|-------|-------|-----------------|
| Mutual A: | S&P 500 | 17.72 | -0.04 | BlendE |
| St | 32.09 | -0.07 | | ValRes |
| Invst: | Asset | 45.89 | -0.09 | FPA Fu |
| Gr | Growth | 31.20 | -0.07 | Capit |
| IA | SmCap | 15.95 | +0.09 | Federal |
| nc | | | | AmlDr |
| AMRO Funds: | Bear Stearns Fds: | | | CapAp |
| N | S&PStrA | 25.52 | -0.21 | EqInA |
| GroN | S&PStrB t | 24.86 | -0.20 | GSStrat |
| | S&PStrC | 24.85 | -0.21 | US Gvb |
| Funds A: | Berger Group: | | | Federal |
| v p | Growth p | 7.79 | -0.03 | AlDrB t |
| p | SCVInst | 29.93 | -0.10 | EqInCB |
| aIA p | SCVInv | 29.83 | -0.10 | Federal |
| ipA p | SmCoG p | 2.92 | -0.01 | GnnalS |
| ev p | | | | IncTrS |
| tA p | Bernstein Fds: | | | Kaufm |
| t p | TxMgIntV | 16.40 | -0.20 | MaxCa |
| gG p | IntVal2 | 15.04 | -0.19 | StockT |
| IA p | EmMkts | 15.88 | --- | MaxCa |
| A p | | | | StockT |
| GA p | BlackRock Instl: | | | Fidelity |
| tl | IndxEql | 22.50 | -0.05 | TechBj |
| p | LgCpVII | 13.03 | +0.02 | Fidelity |
| igA p | SeIEql | 12.13 | -0.04 | TechT |
| | SCapGrI | 12.30 | -0.05 | Fidelity |
| Funds B: | Brandywine Fds: | | | EqGrA |
| t | Brndywn | 22.76 | +0.04 | Fidelity |
| tB t | Brazos Funds: | | | EqGrB |
| ipB t | SmlCap | 18.16 | +0.01 | EqInB |
| tB t | Brinson Funds A: | | | GrOppl |
| tB t | TctAIA | 26.40 | -0.06 | MidCpl |
| GB t | Brinson Funds B: | | | Fidelity |
| qB t | TctAIB | 25.78 | -0.06 | EqGrC |
| B t | Brinson Funds C: | | | Fidelity |
| qB t | TctAIC | 25.96 | -0.06 | EqGrI |
| qB t | Buffalo Funds: | | | EqInI |
| qB t | SmCap | 20.78 | -0.18 | |
| Funds C: | CDC Nvest Fds A: | | | |

Sex, Drugs, & ECONOMICS

Diane Coyle
 Author of *Paradoxes of Prosperity*

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TABLE OF CONTENTS

Acknowledgments

Introduction: Why economics trumps common sense

I Sex, Drugs and Rock'n'Roll: economics really does apply to everything

1. Sex: Can you have too much of a good thing?
2. Illegal drugs: It's the economy, man
3. Risky business: Why don't teenagers behave more like economists?
4. Sports: The market for egos
5. Music: The New Economy's Robber Barons
6. Food fights: Helping lame ducks waddle

II. What governments are good for: public goods, externalities and taxes

7. Infrastructure: But I never travel by train
8. Energy Taxes: Industry 5, Environment 1
9. Auctions: Call My Bluff
10. Tax incidence: Only people pay tax
11. War games: A government's gotta do what a government's gotta do

III. New technology: how business is coping with change

12. Movies: why subtitles need subsidies
13. Networks: 'The program has unexpectedly quit....'
14. Internet: The economics of dot.bombs
15. Industrial change: Jobs old and new

IV. There's a world out there: globalisation isn't all globaloney

16. Disease: No man is an island.....
17. Multinationals: Sweatshop Earth
18. Immigration: The missing link
19. Demography: The south has the last laugh
20. Development: The triumph of fashion

V. Life, the universe and everything: macroeconomics

- 21 Japan: Kogaru versus one-kei, or why Tokyo's teenage fashions matter
22. Inflation: Targeting the sleeping beast
23. Defence Spending: A farewell to the peace dividend
- 24 Weather: Why economists care about the sex life of pigs
23. Work: why do it?

Epilogue: In praise of Economics

Ten rules of economic thinking

Glossary

References and Websites

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INTRODUCTION:

Why economics trumps common sense

Writing a book to popularize economics might seem to many people a madly ambitious project. There are many reasons for the subject's lack of general appeal. One fundamental reason is that it can seem so gloomy – after all, it earned the title 'the dismal science' almost as soon as it was born in the late 18th century, in reaction to the prediction of inevitable mass starvation by one of its early practitioners, Thomas Robert Malthus. The usual subject matter, of recession, unemployment, debt, hunger, poverty and so on, is quite simply depressing.

This unpopularity is in one way deeply unfair. For the aim of the economics profession is to extend the opportunities and choices available to everybody in their daily lives, aiding as many people as possible in their quest for well-being. Economics has its eyes firmly fixed on making this a better life, in the fullest sense and not just financially.

But in another way the subject's reputation is well-deserved. Courting unpopularity sometimes seems to be the *raison d'être* of economists, the dirty realists of the social sciences. Economists are the only people who warn constantly about difficult choices and trade-offs – summed up in the catch-phrase 'there's no such thing as a free lunch'. Choosing one course of action means closing off another; spending more now means having less to spend later. So economists can often seem like party-poopers. What's more, they do it using a scientific approach and lots of difficult mathematics.

Many of the tenets of economics also sound highly counter-intuitive or counter to common sense. Cutting farm subsidies will make farmers better off? Financial markets help reduce risk? And imports are better for the nation than exports? What planet are economists from?

In fact, economics is essentially about scepticism, applied to human society and politics. Economists constantly ask questions – why is this happening, is that claim true, will a proposed policy actually work, who benefits from it? It is a subject born out of the Enlightenment two hundred and fifty years ago, the intellectual movement whose elevation of the power of reason

and evidence shaped modern science and democracy. David Hume, the 18th century philosopher and one of the founding fathers of economics, described the approach as ‘an attempt to introduce the experimental method of reasoning into moral subjects’, to quote the subtitle of his great ‘Treatise of Human Nature’.

This book aims to demonstrate that economics is essentially a particular way of thinking about the world, and can be applied to almost any situation affecting individuals, companies, industries and governments. It is a way of thinking that involves having the highest respect for empirical evidence, looking at charts and numbers, and working out what it makes sense to believe. This is not only intellectually satisfying, it also offers an unparalleled understanding of which policies and strategies will make our societies function better. No other discipline can achieve the same enlightened pragmatism.

Economics also assumes that people are rational in the sense that on the whole they will act in their own best interests. The assumption gets taken to extremes in much formal economics, which is based on figuring out the behaviour of individual ‘agents’ who bear more resemblance to Star Trek’s Mr Spock than to real, emotional, confused and illogical human beings. What’s more, a recent branch of the subject, behavioural economics, emphasises psychological realism instead. Still, rationality is a good, common-sense working assumption. People are certainly not totally rational in real life, but if you are going to argue that they consistently behave in ways that are not in their best interests, you had better have a convincing explanation for it.

So, for example, whenever the stockmarket crashes economists are widely mocked for believing investors behave rationally and the financial markets are ‘efficient’ – because in that case why was a dot com company worth \$10 billion one day worth only a few hundred million the next? How can any piece of news justify a 5 % drop in the value of corporate Britain or America in a single day? There is no question that psychology and sociology have a crucial role to play in explaining what goes on in the stockmarket. However, it is always worth pointing out to the critics that share prices are supposed to value the entire future profitability of a company at today’s values. In other words, they have to take account of the fact that money in hand is worth a lot more than potential future money (a calculation known as discounting). A small change in expectations of profits growth in 10 or 20 years’ time can as a matter of compound arithmetic have a big impact on today’s valuation. What’s more, there is also a deep truth in the

economists' argument that investors are rational and will therefore compete away any lasting profit opportunities, for very few investors manage to beat the market for any length of time.

Similarly, people do not get married for purely economic reasons – well not often, anyway. Yet economists' models in which people choose, or ditch, their partners in order to maximize their financial gains can illuminate trends like single motherhood. Welfare payments and the low potential earning power of inner city fathers do go a long way towards explaining how it became a financially sensible choice as well as a socially acceptable one. Or like the growing division between households with two high-earners and those with two low- or no-earners, which is an important explanation for the increase in income inequality as more women do paid jobs outside the home. Those with high earning potential thanks to their background or education will have more success in seeking out similar partners precisely because they have got more to offer. The economic explanation is never the only one, but it puts the backbone into the political and sociological explanations.

Some critics, inside and outside the profession, argue that the emphasis on rational behaviour means that the use of complicated mathematical techniques has gone too far. Academics in other social sciences or the humanities do not like the attempt to apply the scientific method to human society and culture, especially when it leads to unwelcome (to them) conclusions. Others believe that the formalisation now required to get anywhere in academic economics, using 'models' based on unrealistic assumptions, is not only spurious when it comes to understanding the world, but also simply puts off many potential students. They prefer the realism of business school courses or the genuine technicalities of one of the natural sciences. For the professional economists, working through the mathematics of a simplified model that isolates a particular issue is the best way to gain new insights. It ensures rigorous reasoning. But – and there is a big 'but' – they have to be able to work out what the solution to the equations means. Economists must be able to explain their results to a wider audience, or we can suspect that they don't actually understand it themselves. It is, after all, a social science whose findings have a social meaning.

I intend to demonstrate that economics is not a set body of knowledge about certain financial subjects. It is instead a method for thinking about any subject. There can be an economics of anything, of marriage, sport, crime, drugs trafficking, education, movies and even,

yes, sex. Economics is one route towards understanding any aspect of human nature, and one of the most illuminating because of its analytical rigour.

Not that this means it is always possible to draw any definitive conclusions. A few things in economics *are* either right or wrong. If a country is importing more goods and services than it exports, it is also importing more investment capital than it exports, as a matter of accounting – the balance of payments deficit has to be paid for by foreign money, in an inward investment surplus. That is what makes it a ‘balance’ of payments. A country’s Gross Domestic Product (GDP) is always the sum of its components. Heading onto thinner ice, moving from straight accounting definitions to predictions, if something is in short supply or high demand, its price will tend to go up. Lower interest rates will usually stimulate investment. Beyond such basics, however, many supposed statements of fact in economics are usually controversial.

The reason is that finding the right policy, the one that’s in the interests of citizens in general, will almost always require a comparison of the costs and benefits, which is an empirical matter. The answer can vary at different times and in different countries. What’s more, different answers will look better to different groups of people, as their individual interests might well conflict, so there will be disputes about the evidence. So in some of the chapters in this book hard conclusions might appear to be missing. Sometimes economists will reach broad agreement on the empirical answer. At other times this will be difficult, as there is a lot of measurement error in the statistics, and sorting out cause and effect is intrinsically challenging in a complex and changing world.

Indeed, economics is a deeply political subject. The old-fashioned name, ‘political economy’, is perhaps more appropriate than ‘economics’. Economists will often reach different conclusions depending on their own politics, as some of the past clashes between different schools of thought in the subject demonstrate. For example, two competing schools, the ‘monetarist’ and ‘Keynesian’, offered conflicting explanations of the stagflation of the 1970s, the grim combination of slow or negative growth with high inflation. The monetarists were mainly conservatives and the Keynesians progressives in their personal politics. The very fact there can be competing schools proves that a lot of economics is not hard science. On the contrary, it often involves grappling to keep on top of whatever happens to be going on right now in the world, whether that’s recession, a technology-driven boom, high inflation, or deflation, or globalisation.

So if economics changes with events anyway, and its conclusions depend on the politics of its practitioners, why bother with it? To start with, anybody who would like the world to be a better place should be able to think like an economist. Whether you are for or against globalisation and free trade, whether you think poverty is inevitable or an abomination, if you think there are too many people in prison or too few, economics will allow you to assemble the evidence and line up the arguments. This matters to the extent that you personally care about being right and it might also make a real difference because public opinion sways public policy. If more people could think economics, we might find more non-partisan common ground and fewer logical inconsistencies in some areas of policy. As things stand, opinion polls show there are majorities in favour of both a cleaner environment and lower taxes on fuel, and for lower taxes in general and simultaneously better public services. Most people want to see an end to sweatshop labour and yet also want to buy their clothes as cheaply as possible. We might want impossibly contradictory outcomes, but we won't get them, and we will get better outcomes if policy faces up to the contradictions.

The detailed economic arguments are vital in almost any public policy question, where success often depends on the triumph of realism over idealism. The war on drugs? It can't ignore the profit opportunities waging this war creates for organized crime. Guaranteeing the electricity supply in the face of growing demand? The prices and investment incentives faced by the utility companies make all the difference between bright lights and blackouts. Protecting endangered species? Campaigns and policies will only be effective politically if they take account of the extra financial costs industry will face as well as the environmental costs.

Economics is central in government policy and all over the news. It affects each of us every day. It's important for our purely selfish concerns. Everybody cares about how much tax the government takes, anybody in business wants to figure out how much demand they might have to meet for their services and what wages they'll have to pay, and any working person is concerned about how best to save for tuition fees and retirement pensions.

The bottom line is that any informed and active citizen needs to understand the economic method of thinking. The more of us can apply a little scepticism and an ability to weigh up the evidence to any public policy issue, the healthier our democracies will be and the wealthier our nations.

Besides, it's fun. Unless you're a hermit with no interest in the world, applying economic principles opens new windows on life day after day. It makes almost every article in the newspapers potentially interesting. It breathes life into dry tables of numbers and abstract charts.

Take the driest possible example, actuarial tables of birth rates, death rates and life expectancy. They paint a picture of an ageing western population and a workforce that will start shrinking. It takes only a little economics to turn the dusty columns of figures into vivid scenarios. Will taxes have to rise much to pay the growing old-age social security bill? If so, we should worry as very high taxes have always fomented riot and revolution. Perhaps countries traditionally hostile to immigration like Germany and Japan will have to start importing young workers from poorer countries with plenty to spare, a development that would have enormous political and cultural ramifications. So maybe the ageing rich countries will opt instead for coping with population decline, say by later retirement ages, or by developing technologies that make the shrinking pool of workers more productive. Yet in the past the strongest economies have always had growing populations. Maybe these tables therefore spell out Chinese dominance of the global economy in the 21st century. These are big questions, and in no way boring.

Economics is therefore the subject for you whatever your interests and concerns. The aim in this book is to provide a new light and refreshing appetizer that might satisfy delicate appetites but also encourage some readers to develop a taste for more.

The first section kicks off looking at some areas where it might come as a surprise that economics has anything at all to say, just to prove that it offers a rigorous analysis of almost any subject that might crop up in day to day life. Then follows a section on government intervention in the economy to shed light on a variety of difficult public policy questions of interest to all of us. The third section looks at the changing structure of the economy, at how businesses and whole industries thrive and decline, in the face of new technologies. The fourth addresses some global issues which tend to arouse strong emotions and where, therefore, economics can play a particularly valuable role in the policy debate. The fifth section covers some traditional macroeconomic topics like growth and inflation. Even such a wide range of topics can give only a partial view of the scope of economics, which is, after all, all of human life in its endless fascination and variety.

The book wraps up with a more general chapter about economics as a subject, a checklist of things to remember in order to think like an economist, and a glossary of the concepts used earlier in the book. These are highlighted in bold in the text.

PART I

Sex, drugs and rock'n'roll: Economics really does apply to everything

The aim of this section is to make an unashamed bid for attention by showing that economics really does apply to everything in life, including some of the subjects that experience suggests interest people the most.

These first chapters cover the usual titillating areas – sports, sex, and various kinds of recreational behaviour that are bad for you. There's an economics of anything you can imagine, from embroidery to fishing, hairdressing to open-cast mining. The point is that what makes it economics rather than any other kind of analysis is not the subject matter, but how you think about it.

Chapter One

Sex: can you have too much of a good thing?

Sex sells. British tabloids, delivered to millions of homes every day, are notorious for their daily pictures of semi-nude women. The top shelves of the newsagents groan under the weight of a seemingly ever-increasing number of top-shelf titles. The number of new pornographic movies made each year is growing at a double-digit rate. Pornography is also the biggest success story on the Internet, and seems the one sure-fire route to profitability for a dot.com.

In short, sex is a big industry with a multi-billion pound, euro or dollar turnover and a large workforce. Official figures do not list it as an industry in its own right, but if they did they would show it is roughly on a par with a sector like electrical engineering in size. It attracts a surprising range of people as workers, like the pretty army sergeant who once posed for *The Sun* newspaper in just a small part of her uniform, or the official spokesman for then-Prime Minister Tony Blair who was formerly a writer stories for a raunchy magazine.

Yet one economist who had been carrying out research into the size of the prostitution industry mused that the real puzzle was not why so many women became prostitutes but rather why so few did. After all, the hourly rate of pay was so much higher than most alternatives, except perhaps for top female lawyers and management consultants – other professionals, in short. One estimate put the going rate for the services of a prostitute in the UK at about seventeen times the legal minimum wage. In addition the hours are flexible and you can work from home. Why then aren't lots more women working as prostitutes?

Similarly with other branches of the sex industry. If it is so profitable, why isn't there an even bigger supply of magazines, movies, prostitutes than we have already? You would expect enticingly large profits to be competed away and unusually high wage rates to be competed down.

The answer is, as a recent survey of the economic literature on this subject (which has lots of equations but no centrefolds) concluded: "In the context of sexual services, economic theory is useful up to a point, but non-economic incentives (or disincentives) must play a major role."

Still, economics can offer some insights into the sex industry. Just as in the example of the sports business, discussed in another chapter, a lot of the participants are playing out the laws of economics without realising it. It's all a question of **demand** and **supply**. These are the central concepts in economics.

Start with the supply side of the market for sexual services. Prostitution is usually illegal so a government ban strongly discourages new competitors from entering the market, thereby sustaining the high rate of profit. This official protection from competition can go a long way towards explaining the puzzle of the impressive size of porn profits. Likewise with illegal hardcore or paedophilic material. The ban restricts supply, which is socially desirable but as a side-effect boosts the profits of criminal entrepreneurs at the expense of consumers of such products who would otherwise have more choice and pay a lower price.

Legal pornography is a different matter. Maybe these sex markets are just not quite like markets for other goods, like candy bars, or for other workers, such as bus drivers. The supply of services provided to customers depends on the supply of and demand for sex workers. The labour market in this industry is obviously not like the conventional jobs market. For example, you do not often hear complaints about shortages of skilled workers in the pornography business. Indeed, I am told there are websites and magazines that simply publish amateur photographs sent in by enthusiastic readers. It is therefore unlikely to be skill shortages that keep sex industry wages higher than those in local shops, offices and factories. However, there could be an **inelastic supply of labour** due to the social inhibitions attached to work in this field. That means a labour supply that is not very responsive to pay, requiring a large pay rise to increase the number of workers available whenever demand steps up.

A second possibility is that the job market for sex workers is similar to that for other workers with careers that will probably not last very long, such as sports stars or dancers or perhaps bond salesmen. In these cases, people retire young so they get a pay structure that gives them high earnings but for a relatively short period. A wise blue movie star will therefore save a lot of his or her income to provide for a long retirement. High prices for the products of the sex industry could therefore reflect these high wage costs.

Another contributory factor on the supply side is that, while there do not seem to be any conventional barriers to entry in the industry, such as high capital requirements, natural

monopolies, regulatory restrictions or a formidable amount of know-how, there are likely to be some less-conventional barriers. The industry's criminal fringe and protection rackets will deter would-be entrepreneurs. It is after all quite a violent business because parts of it are illegal. Social inhibitions alone will put off others.

What about the demand side? Just as the supply has some special features, the nature of demand is not quite like demand in many other markets either.

There is certainly a lot of **product differentiation**. One reason is almost certainly that consumers' desire for privacy prevents the kind of price comparisons that take place in normal competitive markets, so there is less of the shopping around which normally competes down prices. The market is also highly segmented by individuals' differing tastes. In short, being turned on is not like going to the grocery store where you can see all prices clearly labelled and looking for the cheapest can of soup. Pornography, prostitution and other branches of the sex industry are **monopolistically competitive** markets, as the textbooks would put it. The products on offer in each branch of the business differ in small characteristics (do you prefer someone dressed as a schoolgirl or a dominatrix?) and different categories of customers will pay quite divergent prices.

There is some evidence that the range of prices is very wide. For example, a study of prices charged by UK prostitutes showed that location, duration and 'special services' had a big impact on price. Women could charge a lot more for visits to hotels or the client's home, for spending a long time with the client, and for services labelled 'kinky' in the economists' regressions. The supply of certain services is clearly very limited, and such women also get a lot of return visitors despite their high charges.

In short, the interaction of supply and demand can explain how the industry manages so successfully to part its customers from a lot of their money.

The Internet is transforming the structure of some parts of the sex market, like the markets for so many other goods and services. It has made it much cheaper, easier and less frightening to become a sex industry entrepreneur. It has also made it easier, cheaper and less embarrassing to buy pornography, boosting demand as well as supply. Most horrifically, this includes child porn. The porn industry in general and the Internet industry have in fact been mutually reinforcing as

consumer enthusiasm for downloading pornographic material certainly helped the Internet take off and spread so quickly to so many households.

Some of the demand will be accidental, as I once discovered when trying to find the website of the foreign policy journal *Foreign Affairs*. Many parents and employers are also installing screening software which might limit demand growth, although this doesn't seem to work too accurately at present. A friend found that her filter blocked access to the website of a piano music centre; heaven knows what the programmers thought *arpeggio* means. At any rate, somewhere there will already be an economist trying to estimate the impact of the Internet on profits from pornography.

The early indications are that the Internet has had a major impact on the supply of pornography, and there is indeed now enough overcapacity to have slashed profits from adult publishing offline. Trade sources estimated that UK circulation of pornographic magazines was 1.5 million in 1997 but down to 1.1 million in 2000. The decline has continued despite price cuts. Revenues from porn magazines are thought to have fallen from £5m to £3.4m over the same period. Not surprisingly, then, two of the biggest British publishers of such magazines sold off their magazine interests in 2001, one to concentrate on cable TV, the other on Internet porn. This parallels the way the Internet has the potential to cannibalise some other types of printed publications that have in the past earned very high profits thanks to peculiarities of demand and supply – academic journals, for example. Another supply shock in the sex industry has been increased immigration, with many more women from poor countries in Eastern Europe or Latin America to work as prostitutes, some of them unwillingly trafficked, in big cities in the US and Europe. This does seem to have reduced prices, which in turn has led to more consumers of the services on offer. The medical journal *The Lancet* reported results from surveys of 11,000 16-44 years olds in 1990 and 2000; in the first, 2.1% of the men said they had paid for sex during the previous five years, and in the second the proportion had climbed to 4.3%.

However, although the supply shock of the Internet and immigration might have had an adverse impact on profitability, sex is still a growth market. Of course, one peculiarity of the sex industry is that its customers are mainly men, so it is making its profits from only half of humanity. Whatever the gender-profile of the consumers, they are nevertheless buying more and more pornography as average levels of income rise. The **income-elasticity of demand** appears to be more than one, or in other words, spending on the sex industry is rising faster than incomes

overall. Pornography is technically a **luxury good**. In this it is like many other leisure activities, including movie-going, eating out, going to the sports centre, watching baseball and so on, which have grown rapidly as our societies have grown more affluent. When hours were long, work hard and pay low, few of us had the money or enthusiasm for a luxury like pornography or visits to racy bars and strip joints. Now we're so much richer in leisure and money it's a different matter.

Fun is becoming an increasingly important part of the advanced economies, which is something worth bearing in mind for anyone thinking about starting up a business. Of course there will always be demand for the basics of food, housing and shelter, but the big growth will come in markets where demand is growing faster than incomes as we become more and more prosperous. These range from conventional luxury goods – like designer clothes rather than \$10 t-shirts – to services of all kinds. These include education and healthcare, hotels and restaurants, but also a whole range of others in the leisure sector that statisticians class as personal services. What they have in mind is gym trainers, manicurists, aromatherapists, counsellors and so on, but sex workers are in there too: apparently, people think sex is fun.

Chapter Two

Illegal Drugs: It's the economy, man

Bill Clinton famously admitted during his first bid for the US Presidency that he had smoked cannabis as a student, but never inhaled. I have the opposite confession: I've never smoked it but have inhaled, at student parties where a number of other people were partaking and had filled the room with that characteristic pungent haze. Personally, I've never knowingly taken any illegal drugs, partly for purely rational economic reasons: as an impoverished student I could either pay £1.99 for a bottle of wine, albeit not the very finest, or pay a lot more for an illicit substance that didn't seem to do much more for its users than a little alcohol did for me. As the years have passed and I've grown richer, I've simply traded up to the £4.99 bottle of wine.

Some people will object to the idea that policies towards drugs should be anything other than a question of morality: drugs are just wrong. From this principle stems the 'war on drugs' being waged in the US, UK and other European countries. However, it wouldn't taken Stephen Soderbergh's movie *Traffic* for most people to realize that there was no chance of a literally zero-tolerance policy working when so many citizens of our countries use illegal drugs. A law that more than one in five people (almost one in three Americans over the age of 12) break at some point in their lives, and none of their friends will ever report them for, is a failing law.

There are three broad philosophical approaches to drugs policy. One is the ideal of a drug-free society, the approach that inspires so much of the rhetoric of the war on drugs. A second is the view that drug-use is an illness, suggesting that 'warfare' is not enough, and users need medical treatment and social programs as well. A third is the libertarian view that people should be free to use whatever they want as long as it doesn't harm anyone else, and in practice the widespread day-to-day tolerance of friends, family and acquaintances who do use drugs means politicians cannot ignore this principle even if they abhor it. (And after all, it seems many of them consumed drugs themselves as students.)

Economics can help shed some light on the philosophical and political debate. There is after all a market in operation, one where government restrictions have some very predictable effects. What the economics tells us is that price does matter, as well as all the non-economic considerations that apply to drugs policy.

There are few firm facts established about an illegal trade, but consider what we do know. The use of drugs appears to be a permanent feature of human life. The ancient Greeks used opium, the Aztecs peyote and marijuana. Human beings have been taking drugs in one form or another throughout recorded history. Consistent government attempts to prohibit any of them are a 20th-century phenomenon, a product of Victorian moral campaigners (although Queen Victoria herself is said to have used marijuana as a pain-killer). One of the most famous efforts, of course, was the 18th Amendment prohibition of liquor in the US in the 1920s. Prohibition was a descendant of Victorian temperance campaigns that promoted alternative, non-alcoholic drinks like sarsaparilla or dandelion and burdock. Prohibitions and social attitudes lack logic. For example, in early 21st century Europe and the US, alcohol use is legal although with possible penalties if drunkenness causes criminal behaviour, tobacco use is legal but strongly discouraged, and cocaine use is illegal.

Very many people today have taken illegal drugs at some time in their lives - up to a half in some western countries - not to mention the tens of millions of regular users of alcohol, tobacco and caffeine. Use of illegal substances is often no more than a youthful experiment. According to surveys, three-quarters or four-fifths of people who have tried illegal drugs got their first samples free, often at a party or rave. Dealers try to build custom by giving away samples, just like a manufacturer trying to create a market for a certain shampoo or soup. Surveys – which probably under-report the true figures – suggest that about a third of American adults have tried soft drugs like cannabis, rising to 50% amongst college students. In Germany and Switzerland the proportion of the population that has taken illegal drugs at some point seems to be about 20%. Can so many people be criminals in any meaningful sense of the word? Very many of us do not in our heart believe that the odd spliff smoked in college, inhaled or not, makes someone a criminal or even a bad person.

Very few people are regular, life-long users or become addicted, moreover. The same survey evidence suggests that although 17% of the Swiss had tried drugs, only 2% had taken anything within the past year. Drug consumption falls dramatically amongst the over-30s everywhere. Soft drugs are not addictive, whereas hard drugs are, although many people do just quit them anyway. For example, studies of Vietnam veterans showed that many took heroin in South East Asia but the overwhelming majority stopped of their own accord when they returned home. According to the US National Household Survey on Drug Abuse, one heroin user in three is dependent – high but lower than the four-fifths dependency rate amongst nicotine users.

On the other hand, despite the fact that many illegal drugs are not physiologically addictive, the demand for them appears to be growing over time. As prices have been on a downward trend, this might well reflect increased supply. All, drugs, however, can be damaging to the health (and that certainly includes the legal ones too), so their use imposes costs on the health care system and perhaps also on productivity at work. Research indicates that an increase in the retail price of heroin, one of the most lethal, does result in a large and significant reduction in the number of deaths it causes. So the health costs are substantial. However, the illegal nature of the business means much of the drug supply is low-quality or adulterated, and it is often this that kills users before the drug per se.

The worldwide market for illegal drugs is known to be huge, but how huge is a matter of reasonable guess-work because neither sales quantities nor prices are known for certain. One widely-accepted United Nations figure (from the World Drug Report 2005) was \$322 billion at retail prices in 2003 (much more than the approximately \$250 billion consumer spending on alcohol), employing around 20 million people and serving 70-100 million customers. Such are the profits in the chain that drugs farmers made about \$13 billion from their sales to traffickers, and the wholesale value of global output of illegal drugs was \$94 billion.

Perhaps half of the custom is in the US, the biggest single market for drugs as for everything else. Most of the 50 or so countries known to produce and export illegal drugs are very poor, and it is often their major cash crop. The earnings potential of the industry, combined with their other economic problems like falling commodity prices and heavy debt burdens, has probably led to a substantial increase in drug production by developing countries. Many big producers are also places of violent conflict – think of Colombia, Burma or Afghanistan – although whether that is a cause or a consequence of the drugs trade is not clear.

So if those are the broad facts, let's think like economists about the problem. In any **market**, there is **supply** and a **demand**. Policies can tackle both the demand side and the supply side of the market, and even in supposedly liberal countries like the Netherlands both types of prohibitive policies have intensified since the early 1970s. Generally, there are much fiercer penalties for supplying than for using drugs, but countries take very different approaches to punishing users.

Let's start with the supply side. Prices vary widely between different markets, depending on the degree of **competition** amongst suppliers. For example, figures for 1993 show a gramme of heroin ranging in price from \$43 in the Netherlands to \$196 in Switzerland. The prohibition on certain drugs in force in most developed countries restricts the competition to supply the substances concerned. In many cases there is, if not an absolute monopoly on supply, something close to it, maintained by appalling violence and brutality. Illegality creates such huge profits that cornering this market is a reward seriously worth fighting for – with street prices more than three times wholesale prices, profits globally run into the many billions of dollars. The tougher the prohibition, the more profitable (although risky) the business becomes because the competition gets squeezed out. Police and customs officers end up helping the most determined and brutal suppliers by removing their competitors from the business.

There is a very real sense, therefore, in which the policy of absolute prohibition – enforced by most governments of countries that import illegal drugs – has created a parallel economy controlled by organized crime. The revenues generated by the drugs trade need laundering, and extend the reach of the mobsters into other, legal, activities. This is a global economy too. In the opinion of many experts, ranging from UN officials to Manuel Castells, the respected Berkeley sociologist, the growing reach of the criminal multinationals threatens to undermine legal, democratic institutions. It also prevents the developing countries from aspiring to greater prosperity through traditional economic and political progress. Why should they bother when there is an easy source of cash earnings for their farmers, and one which happens to provide generous kick-backs for corrupt officials and politicians who have to turn a blind eye to the trade? If they destroy the crops, they just have a huge headache about what alternative livelihood the very poorest peasants can find. It's not surprising that weaning Afghani farmers off the cultivation of heroin poppies is one of the toughest challenges in reconstructing that country's shattered economy. Afghanistan produced 87% of the world's opium supplies in 2005, according to the UN. Output was down 10% from 2004's record volume, but drug enforcement policies by the Nato forces had reduced the area under opium poppy cultivation by 48% – the Afghan farmers managed to increase yields to make up for the loss of area.

Prohibition creates criminality amongst buyers as well as sellers. The fact that prices are so high and purchases so difficult draws many drug users into crime to finance their purchases, while their regular contact with suppliers might well make crime seem normal or even in that milieu socially acceptable. German and American studies suggest that about a fifth of the income

needed by addicts is earned legally, more than a third comes from drug-dealing, and the rest comes from either crimes like burglary and mugging or prostitution. A very high proportion indeed of crimes against property seem to be drug-related. Drug use is certainly one of the complex of social problems that barricade inner-city ghettos with poverty and violence.

On the other hand, high prices will help restrict demand, and the demand side also matters in determining the quantity of drug consumption. If illegal drugs were much cheaper, or if the legal sanctions were less severe, the number of users would be much greater.

How then can we weigh up the costs and benefits of different policies? Suppose a government were to consider liberalising its policy on soft drugs like cannabis, permitting small amounts for personal use and licensing suppliers. On the plus side, the removal of tough criminal sanctions would increase the number of small-scale suppliers and weaken the grip of crime gangs. Retail prices would fall. There would be less crime to police, both on the part of suppliers and users, so the policing budget could decline. Social costs from burglary and violence would diminish. The health of users might improve to the extent that quality could be controlled. The government could also raise revenue from taxing or licensing a legal trade.

Against these gains would be set some costs. A lower price would increase demand and might create more new users. That would have adverse health effects and perhaps also reduce the productivity of users. (There is not much evidence on whether drugs hamper work effort, however, and some argue it goes the other way. Some great writers and artists have been notorious drunks and rumour has it that the movie and TV industries would be nowhere without cocaine.) Some experts believe that tolerance of soft drug use also brings more people to hard drugs, which would amplify these costs, although others dispute this argument.

There have been a few experiments with alternatives to all-out war against drugs, and their results provide some suggestive evidence. One study, reported by the Centre for Economic Policy Research, compared heroin use in the UK and Netherlands. The Netherlands continues to prohibit drugs, including cannabis; but it has a relatively liberal policy towards users possessing small amounts, which extends to allowing the sale of small amounts of cannabis in licensed cafes. Amsterdam's cafes are thus one of the city's prime tourist attractions, along with its equally famous red light district and of course the canals. It combines this liberalism with a

tough regime for anybody caught importing or exporting drugs, with large fines and harsh prison sentences.

The economists found that between 1983 and 1993 heroin had cost £28 a gram on average in the Netherlands, compared to £74 a gram in the UK. Yet crime rates were lower in the Netherlands, and far fewer young people had used drugs of all types than in the UK. Drug users were also given more medical help. By 1995, the Dutch had the lowest proportion of drugs-related deaths in Europe, 2.4 per million inhabitants, compared with 9.5 million in France, the next lowest. The Dutch have even opened a retirement home for junkies. So in terms of reduced public health and policing costs, the Dutch experiment suggests there could be big benefits from a more liberal regime.

Another experiment in the conservative Swiss city of Zurich has been equally suggestive. Zurich is as tight-laced as Amsterdam is swinging. Yet despite heavily repressive policies, by 1987 drugs were being sold and used openly in the infamous 'Needle Park' behind the main railway station. The place was filthy, the number of addicts in poor health was growing, and the supply was controlled by gangs who offered drugs to schoolchildren at special low prices. High profits meant new gangs were trying to gain a share of the market, so new entrants from Lebanon, Albania and Africa started gang wars. And the property crimes committed by drug users to finance their purchases were rising exponentially. The police closed down the park, but the scene simply shifted to a disused railway station.

By 1994 the city authorities decided to experiment with a new approach. They now provide small, subsidized amounts of heroin to registered addicts, who must use the drugs in designated offices and accept medical or psychological treatment. Meanwhile the police have continued to crack down heavily on other suppliers but switched to a liberal approach to the consumption of drugs in private homes and parties. In many ways the new policy was a clear success. For example, the health of heavy users has measurably improved. More than half the registered participants got a regular job, and the vast majority of those who used to steal to pay for drugs no longer do so. In a December 1996 referendum the citizens of Zurich gave the policy an overwhelming vote of approval.

The liberalisation approach has also made headway in the United Kingdom, which has the worst drug abuse figures in Europe. In 2002 the government effectively decriminalized the

possession for personal use of cannabis, started experiments with medical use of this drug, and started a debate on downgrading Ecstasy to soft drug status. Despite this mild liberalisation, cannabis use has declined. A review of the policy concluded, however, that policy could limit the harm to individuals from drug use, but could not cut consumption. The reason was that massively increased supplies in global markets had led to falling street prices. Similarly, a review published by the Rand Corporation in 2005 concluded that there was no evidence the toughness or otherwise of the policy regime for cannabis affected levels of the drug's use, and either price or social acceptability must explain consumption patterns.

The economic case for the government intervention in the use of drugs at all is that health costs and social problems arising from consumer choices in the private, illegal market impose a cost on society generally that exceeds the private benefits of drug users' pleasure and drug suppliers' profits. This is known as an **externality**, which means that one individual's or group's behaviour affects other people. Externalities offer the classic rationale for government involvement in the marketplace, because private choices lead to a less than ideal outcome – too much illegal drug-taking in this example. Other examples include noisy parties, driving in a congested city, or indeed legal drug-taking.

The current solution is an outright ban on at least 'hard' drugs in most western countries like the United States and Europe. This is applied in the case of some other externalities. Some pollutants are banned or restricted, for example. However, it is relatively easy to tell when a particular factory is pouring toxins into the environment, but not so easy to keep tabs on the delivery of a very portable product from a large number of potential sources. In logistical terms, prohibiting drugs is a bit like banning imports of any other small, portable product – cheese, say. A ban on cheese might make addicts desperate enough to pay a high price and therefore make smuggling worthwhile, but a customs duty on cheese that made it only a bit more expensive at retail level would probably not be worth the bother of avoiding. Such a ban would also be expensive to enforce. This is why America's war on drugs is estimated to cost more than \$40 billion a year to wage, and accounts for more than one in ten of all arrests nationwide.

So another approach to tackling the externality would be to impose a high tax on drugs. This is precisely the approach British governments take to tobacco and alcohol. Both are very heavily taxed: more than half of the retail price of a bottle of wine goes to the government in tax revenues.

The tax is high because of the health costs of tobacco and alcohol consumption. The government would prefer a sober and clean-living workforce. But there are limits to how steep the tax can be, and because the duty imposed is high it does still need policing. The human predilection for tax evasion is almost as ancient as the fondness for drugs. The demand for drink and cigarettes is sensitive to the price, for it appears that duty on spirits and tobacco – although not beer and wine – is now so high that further increases would reduce legal purchases and therefore tax revenues, according to research by the Institute for Fiscal Studies in London. The Government has in fact already raised the excise duties to such a high level that it has driven some buyers of these legal drugs into the arms of bootleggers, with the associated costs of criminality and loss of tax revenue. This has at the same time, thanks to the lower price in the black market, increased consumption. There is a level of retail prices, including tax, that maximizes the tax take and limits the demand. This would be true of a drug such as cannabis too, were it to be legalized. How high the tax can go is an empirical matter that will depend on the size of the potential market, the costs of marketing the drugs and, crucially the **price elasticity of demand**, or how much demand responds to a small change in price. Still, consumption of cannabis might well be lower, the amount of crime and costs of policing lower, and tax revenues higher, if it were legal but heavily taxed, like alcohol.

There are a lot of mights and maybes here. Partly because it is so hard to assemble the data in the case of illegal drugs, economists do not have good estimates of the advantages and disadvantages of different approaches, and the implications of examples like the Dutch and Swiss experiments are hotly disputed. Yet an economist's reasoned **cost-benefit analysis** is not being considered enough in the policy debate. Even hardened non-users like me can see that the political gut reaction that there can be no let-up in the outright war on drugs is probably working against the public interest. The prohibition reflects the genuine strength of feeling on the part of many voters and politicians. Still, it's a real shame. It isn't that policy-makers are not putting a lot of effort into the problem – the European Union's officials on the Horizontal Working Party on Drugs* in the Home Affairs and Justice directorate must be amongst the most dedicated – but the moralizing rules out some options that might make sense. A breath of economic pragmatism here would blast away the fuddled haze of a stale drugs policy.

* This is not a joke – this working party really exists, and its meetings have a crowded agenda, published by the EU Commission.

Chapter Three

Risky business: why don't teenagers behave more like economists?

A lot of adolescents take **risks**. Unprotected sex, illegal drugs, legal but harmful drugs like tobacco and alcohol, fast cars, gang violence – the list of temptations is long and alarming. The worrying point about teen behaviour, to both their parents and the economics profession, is that by this age, they ought to know better. A fifteen-year old knows roughly what the consequences of their actions could be. They are deliberately taking risks and making choices that they know with certainty might not be in their own best interests: tobacco kills; unsafe sex can lead to pregnancy and disease.

It's obvious why this would worry their parents. The reason risky behaviour by adolescents bothers economists too is that it seems to undermine the foundation on which the subject rests: **rational choice**. This means that, given the information available, people will choose to behave in ways that are in their own best interests. They won't always have complete information. And their own interests can be interpreted fairly loosely. But at a minimum they shouldn't consistently harm their own prospects or do themselves damage.

Economists characterize people's behaviour as making choices based on **maximising expected utility**. It means that, just like Star Trek's Mr Spock, we should assess all the information we have and opt for the logical choice. Although we all know from the silly things we do when we're in love, or in a panic, or hungover, that this obviously exaggerates human rationality, it seems fair enough as a general proposition that people know best themselves what's in their own interests. Any other assumption seems unpleasantly paternalistic; each person is the best judge of his or her own **preferences**.

Unfortunately, teenage daring poses a problem when it comes to assuming people behave rationally, because so much of what they do clearly is not in their best interests, and at some level they even know that. So for that matter does the mid-life crisis, driving over the speed limit, or addictive behaviour like gambling or alcoholism at any age. The real trouble with this is not that a minority of irrational people are harming themselves, but rather the suspicion that there are so many exceptions they might undermine the very powerful tools economics gives us for analysing and solving all sorts of other policy problems. For if economic analysis breaks down in some areas of human behaviour, how can we be sure it works in others? For example, many

people strongly doubt that rationality is an appropriate assumption to explain the decisions of investors in financial markets.

Fortunately, some researchers have begun to reconcile economics with behaviour Mr Spock would find hard to understand, and thus preserve the power and insight of economic analysis. To do so they have turned to other disciplines, notably psychology.

The marriage of these two disciplines, known as behavioural economics, produces a more powerful analytical framework than either economics or psychology alone. While psychology can help us understand why people behave the way they do, the tools of economics are uniquely useful in helping frame public policies for helping guard people from their own foolish choices and for dealing with the wider social effects of their self-harm.

There is plenty of evidence that the principles of economic do in fact apply to risky choices. For example, if the price of tobacco or marijuana goes up, demand goes down. Or to take another instance, when the job market is healthy and there is plenty of employment, or when the perceived risk of infection is high, teenage women are more likely to use contraceptives. If there is any sign of people weighing costs and benefits, there is clearly some rational decision-making taking place. Furthermore, there is evidence from psychological studies that adolescents and adults are very similar in the attitudes they take towards the future consequences of various options. They are on average just as well aware of the risks, just as well able to make calculations about complicated future possibilities and just as disapproving about the negative consequences of drug use or gambling. Teenagers do not show any greater sense of personal invulnerability than adults – we all retain that feeling throughout our lives.

The differences therefore lie, not in how well or badly different groups are able to assess risks, but in their **preferences** for taking risks. While people as a whole are pretty bad at figuring out risks realistically, teenagers, like some middle-aged men, are more willing to take risks. Adolescents are trying to shape their independent identities as part of the transition to adulthood, and anybody in the throes of a mid-life crisis is in search of a fleeting reminder of youth. Psychology therefore comes in useful as an explanation for the preferences of different groups.

However, we are all rather bad at assessing risks anyway. So even the most level-headed amongst us tends to depart systematically in a few specific ways from the ideal of rational

choice. First, there is a strong human preference for immediate gratification at the expense of future satisfaction. In our psychological make-up we are what an economist would describe as **time-inconsistent** in our preferences. The outcome we prefer at every moment between now and the future is not what we would prefer when we finally get to the future.

This can even be quite explicit. Addicts, for example, know very well that they would prefer not to be indulging in the same kinds of risks in future but can't stop seeking the short-term gratification. The problem is one of lack of self-control, rather than poor risk assessment. And there are obviously different levels of sophistication possible. Some alcoholics don't acknowledge a problem, while others try to control their current behaviour by joining AA.

The second systematic departure from rational choice is that many people are very bad at predicting how they will feel about different outcomes in future, or what utility they will attach to the different possibilities, to use the jargon. It is impossible when you are young to appreciate that you might prefer different things when you are older: that a steady job and nice home will seem more appealing at 50 than hanging out on the street corner smoking dope with your friends. It's called a **projection bias** in people's preferences. We were all like that once.

We all know day to day how hard it is to act now according to future preferences: anybody who does the grocery shopping when they're hungry will know it's nearly impossible not to walk out of the store without all kinds of extra items, generally unhealthy, that were not on the shopping list. At the other end of the triviality scale, suicide is an extreme example of an inability to predict future well-being, specifically an inability to believe that it will ever be possible to feel less bad in the future than right now.

The evidence is that young people have a stronger preference than older people for immediate gratification. And they are also not as good at predicting what their future preferences will be. This makes sense: experience does indeed teach us some valuable lessons. So in these respects, the young are more likely than the rest of us to depart from rationality.

These psychological biases add up to a short-sightedness that results in over-indulgence in risky behaviour in general, especially by young people. Adolescents furthermore face objectively different costs and opportunities than adults. They don't suffer the same costs from sleeping off a hangover most mornings rather than holding down a regular job. They derive

greater benefits from impressing their peers (although of course some people never seem to grow out of this insecurity).

There is even a kind of rational fatalism about risk-taking, the idea that if you are going to go for it, you might as well be hung for a sheep as a lamb. It doesn't do all that much to alter the perceived balance of probabilities about future outcomes. Hence some teenagers indulge in risky behaviour.

The usual tools of economics can relatively easily be amended to take account of the psychological inclinations towards immediate gratification and misjudging future preferences. We can explain why teenagers, and others, don't show more sense and yet still be able to rely on the framework of rational choice and utility maximisation for economic analysis.

There are several other potential threats to the power of economics from the quirks of human psychology, though.

One is the importance of **reference levels**. People care more about departures of their income or share prices or any other indicator from a reference level than about absolute value. People also care a lot more about avoiding losses than about achieving gains – about twice as much, in fact. So in assessing their expected utility in various future eventualities, there will be an asymmetry around the point they start from today.

Similarly there is a **status quo bias** or **endowment effect**. Anything that's already around is valued much more than something that's only potential. Or to put it another way, a bird in the hand is worth two in the bush.

There is also evidence of decreasing value being attached to additional increments of income or other indicators of well-being. Thus the difference between £100 and £200 is valued much more than the difference between £1,100 and £1,200. This is described as **diminishing marginal sensitivity**. If the figure is weekly income, this makes sense. But it could be wrong in some other contexts – say the benefit derived from taking a drug. It could lead people to greatly underestimate the risks of something every time except the first that they do something.

Many people are also clearly altruistic, and they might have social goals that don't bear much relation to their selfish interests, indeed that might even reduce their own incomes. This suggests that each individual's utility might depend on that of others also, that they are not just maximizing their own expected utility.

Last, but not least, there is clear evidence that people are very bad at forming coherent judgements about the probabilities of different future outcomes. For example, we all worry much more about low-probability dangers such as a plane crash than high-probability ones like being run over crossing the road. Most of us find probability calculations very difficult.

These add up to a continuing challenge to the conventional economic approach in which rational individuals make choices that maximize their expected utility. Behavioural economics is an area in which research is in its early stages, and it isn't yet clear what systematic changes economists need to make to their way of thinking to incorporate the psychological evidence. The rational choice model of everyday economics has no difficulty at all in incorporating **uncertainty**, the sheer lack of knowledge about what the future holds; but it is much harder to bend it to the existence of systematic bias in people's assessment of **risk**, or the probability of one outcome rather than another. In some areas where assessments of risk and uncertainty obviously do affect people's choices, such as financial markets, psychological insight has greatly improved economic analysis. Whenever people are making choices about an uncertain future, economists clearly need to opt for realism over analytical purity.

Will behavioural economics help us persuade adolescents not to take silly risks? We can't make them behave more like rational economists, but economics could help answer policy questions like whether or not giving out free condoms or syringes makes sense, or how much welfare support to give teenage mothers. Clever policies will take account of the way young people assess their expected future utility. For example, the State of California used a poster intended to discourage young men from smoking by showing a drooping cigarette, the reasoning being that immediate sexual dysfunction (actually a low-probability result) as a result of smoking would affect their behaviour far more than the distant future risk of lung cancer or another tobacco-related disease (even though long-term illness is a high probability result from smoking).

The assumption of rational behaviour underpins much of economics, and it turns economic analysis into a powerful searchlight helping making sense of fog of confusion and complexity in the world around us. Nevertheless, good economists always bear in mind the fact that some behaviour is not fully rational, and we then need to turn to other disciplines like psychology and history for a fuller understanding of our fellow human beings.

Chapter Four

Sports: the market for egos

There is nothing more thrilling than the thwack of willow against leather, or so my husband tells me. No, not a bizarre sexual practice involving caning and leather trousers learnt at his English public school, but cricket, the traditional willow bat hitting the traditional red leather-covered ball to the distant boundary of the pitch. Nothing more thrilling except, perhaps, the roar of the crowd as some enormous Neanderthal flings himself over a white line in the mud, clutching an oval ball. Or perhaps a World Cup penalty shoot-out between England and Germany, two countries doomed to fight old battles for ever, at least in the minds of drunken soccer crowds. Yes, it's sport. A lot of people find it really exciting.

Somebody watching the Superbowl or the Olympics on TV might not realize it, but there's a lot of economics involved in sport. It's certainly big business, especially in the United States. According to a European Commission estimate, trade in all sports-related activities amounts to 3% of world trade. At his peak, Michael Jordan earned \$30m a year for playing basketball for the Chicago Bulls and twice that from his product endorsements, and that's just one sports star and just one sportswear company. In 2007 David Beckham signed a \$250m five-year deal to play for LA Galaxy, again not taking account of his earnings from endorsements and advertising. On a generous definition, including sports clothes, TV and advertising revenues linked to sports, and gambling, as well as the actual business of people going to watch events, sport could account for as much as 6% of GDP in the western economies. That's bigger than farming or the auto industry.

So even to somebody like me who hates watching sport, any sport, it is nevertheless rather interesting. In fact, the sports industry is a wonderful test-bed for economics. There is absolutely no shortage of statistics on performance, and all sorts of interesting twists to the structure of the job market and the industry. While some people like sport for its dramatisation of the universal human struggle and the search for meaning in life, others amongst us prefer it for its demonstration of fundamental economic principles.

The really big money-spinners are baseball, basketball, American football and ice hockey, all in the US, European soccer, and Japanese baseball. Only a few teams in any of these cases have managed to become truly global brands, like the Yankees or Manchester United, and

only a few individuals like Michael Jordan or Tiger Woods or David Beckham are genuinely global stars. I couldn't name a Japanese baseball team if my life depended on it.

A country's sporting traditions are intertwined with its culture and history. So the institutional specifics of team and league structure, and broadcasting arrangement, vary quite widely. Nevertheless, there are two aspects that make almost any sport anywhere economically interesting. One is the operation of a **labour market** where it is easy to tell how productive each individual is (such as how many goals or points they or their team score) and how much they earn as a result. The other is the **industrial structure** of a business where firms (the teams) need their competitors to remain successful enough to keep the competition interesting. A league which is won by the same team every year is really dull, so the weaker teams or players need to be good enough to deliver the bigger teams and star players their audience.

Take the labour market first. As every ambitious sports-mad kid now knows, becoming a top sportsman (not so often, yet, a sportswoman) is a potential avenue to unimaginable fame and wealth. Sports heroes rival, or surpass, movie stars and pop stars in their earnings potential. All of these are job markets in which **superstar** economics operates. This effect was first analysed by economist Sherwin Rosen with reference to the entertainment industries such as the movies and later extended to sport, and the idea has subsequently been popularised as the '**winner takes all**' phenomenon. Someone like a film star or sports star puts in all the effort up-front, and the amount of work they do is unrelated to the eventual size of their audience. David Beckham works no harder in a match for Manchester United, or Real Madrid or LA Galaxy, when the TV audience is 20 million than when it is one million or none. The bigger the audience the better, in fact. There are spectacular **economies of scale** operating in the **supply** of a certain amount of sporting talent, like acting or singing talent, in the mass media world. What's more, audiences find it more convenient to watch stars than unknowns because they know what they are getting. There is none of the risk of disappointment you might get with a new face. So **demand** conditions reinforce the superstar effect.

The more important broadcasting revenues have grown in sport, the more striking the superstar effect. Top players' salaries have pulled way ahead of the average. It operates in almost every sport, not just team sports like soccer and baseball, but also individual sports such as tennis and golf.

This explains why a report by accountancy firm Deloitte and Touche in London found that players' pay packets had swallowed up virtually all the extra money English football clubs in the Premier League had gained from TV revenues. Manchester United spent £45m on salaries in 1999/2000, of which its highest-paid player got £2.8m. The highest-paid player in the league got £3.6m. ManU could afford it, but smaller clubs were having to pay high salaries to their players too and were making a loss. The league as a whole made a pre-tax loss of £34.5m that year. The accountants recommended paying the stars as much as ever but cutting pay for the rest of the team. The superstar effect has intensified since then, with footballers like Beckham or Ronaldhino or Ronaldo being paid tens of millions of dollars or euros by their clubs because they are literally worth it in additional club revenues.

To many people such high salaries are an obscenity. Actually, this attitude isn't new. In 1929 Babe Ruth earned \$70,000. Challenged by a reporter to justify earning so much more than the President of the United States, he apparently said: "I had a better year." Still, the \$10m a year or more an American sports star could earn now compares favourably in real terms with Babe Ruth's modest income. Doesn't that make it all the harder to justify when teachers and nurses earn so little? What does the relative pay of a sports star and a teacher tell us about our warped social values?

In fact, the evidence is clear that our societies value health and education far more than sport. Spending on either of these takes a share of GDP at least twice as big as sport, and considerably more than that in some countries. Many parents spend thousands of pounds or dollars a year on school and college fees but wouldn't dream of spending as much on attending baseball games or watching pay-per-view boxing on TV.

The difference in salary between a teacher and Tiger Woods is explained not by differences in how society values their contributions, but by the **economies of scale** operating in their respective professions. This is mainly due to the technology (the supply-side effect), and perhaps a bit to our greater willingness (demand side) to hero-worship sports stars than lecturers. Until we get to the point where a talented and effective teacher can reach a massive audience through TV or the Internet, the revenues that can accrue to an individual teacher will be limited by how many kids they can fit into their classroom. And indeed some teachers in universities do have star status and correspondingly much greater incomes than their colleagues. The author of a successful textbook or a 'media don' with newspaper columns and bestselling books is an

example of superstar economics in teaching. The unit value per customer is probably similar in teaching and in sport, but the best athletes can reach a much bigger scale of audience than the best teachers. Sport is a low mark-up, high volume business.

Rather than proving different kinds of job are wrongly valued in our economies, the evidence from sport in fact demonstrates how well the labour market works. The pay of athletes can, uniquely, be linked to their performance as individuals. This is a huge contrast to any other industry where figures for pay cover broad categories of people and where it is anyway hard to figure out what each person's or each group's **productivity** is. Even if a data set giving individual pay levels is available, productivity has to be proxied by other measures such as educational attainment, work experience or family characteristics. With sports stars there are objective measures of each athlete's performance.

The really satisfying news for economists is that the best players now get the highest pay! And this despite the fact that the job market in most sports is not fully competitive and open, at least after the initial signing. For example, until recently US professional teams struck long-term exclusive contracts with players, with the sole legal right to transfer players to another team. In European soccer transfers still involve large fees paid between clubs, a system at last under investigation by the European competition authorities. In no other industry except Hollywood have employers for so long been able to appropriate the human capital of their employees. The relatively recent switch to a system of individual contracts in US sport has proven that wages are higher when workers, not employers, own the rights to the workers' performance.

Evidence from US professional sports also revealed clear race discrimination in pay during the 1960s and 70s, which had mostly disappeared by the 1990s. The explanation for the change seems to be that fans started out disliking the idea of integrated teams - baseball had no non-white players at all before 1947 - and were only willing to pay lower ticket prices to see them play. (Up to a point; fans also like to see their team win.) By the 1990s fans had stopped caring; the consumer taste for discrimination in sport in America had evaporated, in a possibly encouraging signal of a wider shift in social attitudes to race. English soccer hasn't yet got to that point. Recent research has found that a team paying the same wage bill as a competitor but using more black players will perform better, or in other words, teams can pay a lower price for equal talent when the players are not white.

The introduction of ‘free agency’ in sport might have raised pay for the players but it does also give the teams less incentive to invest in talent. Just like the old Hollywood studio system, a team could formerly develop an unknown, lose money on many of them at first but recoup the investment in the rewards when they eventually develop a huge new star. Under free agency players as a group do better but, as we’ve seen, some do a whole lot better than others. The others are probably losing out.

This will make striving to become a sports star an even bigger gamble than it has always been. It takes years of hard work to be good at a sport, with high risks of failure or injury or bad luck; but the probability of making a very large amount of money indeed is probably declining. The stars will do better but there are fewer of them, and the typical player will do worse.

Whether this will shrink the supply of would-be players in future is an open question. Quality in sport has been increasing, but that too could cease if the supply of potential players diminishes. Recently US team owners have used such arguments to strike a deal to restrict salary escalation amongst the top players, either on individuals or teams. Again, this is a unique phenomenon in the labour market.

It used to be argued, in defence of the old reserve contract system, that free competition in the sporting job market would allow rich teams to unfairly grab all the best players and make for a more boring contest because they would win all the time. However, a famous theorem in economics, first put forward by Ronald Coase, asserts that in terms of economic efficiency it doesn’t matter who owns any given property right - ownership of players’ human capital in this case - because any and every owner will want to achieve the most profitable outcome. The allocation of resources should be the same in either case. As long as teams could trade players freely, players would go to wherever they created the most market value, just as they would if they could compete directly in the job market themselves. In some sports the **Coase Theorem** more or less holds. There is no decisive evidence in those cases that team quality has become less balanced than in the past. In others, like major league baseball (so disgruntled fans have assured me), a clear gap has opened up between the best and the rest.

Meanwhile sports franchises sell for more than ever, so are clearly increasingly valuable despite the big wage bills. So it is hard to see the latest salary agreement between owners as

anything other than a bid to recapture some of the economic rents they used to enjoy and lost with the advent of free agency.

At least two major areas of economic interest already, and we haven't yet touched on the fascinating industry structure in professional sport. Teams are not quite like companies in any other business. While most companies from Microsoft to the local cafe would like to put the competition out of business, monopoly is no good at all to a sports team. It needs competitors, and it needs them to be good enough to keep the contest between them interesting. Otherwise potential spectators will watch *Big Brother* or *Millionaire* instead (and my goodness these are much cheaper options for broadcasters than paying for the right to screen big sporting events).

Anti-trust policies as applied to US professional sports have long dithered over whether teams should be treated as individual businesses that should be competing but are in fact colluding; or whether instead a league is a single entity producing as its output a contest between teams, in which case the competition should be viewed as different leagues and different sports. (In the US, teams compete in only one championship at a time; in Europe, typically in many at once, league and cup, international and domestic.) The latter view has won out in practice, with a number of important anti-trust exemptions granted to allow the collective sale of TV rights, for example, or to allow owners to reach collective agreements on pay structures. Similarly, the UK's Restrictive Practices Court accepted the argument that the Premier League could sell broadcast rights to its teams' matches collectively because that would promote financial equality between clubs, and stop the best clubs creaming off the bulk of the potential TV revenues by striking a separate deal with the broadcasters.

Whether fans mind imbalance all that much is a moot point - that is, an empirical question. As so many seem to support the best teams and want them to win all the time, collective well-being might be improved by less equality between teams rather than more. But of course supporters of the weakest teams would disagree. It is impossible to tell from theory alone. However, soccer-mad economist Stefan Szymanski has found that attendance has declined at matches in England's FA Cup competition, which have become more unequal, compared to the league matches where the league structure means that like teams play like.

If it is, then, right to think of the contest as the industry's output, rather than the effort of individual teams, then the teams contribute jointly to the value they add to the game and might

need to compensate each other. Sporting competition is the product consumers care about. Clearly if the weaker teams do not get the benefit of the value they add – if there is an **externality** in the pricing structure such that the private gains to an individual team are less than the social gains to the whole industry – they will have an inadequate incentive to compete. They won't invest enough in being good enough to keep the competition interesting.

Economists have not fully investigated the best way to solve this externality problem. A US-style salary cap is one way to balance competition between weaker and stronger teams, but it punishes excellence. In European soccer the solution is punishment of weak teams by relegation to a lower league, which is very costly in terms of revenue loss. There is massive potential for future Masters and PhD theses in this area.

So too in the role of broadcasting in sport, a constantly-evolving story. Market power in professional soccer, where the top ten teams (according to the annual Deloitte rankings) have revenues far ahead of the next group down, is increasingly interacting with the structure of the broadcasting industry, especially following the arrival of subscription TV. More than half the revenue growth for the top ranking soccer clubs in Europe between 1996/97 and 2004/05 was due to payments from broadcast rights. TV revenues are the most important source of income growth for sports in general. For instance, the value of broadcast rights for American professional football doubled in real terms during the 1990s, mostly after 1997 when CBS re-entered the bidding after the expiration of previous contracts from 1994-97 in which Fox had outbid it.

Similarly, the English Premier League is expected to have total revenues of £1.8 billion in 2007/08, the lion's share from sale of broadcasting rights. A new TV rights deal signed in 2007 will bring in £2.7 billion over three years, taking broadcast rights earnings for the top clubs from about £30m each under the preceding contract to about £50m. Premier League matches are shown in 195 countries and watched by about half a billion people. The amounts broadcasters pay the league have rocketed, but so too has the mass global audience.

Has competition amongst broadcasters for the rights to show sports that would attract lots of viewers reached its limits? In 2002 the broadcaster ITV Digital decided that at £315m it had over-paid for the rights to show the lesser-ranking Nationwide League soccer matches. It went into liquidation after paying the soccer clubs just £137m of the total revenues they were banking on – a financial catastrophe for the many clubs already committed to high salary bills. In the latest

Premier League negotiations the entry of Setanta Sports in competition with BskyB (following a ruling by the European Commission that the Premier League could not sell the rights to all matches to a sole bidder) increased the amount paid in total by broadcasters, but few analysts of the business think the broadcasters will make enough revenue to justify the amounts they paid. What the outcome will be in the longer run for broadcasting revenues and star players' salaries is not at all clear.

So here too is wilderness territory waiting for pioneer researchers to stake their claims. If there is uncertainty about the competition implications of the structure of the sport, it is redoubled by the deals that are being struck with the TV industry. This is a bigger worry in Europe, where not many people (apart from my husband and a few other sad cricket fans) care about any sport other than soccer and where the subscription broadcast market is more concentrated than across the Atlantic. But in both cases the sports industries clearly have the political muscle to be granted exemptions from the normal provisions of anti-trust law. Can this be right? Not to an economist, not even one who really hates sport.

Chapter Five

Music: The New Economy's Robber Barons

Bob Dylan turned 60 in May 2001. In an old BBC documentary re-screened to celebrate the great man's significant birthday, the young Bob - well, he would have been about 40 then - said: "There was no money to be made in music when I started out. If you could support yourself, you was doin' good."

The music business has changed a lot in the space of two or three decades. There are lots of new bands, which are, of course, nothing like as good as the old bands I used to enjoy as a teenager. As my old dad used to say then, complaining about Dylan and Bowie, The Clash and Roxy Music, young people listen to absolute rubbish these days.

The technology of listening to music has also changed. When my husband and I were once reminiscing about our favourite LPs, our then-10-year old said: "What's an LP?" They were as defunct to him as 78s and wind-up gramophones with big horns were to us. We have seen the invention of new broadcasting media, receiving and playing equipment, and new formats. The Internet has joined TV and radio; big radios with valves gave way to portable transistor radios, to the personal stereo and CD player, and then tiny MP3 players. Throughout each of these waves of astonishing technical change, the music industry has grown bigger and bigger.

According to industry figures, recorded music sales (physical and digital) to consumers amounted to \$32 billion in 2006, down from \$38.5 billion in 2000. The US accounts for about one third of this market. (Japan trails a distant second, followed even more distantly by the UK and Germany. No other individual markets are big enough to bother mentioning.)

Formats chosen by consumers have changed. Consumer preferences moved decisively away from cassettes, whose share of the market dropped from 50 % in 1990 to just 4.9 % a decade later and zero now. The CD share of sales rose from 38.9 % in 1990 to 89.3 % in 2000, but peaked there. Since then there has been a significant rise in online sales, which in 2006 accounted for 11% of the global market. Online availability particularly hammered sales of CD singles, which plunged by 38.8 % in 2000 after trebling between 1995 and 1999. There are two innovations which explain this shift from physical to digital sales. One is the portable MP3 player which requires people to have their music on their computer for transfer to the device. The other

is the development of online file-sharing, notably by Napster in the early days. The reaction of the music industry to the latter in particular is a cautionary tale.

First, though, it's noting that along with the formats, although less visibly, the structure of the industry has utterly changed. Rather than shrinking like the technology, the music companies have been getting bigger and bigger. So the key change in **industrial structure** has been an increase in the degree of **market concentration**. Small, independent record labels are more marginal than ever; the music biz is highly concentrated amongst a few giant global corporations like Sony, Bertelsmann and EMI. Even some apparently independent labels are owned or part-owned by the big corporations as channels for the discovery of new talent.

Few artists have any market clout at all vis à vis the music corporations. One or two truly giant stars are the exceptions who prove the rule. One is David Bowie, who was able to raise money by issuing bonds on the international capital markets, repaying investors with earnings from his back catalogue. Another is Robbie Williams who signed an £80m four album deal with EMI in 2002 – more on this deal later. However, few stars are big enough to be big businesses in their own right.

On the contrary, a higher proportion of artists are now very small businesses, because they can self publish. It is now very cheap and easy for anybody to make their own music in the spare room and distribute it online. Yet what they lack as an individual artist is the enormous marketing muscle it takes to turn a great song into a hit. The Recording Industry Association of America admits as much. In an article on its website about the costs of making a CD, it says: "Marketing and promotion are perhaps the most expensive part of the music business today." The scale at which the industry operates in marketing artists to the mass audience is what gives the corporations their power.

This is similar to the **scale effect** that gave the Robber Barons of American industry their fabulous wealth and influence at the turn of the 19th century. Then it took a lot of capital to build railroads or make steel. Now it takes a lot of capital to manufacture a pop star, or any increasingly all-purpose celebrity. The '**superstar**' effect that works for sports stars works for pop stars too. This, remember, means that audiences prefer known quantities rather than taking a risk on an unknown, and their preference can be satisfied when the **marginal cost** of transmitting the output of the favoured performer is as low as the new technologies have made it. The rewards to being –

and making – a star have been hugely magnified by the modern mass media. So along with the fact that new technologies have cut the cost of actually copying the music to zero, the importance of marketing and promotion means that the **economies of scale** exist in distribution and marketing rather than production; they are demand rather than supply side economies. And they are big. Music is one of the ‘core’ copyright industries (others include publishing, software, design and film) which together accounted for 6.5% of US GDP in 2004, more than any other industry group including autos and auto suppliers, and perhaps 8% of the UK’s GDP. All the copyright industries tend to experience superstar effects. The giant corporations in these sectors are today’s equivalent of the titans of the steel and oil industries in the heavy industrial economy of a hundred years ago.

In fact, the economic incentive to seek market domination is greater for them now than it was for the steel or rail barons in the early 20th century. Technological innovation has made manufacturing and distributing music very inexpensive. Once the backing musicians and studio technicians have been paid, copying CDs is cheap and distribution over the Internet is the next thing to zero cost. Operating at large scale is the most efficient. Ideally, Warner Brothers would like everybody on the planet to buy the latest Madonna album because turning her into a star was a fixed cost and the ongoing cost of selling her music is very low. She enjoys huge economies of scale. As it turns out, Madonna has thought through the economics herself, as we will see below.

Music companies use their degree of **monopoly power** to charge a higher price than this low marginal cost, and split the difference between (in ascending order of size) royalties to the artists, the marketing budget and profits. The companies are able to use the monopoly power made possible by the very large economies of scale to set different prices to different types of customers. **Price discrimination** between national markets is the most common form (although it is outlawed within some national markets). The price of a CD by a popular group like U2 ranged in late 2000 from about \$12 in New York to \$13 in Madrid, \$16 in Amsterdam and \$19 in London. This effect occurs even online. A single track on Apple’s iTunes store costs 99 cents in the US and 79 pence (158 cents) in the UK in 2007.

The trouble when the marginal cost of reproducing a song digitally is zero is that somebody who has a song can forward it to someone else free. No wonder Napster and similar Internet file-swapping services grew so popular in the late 1990s. Music fans found they could store music on the hard disks of their computers as MP3 files and swap said music via Napster’s

servers for other people's collections. All of a sudden it was possible to build up a vast collection of free music. If you heard a song and liked it, you could just download it instead of paying \$10-20 for that song bundled with a bunch of others on a CD. By the end of 1999 Napster had a million users a month.

It was at this point that the Recording Industry Association of America sued Napster, incidentally helping to publicize the service. A year later there were nine million users a month, not to mention other file-swapping services like Gnutella and Freenet, Aimster and OpenNap, some using central servers but others not, instead operating as a peer-to-peer network. The RIAA argued, mainly through spokesmen like the heavy metal band Metallica, that Napster was cheating artists of their rightful rewards for their creativity. Why, they asked, would anybody struggle to make a name for themselves, go on exhausting tours, work hard at new albums, take lots of drugs and have sex with a different groupie every night (no, of course they didn't really say that last bit) if the financial rewards were going to be undercut by unlawful breach of copyright as kids swapped music files for free over the Internet? Eventually the courts found in favour of the RIAA, concluding that Napster was breaching copyright. Napster itself has opted to go legit after the February 2001 judgement, having signed a deal with Bertelsmann to ensure that only listeners who have paid can download files. The business is surviving but hardly thriving.

What about the 50m-plus young music lovers who had five years to grow used to swapping files for free over the Net? Will they shrug their shoulders and return to the habit of buying CDs whose tracks they mostly haven't heard and with no flexibility about how the pieces of music they buy are packaged together? Will they be happy to once again start paying \$10 or \$20 for every one of these pre-packaged items? To pose the questions is to answer them. The music industry is one where rapid **technological innovation** is causing upheaval in the market. Technology is unleashing a tide of what the economist Joseph Schumpeter called 'creative destruction', a period of great change which kills some businesses and gives birth to new ones. It poses a real challenge for **business strategy**.

After years of opting to fight the new technology, the record industry has embraced it, although probably too late to ever stamp out informal file sharing between music fans. Still, the record companies themselves, along with legal download sites like iTunes, account for a growing share of music sales. Online legitimate sales of music have grown from virtually zero in 2003 to more than \$2 billion in 2006. Moreover, the industry, and the musicians themselves, have

recognised that there are other ways to make money. To go back to that Robbie Williams-EMI deal, EMI is taking an unusually high proportion of Williams' earnings from touring, publishing and merchandising, earnings which formerly musicians kept themselves. However the profits are shared, it is the touring and merchandising which are now more profitable than selling pre-recorded music. Profit margins on CDs and downloads are irretrievably lower than they used to be in the pre-Internet days.

It's not yet clear how the balance of market power between corporations and customers will settle – it is going to depend on the law, which backs the copyright owners, and the technology, which on the one hand undermines the ability to protect copyrighted material but on the other hand is increasingly better able to protect it through 'digital rights management'. But the music industry brought this upon itself. It declared war on its best customers in the Napster case. Even being charitable, the corporate tactics have been heavy-handed.

Napster gave its users two things they really valued. One was free music. The other was more choice. Customers tend to like both lower prices and additional choice.

The industry could have taken a different tack without abandoning its defence of copyright by acknowledging that customers would prefer the distribution method made possible by the new technologies. It could have welcomed the idea of selling individual songs online, perhaps for a registration fee, perhaps for a small charge per song. Music fans like to get music for free, sure, but most would be willing to pay something for the ability to swap files legally. The industry could even have decided to give some tracks away for free online through the labels' own sites in order to attract customers for full-length CDs. After all, CD singles accounted for a small fraction of industry sales, \$222m out of \$14.6billion or 1.5 % of the market, in their peak year.

The strategy would probably give the music industry lower profit margins than selling high-priced CDs to a captive market that can't get access to the music any other way; but then it's a sad fact of life for the music barons that there is now an alternative means of accessing music, and there is nothing any of them can do about it. Popular technologies do not vanish until something better comes along. A number of new Internet music ventures are therefore starting up subscription services, mostly backed by big corporations such as Vivendi and Sony. Napster gained lots of headlines but it will prove to have been the tip of an enormous new iceberg.

If it had taken a different approach, the industry might actually have found that file swapping increased demand for music. For it is possible that free online access to some songs could eventually boost sales by allowing users to sample work by artists whose music they would never have bought on impulse but discovered they liked. In other words, free file swapping is equivalent to the free sachets of shampoo or face cream that manufacturers hand out to get you to buy their brand, or even the free sample CDs that sometimes come attached to magazines and newspapers. (It works too. I've bought full-length CDs from several popular music outfits I'd otherwise have imagined were far too young and trendy for me.) It's a tried and tested marketing device.

The worst fears of the big corporations are almost certainly overdone. Other technologies have been seen as posing a threat to earnings from copyright in the past. The early arguments about radio were very similar to those made now about file sharing over the Net, with free broadcasts expected to make it impossible for musicians ever to earn a living again. Photocopiers were seen as a fatal threat to book publishing, and VCRs were expected to undermine the movie industry. But in each case when consumers value the final product the issue has been the distribution of the profits rather than their existence. What's more, the pattern has been that the falling cost of reproduction of artistic output, whether acting or music or words, has favoured the biggest companies and the biggest stars, because of the creation and reinforcement of demand-side economies of scale.

The Internet did unleash a wave of optimism about the scope for removing the need for intermediaries between performers and audience. After a slow start, that seems to be happening. The band Radiohead, for example, sold its new album to fans directly online, inviting them to pay whatever they thought it was worth – an invitation worth the band's while because there was no longer any need to pay a record company's profit margin in the price. While direct online sales are certainly technically feasible and cheap, however, it is an option still only valuable to stars who are already well known. The whole process of creating the demand for specific performers in the first place is very expensive, so there is still a role here for the record companies as intermediaries between artists and listeners.

The Internet does, though, pose a threat to the music industry's old system of distribution. Worldwide music sales have been in trend decline since 2000. The reason for the fall isn't hard to

find. Monitoring companies report that there are dozens of new file swapping communities, post-Napster. According to one of the monitors, one single type of software that allows file-swapping was downloaded 3.2 million times in one week, and 5.3 million users were offering a copy of Linkin Park's *Hybrid Theory*. The industry initially wanted to get lawmakers to make it illegal to sell hardware, such as the machines that burn music onto blank CDs, with the capacity to copy non-encrypted music and films. It wanted anti-piracy measures hardwired, on the grounds that this is the only way to protect intellectual property and ensure musicians get paid. When that failed, the industry focussed on the technological solution – encrypting songs through digital rights management – and continued taking to court music fans who swapped songs.

But the hardline option is not the only way. There are many other ways to structure payment for music. The fuss about copyright theft and piracy is a red herring. Online music threatens a particular music industry business model far more than it threatens the protection of the intellectual property created by musicians and singers. In future, paying for music will simply have to be different than the industry's past structures, pleasingly profitable as they were in the good old days. EMI has signalled the way in spotting the profitability of tours and merchandise. After its Robbie Williams deal, Prince gave away CDs free with a newspaper to promote his UK concert tour. In 2007 Madonna left Warner Brothers and signed a \$70m 10-year contract with a concert promoter, who will arrange her tours and sell CDs and merchandise direct. Selecting a different distribution mechanism, Paul McCartney signed a deal with Starbucks and the Eagles with WalMart.

Any set of institutional arrangements has supporters with strong vested interests in its preservation, and so it is with pre-recorded CDs. Online music sales will not be good news for these people, who include the manufacturers, the shops which sell CDs, and the record labels that stick their heads in the sand. Metallica has claimed file-swapping might stop them creating any more music, so a general move online would be bad for them and their fans too. However, manufacturers of MP3 players and computers that can burn music onto blank CDs will do well out of it. So will the record labels and musicians that decide to sell their music direct over the Internet or who concentrate on performing live on tour and at festivals. As the lead singer of Anthrax poetically put it: "Our album is the menu. The concert is the meal."

Oh yes, and music lovers will benefit too.

So that's the choice facing the industry: give the customers what they want, or pursue them through the courts. It's a tough one. The industry is still leaning heavily towards legally hammering consumers. But new technologies usually end up benefitting the customers not the companies, although, as past experience shows, it can take quite a struggle to get to that point.

Chapter Six

Food fights: Helping lame ducks waddle

If paper clip manufacturers were given a multi-billion dollar subsidy direct from the government, and gained as much again in extra revenues because the government restricted imports of cheaper foreign paper clips, you might imagine they'd be pretty contented about the state of business. Even better if the subsidy from the taxpayers took the form of a guaranteed minimum price per paper clip that exceeded the cost of manufacture. And if that meant there were mountains of unwanted paper clips dotted at sites around the country so the government switched to paying manufacturers not to make any more paper clips, well that would be even more pleasing. Money for doing nothing.

It would obviously be a mad policy to apply to the paper clip industry. Yet we seem to think it makes sense for farming.

Few people realize the scale of farm support or the almost total degree of protection agriculture in the EU, US and Japan gets from international competition. In the European Union direct agricultural subsidies from the taxpayer amount to just under Euros60 billion a year, and farmers get an additional hidden subsidy of over Euros60 billion a year from consumers because import restrictions keep prices about a third above world market levels. This is apparently enough money to buy every one of Europe's 45 million cows a round-the-world first class air ticket. In the United States the support amounts to \$100 billion a year, or about \$370 per person. Total OECD agricultural support is worth over \$300 billion a year. That's more than the GDP of all of Africa. It exceeds the annual profits of the 25 biggest companies in the world, from General Electric and Exxon to Toyota and Nokia. No other industry gets anything like the same degree of subsidy. In fact, all other industries put together do not get a state handout as big as agriculture's.

Not surprisingly, setting government-guaranteed artificially high prices for many agricultural products has led to over-production; this is pretty straightforward economics. The market price of anything is determined by cost or **supply** conditions and **demand**, but if the government is going to pay a higher than market price producers will supply more than buyers want at that higher price.

The result of over-supply in agriculture is a surfeit of all kinds of foodstuffs, from sheep to sugar beet. For example, the UK's sheep population before the 2001 epidemic of foot and mouth disease had climbed to 21 million, or one for every three humans. New Zealand recently abolished sheep-farming subsidies altogether, but then it had long passed the point where it had more sheep than people. No longer does the EU's surplus butter mountain weigh more than the population of Austria, as it did in the early 1980s, but only because the Common Agricultural Policy has started to subsidize farmers to produce nothing instead of producing too much.

In short, farming, which accounts for between 1% of GDP (in the UK) and 3% (in Italy) – in other words, not much – is sucking in a subsidy equivalent to 38% of its output in Europe. In the US, where average farm profits are higher because farms are bigger and can take advantage of economies of scale, agriculture still gets a 22% subsidy.

Who pays for the subsidy? We do, both as taxpayers and as buyers of food. There is in effect a tax of 25-35% on food prices due to government price support schemes and restrictions on imports. To spell that out, a £100 family grocery bill would be just £75-80 without the special protection for agriculture.

So why do farmers always complain that they are on the verge of bankruptcy? And if so many are feeling the pinch, what would it take to set this lame duck industry waddling on its own two feet?

The answer to the first question is that farming is tough for a very simple reason: there are too many farmers. Miners, steelworkers and shipyard workers have all in recent decades been through the same harrowing experience of being surplus to the economy's requirements. In addition, farming in the US and EU is divided into big agri-businesses which are doing rather nicely thanks to economies of scale and huge subsidies, and struggling small farms which cannot compete on the same terms despite their subsidies. The big-business farms don't need the handouts, and unfortunately the small farms are not going to be saved by them.

Industries decline because of changes in supply and demand. On the supply side, farming technology has changed, with more intensive methods and new breeds of crops (genetically modified the old-fashioned way by cross-breeding or genetically modified the high-tech way), making it more productive. **Productivity gains** in agriculture mean the same amount of grain or

pork or whatever can be produced with less labour and even a bit less land too, which is why only 1-5% of the workforce in the OECD countries works the land now, down from between 25 and 50% a century ago. In addition, technical improvements and cost reductions in transportation mean low-cost supplies from other countries are able to compete with domestic farm output – when not kept out by trade barriers.

On the demand side, **consumer tastes** have changed. Consumers everywhere have developed more varied tastes and grown used to almost all produce being available at all seasons. Few would be happy only to eat what could be home grown, never mind just locally grown as some environmentalists would prefer. Even bananas were considered an exotic luxury in the post-war years, whereas now all kinds of tropical fruits are commonplace. Sushi has grown into a global industry, and a modified Indian cuisine has become a British staple, requiring imported spices and vegetables. Would anyone in Britain want to revert to the rightly notorious traditional cuisine of overcooked beef and boiled cabbage? Or give up lemons and bananas? I think not. Consumers are now used to a far more varied range of foods, despite the artificially high cost of imported foodstuffs.

These changes have occurred against a background of scant liberalisation in agricultural trade. There has been little to no reduction in import restrictions on the shipment of farm products into OECD countries for decades. This is a real bone of contention for developing countries, which are becoming increasingly determined that trade liberalisation will have to include agriculture in future. Their anger forced agricultural protection onto the agenda for the round of trade negotiations launched in Doha, Qatar, in November 2001 and reduced levels of protection are due to be negotiated. Six years on, as I write, and agricultural subsidies are still a hurdle to signing a new trade deal. Trade disputes over food products flare up frequently, although often between the US and EU, by far the two most protectionist authorities when it comes to agriculture.

In farming, both in Europe and North America, the pain of long-term structural decline is being dragged out because the industry still experiences such high levels of protection from imports and domestic surplus capacity. Of course there are excellent political reasons for this. The experience of the Second World War made self-sufficiency in food seem imperative, at least in the starving European nations, right after 1945. Food also has an important place in every

culture, whether it is simply a matter of different tastes or of deeper religious belief and social ritual. After all, even McDonalds has to adapt its menus to suit each country.

Farmers are also in every country a powerful and effective political lobby, with techniques ranging from emotional blackmail through campaign contributions all the way to dumping manure the length of the Champs Elysees. Small and focussed groups are often the most effective lobbyists, especially when they can offer as their visual icons for the TV cameras cuddly lambs or waving golden prairies. Such images tug the heartstrings far more than an economist with grey hair and glasses tapping away at a computer ever could. They are all the more effective because everybody feels genuine admiration for the smaller farmers trying to preserve our rural heritage while producing high-quality food, and genuine sympathy for them when they struggle with epidemics such as foot and mouth disease which hammer their earnings even more. That should not, though, divert us from the realisation that profitable industrial farming has no need for our tax dollars. What's more, government subsidies in farming cannot get competed away. If paper clip manufacture were subsidized, a lot of new firms would go into the business and compete prices back down. But with a more or less fixed supply of farm land and number of farmers, new entrants are not going to be attracted into the farming business by all that taxpayer largesse.

However, it is hard to believe the appropriate public policies should have changed so little in the past 50-plus years. The economist's agricultural policy prescription for the 21st century is straightforward but radical. Liberalize trade; pull the plug on the grotesque subsidies; and if you must compensate the workers of the land until they can cope with commercial realities like everybody else in the economy, subsidize them to do something consumers actually want like running nature reserves or golf courses.

Trade first. Economists think about trade in a way that most people find strange and counterintuitive. Commonsense says exports are better than imports. Economics says this is wrong: the benefits from international trade come from being able to import more things at lower prices, while the exporting is just what you need to do to pay for imports. Commonsense says countries are competing against each other to increase exports, an idea encouraged by various competitiveness "league tables". Economists say that all countries gain from trade, that there are no losers. In fact, it is even worthwhile being the only country reducing trade barriers because the cheaper imports will increase consumer welfare. If you must compare countries in a league table,

then something like income per head or the human development index is the best available ranking.

These contrasting attitudes come about because economics is about increasing the well-being of individuals, not about, say, having the biggest car industry or the richest farmers in the world.

As Adam Smith pointed out in *The Wealth of Nations*, it would be perfectly feasible to grow greenhouse grapes and make a very fine burgundy in Scotland, but nobody has ever thought it sensible to ban or tax imports of wine from France into the UK because of the effort and expense of producing it at home would be too high. So the Scots export whisky and the French export wine.

The basic principle of international trade is that countries should export the products in which they have a **comparative advantage**. It is another of the cornerstone concepts in economics. If country A is better at producing shoes than clothes and country B better at clothes than shoes (even if country A does both better than country B), A should export shoes and B clothes. International specialisation ensures global production is efficient, occurring at the lowest cost, which makes consumers in both countries better off.

International trade is simply a means for getting access to the technology and resources of another country, in the most efficient possible mix with your own. Trade is almost always a win-win affair for consumers – that is, people. Us.

Of course, domestic producers of those items in which another country has a comparative advantage don't see it that way. Often they will argue that their industry needs protection from 'unfair' cheap imports to safeguard jobs, because they are not able to match the low costs of goods produced in sweatshops or farmed on plantations overseas.

However, plentiful and cheap labour is precisely the source of comparative advantage in many developing countries. They *ought* to be specializing in the export of labour-intensive products like basic textiles or fresh produce, just as rich countries ought to be specializing in capital and knowledge-intensive goods and services. Unless the developing nations can grow

their economies, too, they will be stuck at cheap labour levels of income for ever, so short of a magic wand the more they can export, the more they grow, and the faster wages rise in future.

Small European countries, short of land and densely populated, certainly do not have a comparative advantage in agriculture. It is a different matter producing grain in North America, but Americans and Canadians would be better off too if imports of many agricultural products were liberalized.

If protectionists in developed countries win the argument they indeed save some jobs in factories or on farms that might otherwise vanish, but saving these jobs imposes a cost on every consumer who buys the product and also prevents the creation of other jobs. Restricting trade protects some citizens at the expense of others. It raises prices, fewer of the protected items are bought, consumers have less to spend on everything else, and the economy grows less. These costs can be high, depending on what's being protected, but they are widely spread and hard to assess, whereas it is easy to spot the 5,000 jobs that might vanish if a particular company goes bankrupt because of competition from abroad, or to point to the small farms that will go under.

The general arguments about the benefits of trade and the allure of protectionism apply to agricultural output just as much as anything else. Substitute any agricultural products for whisky and wine or shoes and clothes, and the reasoning is the same. What makes wheat or butter any different from shoes and cars? The only possible reason would be food security, but the modern world has already gone far beyond national self-sufficiency in food. This mattered very much in a country like Britain when enemy U-boats blockaded the ports, but another naval war like that really does seem rather unlikely.

So farmers should be weaned off import protections. We'd pay less for our food – something low-income families especially would appreciate, as the food bill can make up half their family budget – and have more to spend on the services and goods produced by other industries. What about the direct agricultural subsidies? Is there a good reason why farming should receive more in government aid than all other industries put together, especially when the typical farmer is a well-off businessman, not a struggling son of the land?

The answer is no, and not only because the money could be used for better purposes. The price guarantees have harmed farmers too. They have kept in business some less-productive

farms and guaranteed an over-supply of many agricultural products. In their desperation to make a profit in these conditions, farmers have been driven to increasingly environmentally-damaging intensive production methods. This is especially true in Western Europe where geography means the economies of scale enjoyed on farms in the US Mid-West or in some Latin American and Eastern European countries are out of reach.

The doomed quest for competitiveness in an industry with too many suppliers kept alive by the drip feed of taxpayers' money has led to the use of increasingly powerful chemical fertilizers. It can be blamed for the BSE (otherwise known as mad cow disease) epidemic, spread by farmers insisting on ever-cheaper feed for their cattle, a demand met by rendering scrapie-infected sheep carcasses. Similarly, Britain's foot and mouth epidemic was exacerbated by the practice of hustling thousands of animals around the country to centralized distribution centres and abattoirs – and also to other farms for short stays that would enable farmers to claim they had bigger flocks and were therefore entitled to bigger government subsidies.

It is also likely that subsidies as prevented farming from changing in line with consumer tastes, although the industry is at last starting to adjust to the desire of wealthier customers for premium foods, whether specialty produce or organic output. Small farms, closest to the edge, have responded to the market out of desperation, but big farms have been locked into the industrialised production of cheap food by the existing structure of subsidies.

Abolition of farm subsidies would certainly put many farmers out of business. That would be the point. Easing people through the transition of the perpetual industrial restructuring that takes place in the economy is a valid use of public funds. So there's no doubt some of the tax money used for farm support would have to be used instead for some time to enable farmers to switch their land to other uses, or sell it for other uses such as forestry or country parks, or to retrain the people affected and help them move to alternative jobs. Land prices would fall directly when the subsidies were removed, and it might therefore be thought desirable to pay a one-off amount of compensation, as a matter of political tactics if nothing else. Governments might also think it a good idea to subsidize different countryside activities – wildlife conservation for environmental reasons, for example. There is no doubt mistakes would be made in alternative uses of public funds too, but they would be much less expensive ones.

The hope would be that farmers or other purchasers of the land would opt for commercially viable activities instead of milking the government. In other words, the countryside would be used for activities that reflected people's preferences as indicated by what they are willing to pay for. Tourism, after all, accounts for a bigger share of GDP than agriculture (more than 6% in the UK compared to just over 1% for agriculture) and is growing rapidly.

The bottom line is that if you believe farming is worth such massive financial support from taxpayers and consumers, when steel production or shipbuilding or coal mining was not worth a far smaller amount of subsidy, you need a non-economic argument to justify it. National security will hardly do, as many countries have allowed their shipbuilding skills to vanish; if they need a new warship in future, they'll have to import it. (Nor were farmers noticeable for their support for the declining mining or shipbuilding industries twenty years ago.)

In the end, continuing farm support boils down to sentiment exploited by a powerful special interest group. And to ignorance too. Few people realize just how expensive their food is because of agricultural subsidies. Do we really feel warm and happy enough about farmers to pay an extra third on top of the price of our grocery bills? Think about what you would do with another \$25 or \$50 a week, and see if it changes your mind about how big farm subsidies should be.

PART II

What governments are good for: public goods, externalities and taxes

Most economists, like any citizens, are interested in aspects of public policy, or in other words what governments do. Government plays an important role in our lives, one that is continually developing and certainly not shrinking. Quite the reverse: public policies are becoming ever more significant in setting the framework in which we go about our work and business.

The following chapters look at some important and topical examples of what governments do, using a powerful intellectual toolkit that can apply to many kinds of policy. The aim is to demonstrate the particular kind of critical attention economics can bring to bear on some of the really stupid things people – politicians or pundits – often say about government policy.

Chapter Seven

Infrastructure: But I never travel by train.....

Should the government own and run the railways? To a Continental European the answer is obviously yes, to an American obviously no. To a Briton, the formerly publicly-owned then privatised national rail system appears to have brought the worst of both worlds. It seems to offer the certainty of delay and disruption together with the alarmingly high risk an accident, all at high prices, and there is a vigorous debate as to whether or not it should be renationalised.

The rail system is a good example of the difficulty of figuring out what governments can do better than the private sector. In theory this is pretty straightforward. There is a role for the government whenever there is a **market failure**. If the private sector would not produce enough of a particular good or service because the social gains exceed any private gains they might reap, then the government should step in. Thus in the case of big projects like constructing a national rail network or building a tunnel under the English Channel, private sector companies might well not be able to recoup an adequate return on their investment from fares on any reasonable time horizon. The private sector incentives, and hence the need for government involvement, are likely to differ in different places and at different times. There can also be additional motivations such as social fairness in the provision of free or subsidized public services such as defence or education to people who could not otherwise afford them. But the basic justification for raising and spending taxes is the existence of an externality that means the market would deliver a less than ideal level of provision of the service in question.

In practice, however, different countries vary enormously in what activities take place in the public rather than the private sector. The size of government in rich OECD countries varies widely between the United States and Sweden, both, like all those in between, very prosperous economies. What's more, the boundary changes over time. A number of countries have followed Britain's lead in privatising certain nationalized industries, getting the government out of providing (although not out of regulating) those activities. At the same time, the scope of government has increased in other directions, mainly new or growing types of welfare spending such as housing and sickness benefits and pensions. The public-private boundary therefore clearly reflects voter preferences, and historical accident, rather than any objective assessment of the existence of any market failures or indeed pure ideology.

That doesn't mean there are no economic principles involved in drawing the boundary, however. The long experiment in planned economies behind the Iron Curtain demonstrated comprehensively that the public sector is very bad at very many kinds of economic activity. It's lousy at producing the right number of pairs of shoes in the right sizes and colours. It can't innovate in consumer electronics. It finds it really difficult to produce enough grain or vegetables. In many eastern bloc countries, it actually banned jazz, fiction and other popular arts that consumers would like to have purchased. Almost everybody had housing but the quality was dreadful. The list goes on and on.

On the other hand, the communist experience suggests the government can be reasonably good at delivering a high average level of education and health care, at basic scientific research, and at the delivery and popularisation of high quality sport and the high-brow arts like ballet and opera. Public transport in pre-capitalist eastern Europe was cheap, frequent and the quality was generally rather high, a legacy that lingers on. Any Briton waiting for hours today in a tatty station for a delayed, crowded *and* expensive commuter train can only dream wistfully of Budapest's trams or the Prague metro, so marked has been the decline of parts of the privatised UK system.

Rail systems are an example of the infrastructure, the physical skeleton of the economy. The national infrastructure includes roads, water and sewage systems, street lighting, telephone and electric cables, canals, bridges and dams, air traffic control, radio and mobile phone masts, hospitals and schools, parks, benches, art galleries and many other things. Some of these are almost always state-owned and run, others nearly always in private hands but highly regulated. They are also a subject of perpetual electoral dispute. If I never take the train, why should I want to see the government subsidize the rail network? People who are not parents think education provision is less important than health, and the elderly always want bigger pensions. However, what distinguishes all of these examples from goods and services that we'd all agree should be privately provided, run and paid for is the existence of an important externality.

Externalities can take several forms, requiring different kinds of government response. Some of these goods and services are **natural monopolies** – for example, it would be inefficient to have more than one set of streetlights down each road or more than one hydroelectric dam across a river or more than one main electricity cable into each home or more than one set of rail

tracks into a city. Replication would be either physically impossible or simply highly inefficient because there are such huge **economies of scale** (either in supply, as in these examples, or in demand as in the case of the **network externalities** involved in the telephone system, whereby having a phone is more useful the more other phones you can connect to).

Some are public goods and services whose consumption is **non-rival**: if I walk in the park it doesn't stop you doing so too, so the additional cost of an extra visitor is zero. With this **zero marginal cost** the economically efficient price is zero, and unless the place becomes really crowded it would be inefficient for the park's owner to charge me an entry fee for each additional visit. Covering **fixed costs** like buying flowers and paying a park keeper is most efficiently done through a fixed fee such as annual membership or a local tax. But determining what level that should be – what quantity of park services – is inherently collective. It depends on all the potential park-users. Parks are one example of **public goods**.

Finally, some are goods and services where individuals do impinge on each other's use but it isn't possible to prevent this. Transport and roads offer the classic example of this **non-excludability**. Often they become congested, so each additional user raises the costs for all the others, in terms of delay, aggravation, extra gasoline or whatever. Or there can be environmental externalities such as pollution. However, it is not often possible to exclude the 'excessive' users. **Peak-load** and **off-peak pricing** can distinguish between people who value their time and space most highly, like business travellers on the railways as opposed to tourists or commercial users of electricity rather than households. New technologies mean commuters can now be charged more for driving into the city during rush hour. But beyond such broad-brush strategies (whose scope is nevertheless clearly being extended and refined by new technology), users cannot be made to reveal that they value a swift journey especially highly by paying more for it. There is no mechanism for distinguishing how much value each individual puts on the service and no reason to believe the market will provide the socially efficient amount of the service.

As the examples make clear, externalities are many and varied. Technology is constantly changing what is feasible in terms of solutions. And different countries have anyway opted for different solutions.

Here are three basic principles that always apply, however.

One, the government can almost always raise large amounts of money more cheaply than private sector borrowers. Whether by raising taxes (which do nevertheless impose economic inefficiencies) or by borrowing in the capital markets, the cost of finance will be lower for a publicly-funded than a privately-funded project. This is because there is less risk involved in lending to the government as investors count on a guarantee that it can always raise taxes to pay the interest. National or federal governments rarely default, although local governments are more likely to, and the fact that government bonds are not very risky means investors will be satisfied with a lower rate of interest on the money they have loaned. So government funding of a big investment project with social benefits in excess of private benefits will often be the most attractive financing option.

Two, the government almost always runs things more badly than the private sector. The 'customers' (although more usually given a name reflecting their powerless status, such as 'patients', 'pupils', 'users' or 'claimants') can't usually withdraw their custom from a state monopoly. Nor is there any profit motive to sharpen up employees' act. Public sector staff are less well paid and consequently sometimes less well qualified and dynamic than people working in the private sector, not to mention often more highly unionised and prone to industrial action. And a business run by planners will lack the diversity and speedy information flows of a business operating in the marketplace, the nimbleness to expand what's going well and pull the plug on whatever's doing badly. The admission of mistakes is usually prevented by bureaucratic politics, not that it's ever easy in a private corporation either. In many western democracies there is also ample public sector corruption which probably has the edge over private sector corruption.

Three, wherever there is a significant social externality the government will have to play a role anyway, whether providing the service directly or regulating whoever is providing it. Think of a mixed public-private education system, for instance. Democratic government is the mechanism we have for resolving social conflicts such as those potentially created by economic externalities, for balancing the interests of drivers and cyclists, parents and pensioners, and it is by far the best mechanism for doing so. The fact that such social externalities exist explains why there are few examples of privately-financed and operated infrastructure projects anywhere in the world (although there are many examples of services that can be run successfully by the private sector as well as the public sector, and a huge amount of government subcontracting to businesses). While it is true that there is no obvious minimum level of public **ownership**, the idea

that there could be radically less government involvement in the economy at all ignores the need to balance different interests through **regulation**.

Needless to say, it can be very hard to get regulation right, as California's dire experience of electricity shortages in 2000 demonstrated. The power companies were unable to meet surging demand at the height of the first Internet frenzy, and the state suffered a series of rolling power cuts or brownouts. While the companies were clearly playing a game of brinkmanship with the state regulators, it is equally clear that the state authorities were trying to achieve the impossible: they had capped retail electricity prices at a time when demand was surging and the oil price had jumped sharply. The generating companies were simply forbidden to pass on the increase in their costs or respond in the natural way with higher prices to an increase in demand given their fixed amount of capacity. The episode is a good demonstration of the fact that regulators have to balance a lot of different and often conflicting interests, like consumers of electricity (many of them California voters) and investors in the power companies – but while California's electricity regulators were adept at the politics, good regulators must have a better understanding of the economics, too.

Regulation is so complicated that there is a huge and often inconclusive economic literature on how to do it well. But there are good reasons for opting for publicly-regulated but privately-owned utilities like electricity or telecommunications. The fact that public utilities owned by the state and run by bureaucracies provide a lousy service was one of the reasons Mrs Thatcher's Conservative Government in the UK was so committed to **privatisation** during the 1980s. In many cases privatisation did indeed improve service quality and innovation – the telephone system is the prime example. Previously Britons had had to wait weeks or months to have a phone line installed, often had to share lines with neighbours, and paid high charges. (It wasn't quite as bad as Ghana, where the waiting time for a phone from the state-owned telephone company is 75 years.)

British Telecom's first decade in private ownership brought huge successes and possibly contributed to an improvement in the whole economy's growth potential. Similarly the introduction of competition in a privatised electricity industry brought down prices paid by consumers and led to higher investment and better service quality.

Yet others saw little improvement. Some water companies found themselves unable to supply water during dry summers or maintain water cleanliness in the rivers and streams. Rail passengers found themselves treated much more politely but investment in the network fell to a literally catastrophically low level due to the lack of adequate incentives to maintain and upgrade track and signalling equipment, as a number of fatal accidents during the 1990s revealed.

Even the successes have not been unqualified, with questions now emerging over how effectively they have been regulated. For example, local telephone charges have remained high in the UK compared to the US because BT, the former state monopoly, was not forced to open the 'local loop', the natural monopoly of the last bit of wire linked to individual's homes, to competitors on commercially viable terms.

As for the failures, a proposal to **nationalize** the rail system once again would shock and alarm very few British voters. Interestingly, some water and energy utilities opted to separate the regulated parts of their business from the non-regulated parts, to raise funds more cheaply for the former and free the latter to pursue broader commercial options. Thus Welsh Water has created a non-profit water supply business, and British Gas has put its regulated gas supply business into a ring-fenced company. BT has done the same.

Privatisation is interesting because it amounts to a large-scale experiment in moving the public-private boundary. But the boundary is in a sense moving back towards where it was before. Shifting the *ownership* of utilities and infrastructure businesses, or even their *management*, from public to private sector appears to have been in some sense cosmetic. There is something special about these businesses that means they can't be just like any other private sector business.

The rail system is a good case study of the issues involved because it was the creation of the private sector and in the United States has stayed in the hands of the private sector, albeit with significant government involvement. Britain saw the building of its network in the mid-19th century, followed by all the rest of the world. There was a massive stockmarket boom in the shares of both British and overseas rail companies. Finance raised on the London Stock Exchange funded a large proportion of the initial global rail network. The bubble burst in 1848, and many investors never saw a return on the cash they had put into this hot new technology which would clearly boost economic growth in any country which developed a rail network. In fact, it was

rather like the 1999-2000 Internet share boom. Investors were voting massively with their money in an act of faith in the future. The stockmarket did what it is supposed to, and channelled finance to a high-growth sector that held out the promise of high economic returns.

In the case of rail, however, these turned out to be social rather than private returns. For example, rail allowed the development of mass urban markets because fresh food could be transported into the cities from further afield. London no longer needed a large population of cows to provide milk, but could bring the milk in by rail. But these widely dispersed social spillover benefits could not be fully captured in the prices charged for rail transportation. The profits of the rail companies were disappointing and share prices plunged.

Britain was left, however, with an extensive but low-profit rail network that was nationalized by the Labour Government after the second world war. Under public management it became decreasingly profitable and eventually came to eat up large amounts of public subsidy. In particular investment in upgrading the track and rolling stock needed to be funded by taxpayers. But the large subsidies led to cost-cutting, notoriously in 1968 when many lightly-used branch lines were closed down because more people started to be able to afford cars.

So by the time the Conservatives decided to privatise British Rail in 1996 there was an entrenched pattern of incessant cost-cutting, underinvestment, bad management and dismal industrial relations. The sale to the private sector did not raise funds for the government. Rather, it had to hand over large sums of money to entice investors to buy shares in the new rail operating companies and induce these companies to bid for franchises to operate services on the different parts of the network. A separate company, Railtrack, was created with responsibility for track upkeep and investment. Even now the government has to continue feeding large sums of money into the ever-open maw of the rail system, for without a subsidy it is clear the private companies would still not invest enough to provide the standard of service demanded by the public.

Contrast first the United States. Its rail companies were built privately, although with a not-so-hidden public subsidy in the form of favourable land deals and grants. They have always remained private. Today's operators were created by a series of mergers and operate as geographic monopolies except that they compete with the highway system. America's automobile culture, cheap gasoline, and extensive highway network, followed by its equally extensive air network, mean rail transportation has never been as important, any monopoly position never as

powerful, as in the small and crowded nations of Europe. Its additional social benefits are much smaller than in the European case. In fact, if history had turned out a bit differently and the technology of the internal combustion engine had come before the technology of rail transportation, the railways might never have been built in America.

Contrast, too, Continental Europe, where no government has ever imagined it made sense not to subsidize the rail network in order to provide the service the public wants. With less land, crowded urban roads and lower levels of income, there would probably always have been railways in Europe even if roads and cars had been around at the same time. Now most European countries have clean, fast trains, plentiful investment, and an extensive network that could never make a commercial profit but keeps all inhabitants within easy reach of affordable rail travel. Rail privatisation has never been on the agenda on the Continent.

Britain's characteristic mid-Atlantic position is clearly uncomfortable. Should it now head in the American direction, and settle for a small but perhaps ultimately profitable private rail system? This would not reach all of the country and would probably be even smaller than today's network. After all, the profitable services are those taking commuters into cities and those connecting big cities. Some of the freight, as well as passengers, currently transported by rail would shift to the roads.

Or in the European direction? That would involve the recognition that a bigger and more comprehensive network will always need a public subsidy because the private return is smaller than the social benefits, in which case either public ownership or detailed government regulation of the service quality would be inevitable. British voter preferences seem to point to the European solution. That certainly seems in line with my argument that the social benefits of a rail network are higher when alternative means of transportation like the roads, for unavoidable reasons of geography and history, do not compete directly with rail. Britain, too, is a small and crowded country with as many roads as it is ever going to have. Driving has a high private and social cost.

This highlights a broader point. The public-private boundary will always be fluid. It starts from where it is in each country anyway: the legacy of history is inescapable. The term often used to describe this is **path dependency**. But in addition technological change will shift the boundary over time. For example, mobile telephones have made fixed telephony look less like a natural monopoly; in Africa there have been since 2001 more mobile phones than fixed lines in use

because the new technology has allowed people to escape the clutches of inefficient state-owned fixed line monopolies. Smart cards and electronic monitoring have made it feasible to exclude some drivers from the roads at certain times. Faxes and email created new forms of competition with the old postal monopolies. The social benefits of one service could also change for other reasons, perhaps changing assessments of environmental spillovers or the provision of an alternative public service like better roads in the case of the rail network.

Where to draw the boundary between pure private sector activities and those requiring public involvement through ownership or regulation is one question. How to manage publicly-owned services or regulate privately-owned ones involving social externalities is a separate question. Whether it is electricity regulation in California or telecoms in Britain, there are vast pitfalls in setting up a regulatory structure. There is no perfect answer because the provision of services involving big externalities necessarily involves multiple aims and inescapable dilemmas. What's more, despite the vast research carried out on the subject, we do not yet have any systematic appraisal of what kinds of institutional designs work well for publicly-managed and regulated services, and which work badly.

There have clearly been some big successes in privatisation, where big gains in efficiency mean consumers are paying less for a better service. Examples include telecommunications in many countries, gas and electricity in the UK and Sweden, water supply in France, and many industrial corporations once owned by European governments engaged in businesses ranging from insurance to oil. The successes have also depended on subsequent good regulation of the industry, as in energy and telecoms.

Despite the favourable examples, Britain's privatisation experiment tried to answer the second question, about how to run utilities well, with a solution to the first question, about the location of the private-public boundary. It has been overall only a partial success, although where it has succeeded it has outperformed nationalised industry by a long way. The lesson might well be that some externalities are just too big for the private sector to handle, and will always require government financing through taxation to provide the necessary infrastructure and services.

Chapter Eight

Energy taxes: Industry 5, Environment 1

Economics is often described as the dismal science but nobody can beat environmentalists for gloom. Predictions of disaster and crisis are their *raison d'être*, because an impending crisis is what makes people pay attention to the environment. Economists are relentlessly upbeat by comparison. They believe metaphorical time bombs, whether environmental, demographic or anything else, never explode because human societies and economies adjust in response to pressures.

A famous example of this contrast between environmental pessimism and economic optimism was a 1980 bet between Paul Ehrlich, a biologist and an ardent environmental campaigner, and Julian Simon, a famously free-market economist. The dawn of the modern environmental movement was perhaps the publication in 1968 of a study by Ehrlich called 'The Limits to Growth' which predicted that at the prevailing rates of depletion the world would run out of non-renewable natural resources within a century, at which point the economic system would collapse, there would be mass unemployment, starvation and a soaring death rate. What's more, even if more resources were found, doubling known stocks, the resulting growth would lead to unmanageable pollution, economic and social collapse, mass unemployment and so on. This approach was then given a tremendous boost by the huge jumps in the oil price in the early and mid-1970s. It was a commonplace by the end of the decade that the world's oil reserves would run out within 50 years.

So Ehrlich was confident he would win the bet with Simon that the prices of five metals would be higher, adjusted for inflation, in 10 years' time. He chose a \$1000 combination of \$200-worth each of copper, chrome, nickel, tin and tungsten.

The specified prices in fact more than halved between 1980 and 1990 and the \$1000 combination would have cost less in 1990 even without making the inflation adjustment. The value of the \$200 components ranged between \$56 and \$193. Erlich sent Simon a cheque for \$576.07, protesting that such a specific wager was not really meaningful. One of his arguments was that demand for some of those particular commodities had fallen – which was exactly Simon's point.

The two men had agreed that if demand for a commodity grows far faster than supply, the price will rise. The environmentalist stopped there. The economist's argument, so conclusively proven by the bet, was that people would adjust their behaviour in response. Higher prices in themselves would choke off some demand. They would induce suppliers to produce more – mine more ore or search for new reserves – because formerly unprofitable production would now be profitable. And it would also induce other profit-seeking entrepreneurs to try to find substitutes for the scarce commodities, introducing new technologies. Thus copper was replaced by glass fibres in telephone cables, cars no longer incorporated lavish chrome fittings, and so on. While specific commodities might be in limited supply in the short-term, in the longer term human adaptation and ingenuity makes the supply of resources effectively infinite.

So for all their often-irritating claim to a monopoly of the moral high ground, environmentalists are not always right. In fact, I'd even say that usually they are not right. Most are guilty of having no understanding at all of basic economic principles, and caring less than they understand, a lack which makes many of their policy prescriptions doomed. But that doesn't mean that they are always wrong, either. After all, the balance of probabilities is that significant climate change is taking place as a result of human activity, particularly CO₂-emitting energy use. There is too much pollution, damaging human happiness and health. A good deal of economic innovation has gone ahead with its environmental impact no more than an afterthought. In short, the economics profession had certainly overlooked important **environmental externalities** caused by much economic activity, until the green movement set the subject alight.

It is ironic, then, that pollution is one of the conventional textbook examples of an externality. A factory emitting pollutants as a side-effect of its production imposes costs on other people in excess of anything it might cost its owners, and which the owners do not have to pay themselves. So for example dirty air that triggers many cases of asthma will drive down property prices around the factory, making home-owners pay for the pollution. Households and all other businesses in the area will pay in higher charges for the costs of cleaning water extracted from polluted rivers and aquifers. The guilty factory's share of the clean-up cost will be tiny. Because it does not pay the external cost it over-produces pollution, whose costs it then passes on to consumers.

It isn't just factories and power stations that pollute. All households discharge vast amounts of waste, and individual drivers plenty of emissions. There is noise pollution from aircraft flying overhead or builders playing loud radios. The residents of Tucson, Arizona have complained about light pollution from electric lighting at night. Any of us can impose **external costs** on others by going to places that are already busy, adding to the congestion of a traffic jam or crowded art gallery.

There is also another well-known **market failure** affecting the natural environment, the **tragedy of the commons**. Why are certain kinds of ocean fish stocks dangerously depleted when there is no shortage of chickens? The answer is that the fish are owned in common whereas chickens have individual owners. If a world dictator owned all the fish in the sea, she would have every incentive not to over-fish in order to conserve supplies for future sales. The price charged would be higher reflecting the investment in non-depletion of a resource that is not in **perfectly elastic supply**. But no individual fisherman has an adequate incentive not to over-fish because their individual contribution to the problem is tiny. If one or a few were to reduce their catches voluntarily, it would make little impact and would be vulnerable to all other fishermen **free-riding** on their restraint.

Governments therefore have to get involved and set quotas for each nation's fishermen, but even that is inadequate because governments battle for the national interest not the global public interest. Eventually fish shortages mean the price mechanism kicks in, higher prices reducing consumer demand. But ideally prices would have been higher all along to reflect the **social cost** of depleting fish stocks.

Environmental externalities are pervasive. There is no market for clean air, or quiet and uncrowded streets, or species diversity. (How much would you pay to preserve a particular species of rainforest insect?) Few governments collect data on the scale of the externalities either. The UK's official statistics agency, like one or two others, does publish an annual "satellite account" attempting to measure a variety of environmental impacts, but more data and further refinement are needed. Environmental policy is severely hampered by the absence of reliable and meaningful data.

So how should a concerned government tackle such externalities? It could ban emissions of various pollutants above a maximum level. Setting the right level is tricky. A total ban would

often impose economic costs that were out of all proportion to the cost of the environmental externality. For example, only nuclear power stations can currently generate totally emission-free power at a price most consumers would find acceptable so a ban on CO₂ emissions would require amongst other things building many new nuclear power plants. Then all vehicles with internal combustion engines would have to be replaced by vehicles fuelled by hydrogen cells, and a network of refuelling stations built in place of existing petrol stations. And so on. This is an extreme case but illustrates the costs of this approach. Still, direct regulation is one solution.

Economists tend to prefer an alternative approach which clearly causes the polluter to internalise the external costs and brings the power of market forces to bear on the problem. This is the use of so-called **economic instruments**, or in other words taxes, subsidies and tradable permits.

Take the example of a government that wishes to reduce emissions of greenhouse gases by its businesses and consumers, as required by the Kyoto Protocol of December 1997. Individual countries committed themselves to reductions of up to 30% in CO₂ emissions compared to what they would have been on existing trends. (The average reduction was 11.5% for the EU compared with 24.5% for the US. Little wonder George W Bush backed out of the agreement, to the outrage of Europeans, as one of his first Presidential decisions.)

The countries that signed up agreed on an innovative emissions trading scheme. Companies would be required to set legal targets lower than current levels of emissions, but if they managed to reduce the level below the target they could sell the excess to a company that had not managed to meet its target. The price for the additional emission permission would be set by the market. The biggest reduction in emissions would occur where it was cheapest and allow the overall global target to be met in the most cost-effective way. The Kyoto scheme was based on the successful model of a sulphur dioxide trading scheme operating in America since 1995 as part of the Acid Rain Program and a scheme for trading nitrogen and sulphur oxide permits in Southern California.

America pioneered tradeable permits. European governments have in the past tended to stick to taxation. During the 1990s nine either introduced or proposed some form of energy tax designed to raise the price of energy to reflect the cost of the CO₂ and other greenhouse gases incurred in its generation. Norway, Sweden, Finland, Denmark, Austria and the Netherlands went ahead with an energy tax first, followed by the UK (where it was called the 'climate change levy')

in a doomed bid to make it more popular with the businesses forced to pay it) than Italy and Germany.

Introducing a climate change energy tax has three advantages. It works through the price mechanism and is therefore likely to be more efficient, less distorting, not to mention easier to operate than direct regulation, although setting the tax at the efficient level is a challenge. It can encourage companies to adopt more energy-efficient methods over time. And thirdly, as a supplement, it can signal to companies that they need to take this environment business seriously in planning their long-term investments.

There are two ways to go about taxing energy. The tax could be applied to energy use by businesses and domestic consumers, so much per kilowatt hour of electricity used. Or, for politicians shy of taxing every voter's electricity bill explicitly, it could be applied to suppliers of energy for passing on indirectly to final customers. This second type, known as a 'downstream' tax, would also be easier to administer as there are fewer distributors than final users of electricity. On the other hand, with lower visibility it might have somewhat less impact in altering consumer behaviour in favour of energy conservation. The rate of the tax could be set differently for the different fuels used in energy generation, to reflect their varying carbon contents, as it is the CO₂ that's the chief greenhouse effect culprit.

The UK's version was applied only to industrial and commercial companies, by-passing domestic energy use. Imposing a tax on home fuel bills was a complete non-starter politically. The Labour Government had, in opposition, humiliated its Conservative predecessor by overturning such a tax on the grounds that it was grossly unfair. Poor households spend a much higher proportion of their budget on energy than rich households do, and a domestic fuel tax is highly **regressive**.

The restriction on the energy tax nevertheless caused great bitterness amongst companies, even though the revenues were handed back through a reduction in other taxes on business. After all, domestic energy consumption exceeds manufacturing industry's use and amounts to about a third of total national energy consumption. The most intensive industrial users of energy thought it was outrageously unfair that they would pay most and demanded a special exemption to reflect their extra energy needs, rather missing the point that the aim was to discourage such intensive

energy use. One sad case I know of was a local steam museum, which had to raise entry charges for visitors to see its fantastic 18th and 19th century steam engines in operation.

The energy industry in the UK would rather have seen a US-style permit trading scheme. So would the investment banks in the City of London which really liked the look of a new market to operate. But with no experience of such schemes, and lacking the instinctive American preference for market solutions, most European governments hesitated about introducing tradable permits. However, the EU did introduce a trading scheme in January 2005, which has operated with mixed success. The main practical pitfall has been deciding what level of permits to give the participating countries. Governments have tended to be over-generous as a result of being lobbied by industry, and also to give free permits to new participants in the system, so the trading scheme has been awash with permits, leading to too low a price for CO₂ to have any effect on incentive to emit carbon dioxide.

Another example of an environmental tax is duty on gasoline or petrol. The rates of duty vary widely between countries, from 22 % of the wholesale price in the US, 58 % in Ireland (the next lowest amongst developed countries) up to 76 % in the UK. In October 2000 truck drivers brought Britain to a standstill by blockading gasoline depots in protest at continued planned increases in fuel duties, which won them a freeze in the following year's Budget. But another tool used by the government has been the introduction of lower rates of duty for 'cleaner' varieties. For example there is currently a three pence per litre differential between the duty on ultra-low sulphur diesel and ordinary diesel. An initial differential of one pence per litre introduced in 1997 was too low for the oil companies to be bothered with refining the cleaner fuel, but soon after its increase to three pence in 1999 the ultra-low sulphur share of the diesel market jumped from well under 20 % to 100 %. The Government was encouraged to increase duty differentials for other types of fuel including liquid petroleum gas and compressed natural gas as a result, and will also encourage a switch to ultra low sulphur petrol for non-diesel engines when cars able to use it are available from 2002 or 2003.

The most powerful environmental tools are those where it is possible to identify an externality and design a tax or other instrument that will address the distortion in the market directly. Indirect approaches are bound to be inefficient. To take one instance, many campaigners argue that free trade is not all its cracked up to be because it ignores a variety of environmental costs, notably the energy used in transporting goods long distances around the globe. The free

trade regime is also criticized for encouraging companies to switch production to developing countries where pollution standards are much weaker. There have been terrible examples of multinationals operating at lower standards overseas, like the notorious accident at a Union Carbide plant in Bhopal.

So environmentalists would like to see less trade, or at least minimum environmental standards written into trade agreements. But trade brings economic benefits to consumers and restricting trade therefore means some of these would be lost: there could be a large **opportunity cost**. What's more, free trade will tend to shift production to the most resource-efficient locations, and lead to the most productive, least costly use of natural resources at the global level. If it is nevertheless correct to say the use of energy in transportation imposes a social cost through the emission of greenhouse gases which is not reflected in the cost of transportation, the right policy is to raise the price of energy by taxing it. This tackles the externality without imposing additional and unknown economic costs by restricting trade.

In general, environmental problems need environmental solutions, not trade solutions or investment solutions. What's more, economic tools can offer powerful levers on environmental problems. It's rare however to find environmentalists campaigning vocally for higher energy taxes. They know how unpopular these are with voters. In America even more than Europe cheap energy is one of the basic demands of the people. After all, politicians in California would not allow power companies to charge a retail price for electricity that increased in with the costs of generating it when oil prices jumped in 2000. The same year truck drivers across Europe blockaded gas stations and depots when higher oil prices drew attention to high taxes on gasoline sold at the pump. This means environmental campaigners have opted for softer political targets such as free trade, on which they can ally with unions protecting jobs and industry lobbies. It's altogether easier, but it does indicate that the green campaigners have failed to convince the public on their fundamental argument that humanity is using too much energy.

Sadly, the economic arguments do not often win friends. They spell out harsh choices too clearly. To take another example, one of the stumbling blocks in the Kyoto climate change agreement has been how much developing countries need to contribute to reductions in emissions. They argue that the rich industrial countries are responsible for most global emissions of greenhouse gases and should bear the main burden of reduction, because to make the poor countries reduce their emissions from current levels will prevent them ever industrialising and

reaching the standards of living enjoyed in the west. To developing countries, this is unacceptably hypocritical. However, on the other side of the fence, it looks essential to prevent the billions of the world's poor in the years ahead from contributing to similar high levels of emissions.

There is an economic solution to this apparently insoluble dilemma: tradeable emissions permits. Allocate a certain amount of allowed emissions to every country through international agreement, adding up to a global total that shrank year by year - diplomatically thorny but possible. Poor countries could then choose between increasing the amount of polluting economic activity they undertook or selling the right to emit to a rich country which would then have to struggle less to cut emissions. The poor country would be better off either way and worldwide emissions would be on a downward path. However, many environmentalists seem to believe any use of the market mechanism is intrinsically immoral. When a World Bank research paper suggested a similar idea, whereby polluting industries relocated to developing countries, it caused complete outrage in the environmental movement.

Yet it is what is in effect happening as western manufacturers switch production to East Asia or Latin America, mainly because of cheaper labour but also perhaps partly because it's cheaper to pollute to the extent that developing and middle countries have weaker regulation on emissions. The nations with a stronger preference for clean air get it, and those countries that prefer more industry get that.

Indeed, there is a very strong relationship between levels of GDP per capita and indicators of environmental quality such as air and water quality and pollution levels. Rich countries are cleaner. That is surely because public concern for the quality of the environment in general grows when most people do not have to worry about food and shelter. Of course there are severe environmental pressures in developing countries such as a lack of clean water or soil erosion or extreme weather conditions, and many also have industries that are less energy-efficient and more polluting than those with high technical standards in the west. It is possible that the quality of the environment might get worse before it gets better for countries just setting off on the path of economic growth. But environmentalism itself appears to be a luxury good, one people demand more of as their incomes rise. Economic growth in the developing world, so that there are many more prosperous people, is likely to be a requirement for the adoption of better environmental standards in those economies. If so, campaigners from the rich parts of the world

will fail if they try to make higher environmental standards a precondition for graciously granting poor nations permission to grow.

Will such arguments make much headway with environmentalists? I doubt it. The basic philosophies of economics and environmentalism are too different.

Economics is empirical, searching for policy prescriptions that deliver measurable benefits. What matters is what works. Of course it is highly ideological too, but it is a way of thinking about the world derived from the questioning, sceptical methods of the 18th century Enlightenment. A good economist keeps an open mind.

Environmentalism is a descendant of the 19th century Romantic reaction to this rationalist approach. It is idealistic, not sceptical. Some of its beliefs are therefore dogmatic (to the economist, at any rate). One example is that the use of pesticides is always bad, according to environmentalists. Why? Because they leave carcinogenic traces on the fruit and in the soil and groundwater. But they also make fruit cheaper so people can buy more, and that might reduce the incidence of cancer. To an economist it's an empirical question in the end: are the relevant cancer rates actually rising or falling, and is the incidence correlated with use of the suspect pesticides? Are there other potential causes of these types of cancer? What are the numbers? The environmentalists might be right but they must demonstrate it using epidemiological evidence, not assert it. Similarly, recycling paper and glass is always good, according to dogma. Well maybe, but plentiful supplies of cheap recycled material means paper and glass manufacturers have less incentive to plant trees or develop alternative means of packaging.

Humanity will inevitably have an impact on the planet. Ensuring that the impact is as beneficial as possible is genuinely complicated. The fundamentalist environmental approach which says any human impact is an unacceptable cost imposed on nature is equivalent to an argument for zero economic activity. Even less extreme green views can have significant implications for all of us as consumers, although these are hardly ever spelt out.

There is always an opportunity cost in any course of action. If economic activity has often ignored environmental costs, environmentalists often ignore the economic costs of their proposals. There are such costs even in the most innocuous of cases. Cycle or walk instead of driving? That imposes costs of time lost doing other things.

Romantic ideals versus rational choices? I can't see either side converting the other. But like many other economists I do care about the environment so I hope that governments do base their environmental policies on sound economics. And I would happily pay an energy tax.

Chapter Nine

Auctions: call my bluff

In 1990, just as the late 1980s boom had started to wane, a painting by Vincent Van Gogh, the *Portrait of Dr Gachet*, achieved the highest price then ever paid at an auction for a painting, \$82.5m. If you are not put off by the likely price tag and want to buy a painting by one of the Impressionist masters, you will probably have to bid for it in an auction, one of those intimidating events at a smart auction house like Christies or Phillips where a suave chap wielding a hammer starts the bidding at some figure in the millions. Auctions are a long-established way of selling rare things that have competing potential buyers.

Auctions have also been long used by many governments for selling Treasury bonds, the financial instruments issued to cover government borrowing. These are downbeat events rather less glamorous than the art house auctions, often just involving the faxing of documents. New kinds of auctions have become extremely fashionable in economics because of broadcasting and mobile telecommunications. The radio spectrum is a great example of a valuable asset in limited supply, just like Impressionist paintings.

Some countries started auctioning licences to parts of the airwaves as early as 1989 – the UK, New Zealand, Greece and India were pioneers. However, these were either modest successes or politically-embarrassing flops. Auctions did not start to take off until, in July 1994, the United States Federal Communications Commission allocated 10 nationwide licences for ‘narrowband’ personal communications services (PCS) in an auction designed by economists. A much bigger auction of 99 broadband PCS licences which took place between 5 December 1994 and 13 March 1995 was a huge success, raising \$7bn. By 2001 the FCC had raised over \$32bn for the government from 32 auctions of radio-spectrum licences. In recent years governments everywhere have started following the example of the American authorities in auctioning licences to telecommunications companies – and, increasingly, taking advice from economists about how to design the auction process.

The record of the spectrum auctions around the world is both mixed and controversial. Some have raised a surprisingly large amount of money for the government, others surprisingly little. Some have resulted in a vigorously competitive market, others have created monopolistic markets damaging to consumer interests. Governments prefer the first kind of auction in each

case, companies the second. The controversy is inevitable because what's for sale is the right to the stream of income that will result from ownership of the rare asset, known as an **economic rent** like the rent property owners receive from tenants on their land.

One of the most controversial of the recent auctions was the British government's sale in March-April 2000 of licences to use parts of the radio spectrum for so-called '3G' or third generation mobile phone services. All the European auctions of that year involved the 3G technical standard, UMTS, because the governments sought the advantages of a common standard across the continent that had been so fruitful in earlier generations of mobile telephony.

For the British taxpayer the auction of five licences was without doubt a huge success. It raised £22.5 billion, more than 5% of one year's total public expenditure and enough to build 400 new hospitals. The two academics who had led the team designing the auction were fêted in the press, an unusual and heady experience for any economist.

The auction took place at the peak of the bubble in enthusiasm when share prices were high for technology companies, but before long there was a backlash as the companies grumbled that they had spent so much on the licences that they had nothing left to invest in the service. This wasn't a novel experience: the estate of Ryoei Saito, the Japanese magnate who had bought the Van Gogh at the height of an earlier investment boom, had to dispose of it at a much lower price after his death. The telecoms companies warned that because of the expense of the licences, customers would have to pay more for their mobile calls. Worse, some experts started to warn of flaws in the 3G technology and predicted it would be overtaken by something better before the infrastructure had ever been built. One technology expert (who had for a long time worked for BT, the UK's dominant and former state monopoly phone company) described the auction as "a really good study in madness". Well, having spent so much money, the companies' moans have to be taken with a pinch of salt. They might be right to predict 3G phones will never take off (although 3G services are growing faster now, seven years on), but if so it will be due to the technology, not the economics. To see why, we need a brief overview of auction theory.

If the government wants to do something like allocate licences, it could ask companies to submit proposals and business plans, and choose whichever look best in its judgement, best for customers in the years ahead, yet commercially viable. This is known as a **beauty contest**, for obvious reasons. Or it can hold an **action** intended to use the process of bidding, which reveals

what the rivals think the business is worth, to determine the best companies to run the service. Politicians tend to like beauty contests because it gives them more discretion, but this is precisely why ever-sceptical economists tend to prefer auctions.

There are many different ways to design auctions, but two classical kinds. The art house type is an ascending bid auction, with successive rounds in which participants know everybody's earlier bids. The UK 3G licence auction was of this form. The other kind involves an irrevocable sealed bid where nobody knows what the rivals have offered. But there are many variants, for instance depending on whether bidders pay separate prices or uniform prices. For example, in many Treasury bond auctions, all successful bidders pay the individual prices they offered for the quantity they bid for (a discriminatory auction). In other circumstances, all bidders pay the price set by the lowest winning bid (a uniform price auction), which is often used in markets auctioning many units of a standardized item like electricity.

The different approaches all have their pros and cons. An auction with successive, open rounds of bidding makes it easier for companies to collude with each other. They can use early rounds to signal their intentions. For example, a 1997 US spectrum auction that had been expected to raise \$1.8 billion only brought in \$14m. Part of the explanation for the startling shortfall was that bidders turned out to have used the final three digits of their multi-million dollar bids to indicate the identification numbers of the areas they wanted the licence for. Such collusion is impossible in a sealed-bid auction.

Ascending auctions of successive rounds have another drawback. It is a fair bet that the auction will be won by the firm that values winning the most. In fact, that is precisely the great upside of an ascending auction, making it the best at generating both higher government revenue (as long as there is no collusion) and productive efficiency. However, this makes it less attractive for other competitors to enter the bidding. It might even make the auction unattractive to the company most likely to win, because if it does it might have the sneaking suspicion it has overpaid for something nobody else valued as highly. What if it has got its view about future revenues completely wrong? This is the notorious **winner's curse**.

In practice, the winner's curse does not seem to exist, which makes sense. After all, bidders are well aware of the possibility. Awareness of the danger of the winner's curse can mean participants bid very cautiously, resulting in a low sale price. This is especially true when the

bidders know one of them has a genuine advantage. For example, in the 1995 auction of the Los Angeles broadband mobile phone licence, Pacific Telephone had a well-known local brand and a database of potential customers because of its fixed-line service. There were other bidders, but the bidding stopped early and the price was low. Everybody knew the licence was genuinely worth a bit more to Pacific.

The winner's curse operates in sealed-bid auctions too. However, the extra uncertainty in this type means weaker bidders – smaller companies, firms that are not already incumbents in the industry, foreign companies – stand a better chance of winning. So potential entrants will be more willing to participate, which is an important consideration for a government trying to boost competition in the industry.

So ascending auctions can raise more revenue and award the prize to the bidder who values it most. On the other hand they are more prone to collusive behaviour and are less attractive to new entrants. Sealed-bid auctions have the opposite characteristics. Auctions that combine elements of both, known as Anglo-Dutch auctions, get the best of both worlds. These involve rounds of ascending bids until only two bidders are left, and then a sealed-bid playoff where the bids have to be not lower than the top price reached in the earlier rounds. This generates high revenues and encourages competitors who know the play-off gives one of them some chance of beating the most advantaged bidder.

However, governments can also influence the competitive structure of the industry in other ways. In the telecoms case, for example, the number of licences to be awarded is a key weapon. One option is to auction small chunks of spectrum which winners could then trade to amalgamate into viable larger licences. This has the merit of being a market solution. Unfortunately in a high fixed cost network industry like telecommunications, the market solution is likely to be overly monopolistic from consumers' point of view, with too few competitors left in the market. An alternative, chosen by the UK in the 2000 3G auction, is to issue a number of licences that exceeds the number of incumbents in the industry and limit bidders to one each. This guarantees a new entrant.

Yet every situation is different, demanding tweaks to the auction design. The Dutch government, auctioning the same type of licence a month after the UK, copied the auction design in the important details, including issuing five licences. Unfortunately, the Netherlands already

had five incumbents, not four. This was a crucial error. The potential new entrants knew they probably wouldn't win alone so formed partnerships with the incumbents instead. The auction raised just £1.65 billion rather than the £6 billion the Dutch government had anticipated based on the UK's experience just a month earlier.

A similar German government auction opted for selling off smaller bits of spectrum and allowing the market to decide on industry structure. The seven bidders had a choice: the dominant ones could push prices high, generating a lot of revenue for the government but leading to a more concentrated industry, or they could settle for smaller licences at a lower cost but with more competitors. The government got lucky because the companies made a mistake: it got high revenues and a six-firm mobile phone market. The dominant bidders pushed prices up in the auction but then didn't bother to push the weaker firms out. As one of the UK's auction designers observed: "It is hard to construct beliefs about opponents for which this is rational behaviour." Like other fields in economics, auction design assumes rationality, which is obviously sometimes over-rated.

To go back to the original question, then, was the UK 3G auction a success or not? The government raised a lot of money. It created a market with five strong competitors. But was the result flawed by the winner's curse?

The argument for an auction rather than a beauty contest was that the government and its expert panels would have no idea about the value of a 3G telephony licence, whereas the companies providing the service would be able to value it. But in a fast-moving area of technology, perhaps there's no reason to expect corporate executives to have any clue either (although the market should know better). At best, they might have a handle on the relative value of the different licences on offer.

In that case a beauty contest combined with a regime to tax future profits might have done better at generating not only incentives for companies to carry on investing but also high government revenues. The government would then have chosen the lucky winners but guard against them having underpaid for the privilege by taxing high profits in later years. This has proved the case with the licences for oil and gas exploration in the North Sea for the past quarter century, the main example cited by fans of a profits tax. They were allocated at low cost in a

beauty contest, but the accumulated tax revenues amount to £250 billion, or more than 4,000 new hospitals, in today's money.

There is a difference however between oil exploration licences and spectrum licences that makes the parallel inexact. The price of oil is set in a world market, and the North Sea tax regime doesn't affect the price the oil companies can charge for the oil they extract there. The world price means it is straightforward to calculate the profits that should be liable for tax. This is not true in a national telecoms market where companies set prices and have some power to simply pass on tax to customers.

There is anyway little doubt that the telecoms companies would have moaned just as much if they had faced, instead of the spectrum auction, a special tax on profits from 3G mobile telephony. The right comparison to make for policy purposes is not auction versus beauty contest but rather auction versus beauty contest with profits tax. In fact, I'm sure the moans would have been the same: that it would raise costs for consumers and discourage new investment in an industry for which incentives to innovate are the life-blood.

It is hard to escape the conclusion that the telecoms companies are just fed up that the government insisted on a transfer of economic rent from corporations to taxpayers. After all, in the UK the telecoms companies were used to not having to pay much at all for licences to use the radio spectrum. In the US numerous auctions have generated government revenues on the same sort of scale as the 3G auction but the companies are used to it so there is little fuss about it any more.

With five operators in the UK market it is hard to believe the telecoms companies can carry out their threat to pass on the licence costs in higher prices or to cut back on investment. As the FCC points out in its assessment of the US experience, if the investment is economically worthwhile, it will take place anyway. The only possible risk is that if the company that first bought the licence goes bankrupt there will be a delay before somebody else incurs the cost of investment. The UK telecommunications market is just too competitive, and 3G mobile telephony is also going to be competing with conventional fixed lines, old generation mobile services, and new technologies such as local and short-range wireless services (including 4G and Bluetooth).

Similarly, the Channel Tunnel never managed to recover its huge sunk costs because of competition from the cross-Channel ferries. The operators of services through the tunnel can only charge what the market will bear. It was the shareholders in Eurotunnel, the company which built the tunnel, who had to pay the price. Or to take a more prosaic example, the rent for an apartment depends on demand and supply in the area, not on the amount the landlord paid for it in the first place.

It will be shareholders in telecoms companies who pay for the 3G mistake, if it does turn out to be a mistake. For we don't know yet whether the technology is going to be a success or failure. It makes me rather suspicious that doubts about 3G technology began to emerge in the press, doubts raised by the companies that had just spent a fortune on it, a matter of weeks after the auction took place, and in the run-up to a general election. If that wasn't an industry lobbying for a improvement in the terms and conditions of the licences, I'm an Impressionist painter.

Making mistakes is actually rather the point about running a high-technology business like a telecommunications company. It involves taking technical and commercial risks. Risk-taking is for businesses, and investors, not for taxpayers. Perhaps the mobile phone companies got this particular judgement wrong. But even if they did, it is no reason for taxpayers to subsidize the next risk they take. Governments are right to opt for auctions that make companies pay for valuable licences. Auction design is a fast-moving area of research, and it is clear that in the past some auctions have worked rather well, and others have not. Still, in principle and in practice, auctions save the taxpayer money and, if the design is right, they can help consumers too by ensuring competition in markets that are vulnerable to the exercise of monopoly power.

Chapter Ten

Tax incidence: Only people pay tax

Tax is never popular. Nobody likes the chunk the government takes out of their paycheck, or the way a sales tax increases the amount they have to pay at the checkout. So politicians do their best to sugar-coat the pill. Income taxes are so visible that they are rarely raised. Sales and property taxes are unpleasantly obvious to shoppers and home owners too. Easier by far to increase the taxes that are not paid by individual voters such as corporation tax or business property taxes. This electoral logic means there is a vigorous corporate lobby against a higher tax burden on business. Vigorous but economically illiterate because businesses don't pay tax. People do. Different people depending on which tax you're talking about, although working out exactly who – the **tax incidence** in economics-speak – is sometimes difficult.

There are countless examples of how business taxes fall unnoticed on unexpected groups of people. For example, in 1997 the British government raised a lot of money by abolishing a tax credit that pension funds had been receiving for the tax withheld on dividend payments by companies in which they held shares. This is so complicated just to write down that it is easy to see why there was absolutely no fuss about the move. Who could care about some change in the tax rules for big investment funds? But what it meant was that the contributions people were making to their savings for retirement, invested by the pension funds, were suddenly being taxed at 23%. A few years on, when they were being advised by their accountants to boost their savings substantially to make up for the shortfall, the penny dropped.

The incidence of many business taxes depends on the kind of market involved. The key is how sensitive demand for and supply of the product is to price changes. The **elasticity of supply** and **elasticity of demand**, in other words, determine how much prices paid and quantities sold change when a tax is imposed. Companies will generally be able to pass on some portion of the tax to consumers, just as they do their other costs. If demand is highly elastic so that sales drop off sharply when price goes up, they will be able to pass on less of the tax to customers than if demand is inelastic. Demand for cigarettes is inelastic because smokers are addicted but demand for apples is elastic because apple-eaters will switch to pears if apples go up in price. Companies will also be able to pass on less when supply is highly elastic, that is, increases a lot as price rises. This will be the case in very competitive markets, such as hairdressing, with many companies eager to win customers. In less competitive markets, by contrast, businesses may be more able to

restrict supply to keep prices high, and more able to pass on a high proportion of a tax to their customers.

Thus pure monopolists could if they chose easily pass on a tax on their revenues straight to their customers, who might buy less but have nowhere else to go for what they do buy. In a competitive market, companies will find it hard to pass on an increase in taxation by raising their prices as that would bring in competitors. In that case, lower profits will mean lower dividend payments to shareholders because profits will be affected. Or the company could decide to try to cut other costs, perhaps spreading the tax burden to employees by firing some of them or cutting pay, or to suppliers by negotiating a lower price with them. Customers, shareholders, workers pay – all of them people of one kind or another.

Failing to understand tax incidence has led to some spectacularly flawed policies. More flawed than most was the 1998 settlement between the US states and cigarette manufacturers, painted as a great victory for American non-smokers, for smokers who might fall ill and above all a justly severe punishment for the corporations.

On the face of it this has nothing to do with taxation. It's about hammering the big, bad, purveyors of death, surely? Wrong. This is where the belief that companies, not people, can pay tax disguises the identity of the real losers. The tobacco settlement is a superb example of how important it is to think through the presentation of almost any piece of news to see what it really means. It's also a good case study for understanding tax incidence.

In a piece of deliberate obfuscation, what amounts to a new national tax increase of about 35 cents on a pack of cigarettes, has never been described as such, but always rather as 'damages' or 'settlement payments'. However, the deal, imposing an apparently staggering \$206 billion bill on the cigarette makers, amounted to a tax which will be paid by smokers – the very group supposedly being compensated by the settlement. Just \$2.4 billion was to be paid upfront by the tobacco firms (split between them according to their stockmarket valuations rather than any assessment of their relative guilt in killing and harming smokers).

How could this be? Well, it was in nobody's interests to admit the truth. The states had every incentive to appear tough on the tobacco companies. The companies could pretend to be feeling pain when in fact they had sold out their customers in return for protection from a major

category of lawsuits (the states' Medicaid suits). And the lawyers involved got fees amounting to \$750m a year for 5 years and \$500m a year indefinitely, payments estimated to have a **present value** (that is, added up and given a higher value the sooner they are received because people value getting money sooner rather than later) of \$8 billion. (At one point during the debate on a proposed 1997 Federal tobacco settlement which subsequently collapsed, the Senate set a \$4,000 *an hour* cap on legal fees, but that soon got overturned.)

In effect, the deal okayed a **collusive** price increase by the cigarette manufacturers in order to get consumers to fund their settlement of the lawsuits, to the benefit of the lawyers, plaintiffs and defendants (especially the lawyers). It was possible because the cigarette market is a tight **oligopoly** dominated by four companies which between them account for 98.6% of sales, a fifth with 1.3% and about a hundred with 0.1% of the total market between them. After all, it's a hard business to break into. Advertising is severely restricted, banned on radio and TV since 1971, and you can imagine the public outcry if a new would-be competitor announced plans to branch out big time from cake mixes or fizzy drinks into cigarettes. As a result it is an obscenely profitable industry, albeit one with a shrinking US (and European) market. Profits as a proportion of sales revenue for the big four (Philip Morris, RJR, UK-owned Brown & Williamson and Lorillard) ranged from 26% to 45% in 1997, the year before the states' settlement.

What's more, smokers are addicted so the **price elasticity of demand** for cigarettes is low. Higher prices squeeze off some demand but not much. They are even hugely loyal to individual brands, depending on which appeals to their self-image. Only about one in ten switches brands each year.

With such inelastic demand, the industry would be even more profitable if the companies could co-operate fully in fixing prices. Of the \$1.90 per pack price in 1997, before the settlement, 34 cents was state tax, 24 cents federal tax, 46 cents the margin for distributors and retailers, 23 cents marketing costs, 20 cents manufacturing costs, 10 cents other costs and 33 cents profit. The extra tax agreed in the settlement, another 35 cents roughly, would have the effect of pushing the price closer to the level a monopolist would have charged. A lower volume of sales would hit company profits but not unbearably – about \$1 billion out of an \$8 billion a year total. Compared to the alternative, bankruptcy in a continuing hail of lawsuits, this looked like very reasonable terms for the settlement of a whole big tranche of cases. At the same time, the higher price would

generate an estimated \$13 billion in tax revenues to pay the lawyers. Oh, yes, and to meet the health bills for the sick smokers.

Not only do consumers bear the burden of the substantial tax increase negotiated in the tobacco deal, but poor consumers bear the heaviest burden. Cigarettes are an **inferior good** – people smoke less as their incomes rise. Taxes on cigarettes are therefore highly **regressive**, or proportionately much higher for those on lower incomes. People earning less than \$30,000 a year could face an estimated rise of 9% in their Federal tax burden as a result of the tobacco deal.

There is an extra twist to this extraordinary tale. The fifth company in the market, Liggett, is probably \$400m a year better off as a result of the settlement. It handed over secret industry documents to the plaintiffs' lawyers and argued successfully that turning in evidence to the state meant Liggett should be exempt from the new tax increase. Clearly giving one firm out of five a 35 cent cost advantage on a product that costs 20 cents to make is problematic, so the exemption applied only up to a 3% market share. But that was more than twice Liggett's market share in 1998. The company might have deserved some reward for helping turn the tide in the legal battle against tobacco, but an annual reward equal to four times its pre-settlement stockmarket value seems a touch generous.

Jeremy Bulow and Paul Klemperer, the two economists responsible for a magnificent intellectual demolition job on the multi-state tobacco deal, put forward a couple of radical proposals they think would have made much better economic sense and been better for public health. One would be to sell licences to make cigarettes, shrinking the number of cigarettes that could be manufactured each year, ensuring that the amount smoked continued to decline. Total consumption of cigarettes in the US peaked in 1981, and consumption per capita even earlier in 1963, but the decline is quite slow. Licences to manufacture would amount to government regulation of the quantity of smoking, which might seem an unwarranted intrusion on freedom of choice. But with the tobacco deal it is already regulating prices sharply upwards. There is not a big philosophical difference.

The second suggestion is for the government to buy the US tobacco businesses – in effect nationalize them – funding the acquisition through the tax. The benefit of this would be to take tobacco executives and shareholders out of the picture. Taxpayers, including smokers, would get the benefit of the industry's mega-profits instead. The two economists also speculate that there

would be a public health benefit too, as they think a nationalized cigarette industry would lose customers faster: “If there is one thing government monopolies are traditionally good at, it is deglamorising their products and making them as consumer-unfriendly as possible.”

It’s too late for radical moves, unfortunately. There is no political will to unstitch a deal that took years to put together. Nor is it obvious that the lawyers would benefit, in which case the radical proposals are definitely non-starters. For another of the great lessons of the tobacco deal, as if it were needed, is the power of the American legal profession. In fact, that might be the one exception to the general principle with which I began, that only people pay taxes. Because, of course, lawyers pay taxes too.

Chapter Eleven

War Games: A government's gotta do what a government's gotta do.

Defence has long been one of the highest priorities in public policy. The defence of the nation is the classic example of a **public good** provided by the government. Even the most ardent free-market conservative – actually, especially an ardent free-market conservative – believes the government has to raise enough tax to pay for the military. Yet the apparently simple aim of making adequate provision for the security of the nation raises some difficult questions.

For defence is where foreign policy and economic analysis collide. The users of weapons not only need a military strategy, they also need a commercial strategy for procuring all that expensive hardware. Wherever strategy is important, either in defence or in less lethal areas of business, **game theory** is a natural way to think about what the outcome will be. 'Game theory' is less fun than it sounds but it's nevertheless a fascinating and powerful technique for understanding behaviour in situations where the 'players' are not operating in the perfectly competitive and static markets of simple economic theory.

One example is the famous 'prisoners' dilemma' in which two partners in crime are interrogated separately and offered a reduced sentence if they shop their colleague. If neither tells on the other, they will each get five year sentences. If one confesses the details he will get just one year but his partner ten years, but if both spill the beans, both will go to jail for ten years. The outcome if they compete, by each implicating the other, is the worst.

Games in real life are much more complicated. And game theory has played a vital role in analysing strategic problems of all descriptions, including defence. There is no more powerful way of trying to inside your enemies' minds and predict what they will do. As the opening line of the movie *A Beautiful Mind* puts it, 'Mathematics won the war.'

Let's start, though, with the most basic questions in national defence. For example, should you make all your own weapons or import them? A national arms industry has the advantage of security of supply and control over the technology, not to mention all the potential commercial spin-offs.

However, complicated weapons systems are very expensive to produce, involving a vast amount of research and development. So much of the cost is the initial **fixed cost** of development and testing prototypes that there are huge **economies of scale** in weapons manufacture. To give an idea of the figures, the development of a new air-to-air missile runs at about \$1.5-2 billion. America, the world's lone superpower for the foreseeable future, does develop its own weapons, but for European countries it looks a lot more sensible to work jointly or simply import.

If a country does opt to make rather than import weapons, the next question is whether it should allow the export of the arms to third countries to try and recoup some of the costs, because it is after all more efficient and profitable to manufacture the weapons on a very large scale? Governments and their commercial partners which have developed an expensive weapons system are in a position of monopoly power and could make a tidy profit – as long as they are happy for other countries to have access to the weaponry and the technology. These judgements are becoming all the more difficult as more and more military technologies have lucrative commercial applications, such as the Global Positioning System. This technology uses satellite information to pinpoint exact locations on the earth's surface, and has been pounced on by auto and satnav manufacturers, for example. Even email software was once at risk of a US government export restriction because the National Security Agency objected to foreigners being able to encrypt their messages using the (then) spy-proof methods developed by American companies.

The balance of judgement is rather different for different types of weapon. In the case of weapons of mass destruction or those classified as 'inhumane' (as if there were humane ones) like landmines, considerations of security and morality tend to outweigh the economic arguments, for obvious reasons. Thus most nuclear powers, although unfortunately not all of them, are cautious about helping any other country develop the same capability, and few governments with the capacity to make biological weapons see this as a burgeoning export industry. There is a real fear that chemical and biological weapons could fall into the hands of terrorists, too. So ultra-strict export bans tend to apply. (It can still be difficult determining exactly what to ban, as a notorious British trial of three businessmen who had sold a big pipe to Iraq demonstrated. The government alleged it was part of a 'supergun'. As the sale had been given a government export licence, the businessmen eventually won their argument that it was in fact a pipe.)

At the other end of the scale, trade in light weapons such as rifles and machine guns, which are the main cause of death in conflict, is extremely hard to monitor. There is a substantial

legal and illegal market, and many countries make their own small arms anyway because the technology is relatively simple and they are not costly to manufacture. In fact, some conflicts involve even more basic means of death, generally not imported, like the machetes that were the preferred method in the Rwandan massacres.

So the economically interesting part of the arms trade concerns the major weapons systems in between these other two categories, items such as aircraft and warships, missiles, tanks, heavy artillery and so on. Often they are packaged with services such as training and maintenance, which can be the most profitable part of a contract. Secrecy means there is no reliable source of statistics on this trade. However, estimates indicate that the five permanent members of the UN Security Council, the US, China, Russia, France and the UK, account for about 85% of the world supply of arms. The United States exports about 15% of its production, the UK and France 25% and 20% respectively. About 80% of sales go to smaller and poorer countries, mainly in particularly troubled regions of the developing world.

This suggests that whether a country is an arms exporter or importer clearly has a geopolitical aspect. But there is an economic aspect too. Even very poor countries produce light weapons and munitions for their own armies. Very rich or very big countries are self-sufficient in arms and some are substantial exporters of bigger weapons systems. The main demand for imported weapons therefore comes from countries with middling levels of GDP, not big enough to produce all their own but still big enough (or badly governed enough) to have ambitions that require weapons that pack a bigger punch than machine guns.

However, the available figures suggest demand for arms imports has fallen substantially since the end of the Cold War, and is indeed negligible outside a few areas like East Asia and the Middle East, although these figures necessarily exclude the growth market of terrorist demand for weapons. Falling prices and fierce competition for contracts suggests there is massive global over-capacity. Given the size of government subsidies for some arms manufacturers, which must be offset against manufacturers' profits to assess the national economic benefit, it is doubtful whether there is a positive net return in the arms business at all. It looks a lot like a declining rust-belt industry such as steel or shipbuilding, although one with a lot of strategic and political baggage. Certainly, there have been numerous mergers in the US and European industries, in an effort to shrink the amount of excess supply. Making a profit is complicated by the fact that

government policy prohibits the sale of major weapons systems to some potential paying customers.

For the manufacturers the problem is relatively straightforward: how to make a profit in the teeth of stiff competition, subject to all kinds of government restrictions, but also with a captive market in the shape of your own government and with a good chance of getting generous taxpayer subsidies through cheap export credit, funds for research and development and so on. For governments, it's a different matter. They want to achieve several potentially conflicting objectives through the arms trade.

One such objective is to enhance national security. This points to spending a lot on arms. But if one country spends a lot, this can create military instability by making neighbours and enemies feel insecure – there is an externality, in other words. If every country spends a lot on arms, in an arms race, this can be much more stable militarily but involves an inefficiently high amount of spending on arms rather than on hospitals or schools. This is why politicians sometimes conclude it's worth putting a lot of effort into arms control regimes. Not just because it might save lives but also because a regime that involves less spending on defence is economically more efficient.

If a group of neighbouring countries are allies, like the western European nations since 1945 (but not before), then the ones with big defence budgets are providing a public good to the others sheltering under their defence umbrella. But that might tempt some countries to **free ride** by under-spending on their own defence and exporting what arms they do produce (although it will come to seem less like free-riding the closer the political integration of the European countries becomes).

Another government objective coincides with that of arms suppliers. It is to have a profitable arms export business, in order to reduce the amount of subsidy that needs to be paid and to create or save jobs, often in particular regions of the country. The arms industry is dominated by a few large companies, and also experiences big economies of scale, as described earlier. That means it is an oligopoly, or even monopoly in some categories of weaponry. There just aren't all that many companies that make tanks, nuclear submarines or fighter planes. In such an industry restricting output and raising prices will maximize profits. The output of arms will in fact be smaller than if perfect competition prevailed.

Unfortunately, history indicates that it is difficult to make arms control regimes stick. Countries are all too willing to kill each other's citizens, or their own. Oligopolies in general are not very stable. OPEC, the cartel of oil producers, is one example. For about a decade from the early 1970s it sustained huge oil price increases by restricting production. In 2000 this wildly successful policy enjoyed a renaissance. However, despite knowing how well it works in terms of increasing their revenues, most of the time OPEC is unable to limit how much oil its members pump out. There is an overwhelming incentive to free-ride by letting all the other members restrict their output while increasing your own in order to take advantage of the high market price. But once the free-riders start to increase supply, the price will fall and the discipline breaks down.

Arms manufacturers have the same incentive to undercut their rivals, especially in a shrinking market, and one in which deals are generally kept secret. (After all, the oil price is flashed on screens all around the world all the time. It's difficult to hide any change in supply and demand conditions.)

So even at the purely commercial level both arms buyers and arms suppliers have tricky strategic considerations. The relevance of game theory becomes still more apparent when we turn to military considerations. Game theory involves difficult mathematics. In general, though, all parties involved will benefit if they co-operate rather than compete (sometimes requiring that one compensates another); but there are clearly incentives not to co-operate, especially in the arms business. Even a non-cooperative game can result in a stable equilibrium outcome. However, the arms market equilibrium often appears to be unstable too, instability in an arms race implying war.

The Anti-Ballistic Missile treaty that kept the Cold War cold was stable, thanks to its foundation on 'mutually assured destruction'. If one side launched nuclear weapons at the other, it was guaranteed it would be attacked in return. The cost – atomisation of major cities and much of the population and the economy – was sufficiently high to deter the USSR and the US from starting a nuclear war. However, to keep up a credible threat of destruction required both to spend huge sums on nuclear weapons. The equilibrium was, like other arms races, stable but inefficient. Much of the intense concern outside the US about President George W Bush's National Missile

Defence (NMD) system is not a worry about a return to inefficiently high defence spending, however, so much as a fear that the new equilibrium might be unstable.

This discussion has so far assumed nation states are the relevant political units in analysing warfare. But most of today's conflicts are civil wars – all of the 17 major conflicts recorded by the Stockholm International Peace Research Institute in 2006 occurred place within one set of borders (although some of these involved troops from elsewhere, mainly peacekeeping forces). Most of these civil wars occur in developing countries, which is just what you might expect looking at the pattern of which countries export and which import arms. In a civil war, the analysis of the 'game' might involve different ethnic or religious groups.

On the face of it is both tragic and puzzling that the world's poorest countries are the ones squandering resources on warfare. Why is there more instability in these regions? In some developing countries there are natural resources to fight over, whether diamonds or oil or water. Plentiful natural loot of this sort tends to lead to a high level of conflict. However, so does extreme poverty, because this reduces the direct costs of warfare. If there is no abundant physical infrastructure or farmland to destroy, if soldiers have very low earnings potential in other occupations, then the **opportunity cost** of death and destruction is low. Opportunity cost is a way of comparing the actual outcome with what might have been, and in such cases the economic potential of peace is not all that much better than what happens to the economy during the conflict. A lack of hope for the future therefore means higher levels of conflict than in countries where there is a lot more to lose. Research by the World Bank suggests economic conditions such as poverty, slow growth or economic decline or dependence on primary commodities are better predictors of war than any political or ethnic variables. Conversely, growth and prosperity tend to be correlated with peace and respect for human rights and political liberties.

The tools of game theory can be applied to inter-ethnic or other inter-group rivalries. In a divided country, there are two strategies that lead to peace, or a stable equilibrium. One is when the government spends a lot on weapons, so potential rebels would have to spend a lot themselves to win a war. So military regimes can be stable even when they expropriate for themselves large amounts of national resources, making it tempting for rivals to try and replace them. However, this is unlikely to be the most efficient outcome. Alternatively the government, perhaps faced with rivals likely to be good at fighting it, might decide not to spend that much on defence but instead promise to redistribute a share of the national pie to the insurgents. If they can make this

promise credible, civil war can be avoided. However, the number of civil wars both large and small suggests this kind of credibility is in practice non-existent in a divided society.

The number of civil wars has increased sharply since the end of the Cold War in 1989. It is as if the removal of the overwhelming threat of nuclear catastrophe has reduced the potential cost of going to war at a smaller scale. So while arms spending worldwide has fallen, suggesting the war game has been heading towards a more efficient level of defence spending, the stability of the low-spending outcome is not obvious. The American NMD plan has been hugely unpopular amongst other NATO countries, but perhaps President Bush is right to worry about what all the foreigners are doing to each other.

Or perhaps not. Economics cannot answer these difficult questions of geo-political strategy. But it does offer tools, such as game theory or the analysis of industrial structure when there are economies of scale, that can illuminate important aspects of the behaviour of governments and arms manufacturers. Common sense says we should all live in peace and harmony, but as we clearly don't, any insight into why vast sums of money are spent on weapons and by whom must be welcome.

PART III

New technology: how business is coping with change

What the government does crops up in the next set of chapters too, but here the focus is on business in a time of great change. New technologies certainly alter the framework within which policymakers, businesses and individuals have to operate. Today's new technologies have characteristics that make them especially interesting in terms of economic analysis.

Yet even without a big technological development like the computer revolution, or steam power, any economy is in a constant state of flux and evolution, often described as creative destruction. Old industries decline, and new ones are born in different places and employing different people. With winners and losers, this means economics and emotions often clash. No prizes for guessing which usually wins out.

Chapter Twelve

Movies: Why subtitles need subsidies

The 2001 hit film *Bridget Jones's Diary* was co-produced by three movie companies, Canal Plus of France, the independent UK-based Working Title and, representing Hollywood, Miramax. It was not typical of many commercial successes. The heroine was a then relatively unknown actress, nor were the two male leads the biggest stars around. Based on a book which was in turn based on an English newspaper column, there was almost nothing of the conventional Hollywood recipe about it. Oh, except for one thing. With a plot spanning two Christmases, it showed a wintry England blanketed in fluffy white snow. Reader, despite what the Christmas cards portray, it almost never snows in England at Christmas.

The dominance of Hollywood values and American culture in the global film industry, even in a two-thirds European movie like *Bridget Jones*, helps explain why nothing delights a wannabe intellectual as much as art house movies. It's a mark of free thinking and sophistication. Beautiful French actresses taking their clothes off – fantastic! Subtitles – even better!

The chasm between commercial Hollywood films and arty European ones is all too often exaggerated, as the two traditions feed each other. Even so, successive French governments have time after time aggressively defended their right to protect French films, through measures such as minimum local content on television channels, on occasion even holding up all EU-US trade negotiations specifically to safeguard the one industry against the titans of Hollywood. The French call it the 'cultural exception'. Can there possibly be an economic justification for a cultural exception to free trade, though? After all, the case for the mutual benefits of free trade is so fundamental in economics.

Audience preferences certainly seem to suggest this fundamental argument applies in the movie industry, like any other. For the sad truth is that, despite the angst of the intellectuals, most French film-goers are almost as likely as those of any other nationality to prefer the popular Hollywood blockbusters to the obscure and arty home-grown alternatives. Likewise in Britain, the gritty social realism favoured by British directors does not do too well at the box office compared with the American hits. Drug addicts dying in stairwells on desolate northern British estates versus feel-good, glossy romance or big budget action? It's no contest. Some local films do very well of course, but the people's choice is definitely Hollywood.

In which case, you might well ask how European politicians justify special trade protection for their own cultural industries. Surely in culture too free trade will deliver the best outcomes in this as in any other industry, the widest choice for consumers at the lowest prices?

Fan as I am of free trade, I do however think there is something to the cultural exception. It is partly to do with culture, which is really just a non-economist's description of a certain type of **externality**, and partly to do with **economies of scale**.

In classical trade theory the mutually beneficial effect of increased exchange depends on there not being any significant returns to production at a large scale and there not being high start-up costs in industry. In the usual terminology, there are assumed to be **diminishing returns to scale**, meaning that extra units of output cost more, not less, to produce. In these circumstances market mechanisms mean that small is competitive, that small producers can produce more efficiently than large ones. There will be an equilibrium outcome – only one – in which the lowest-cost producers produce and nations specialize in particular industries.

This was pretty realistic two centuries ago. Agriculture and basic commodities formed a high proportion of international trade. Farmers clearly used the best land first, so diminishing returns would set in as they put less fertile land to use, and similarly mines emptied the richest veins of ore before moving on to poorer ones. England could specialize in wool, Ireland in potatoes and France in wine. The same conditions also applied in many traditional manufacturing industries such as textiles and footwear.

However, the classical trade theorists like David Ricardo did not give much thought to Hollywood, or even the possibility of mass production and the assembly line in manufacturing. In the case of many manufactured goods there are substantial start-up costs and hence economies of scale. The research and development, design and set up costs for a new type of car or aircraft or a new medicine are extremely high. In such industries there are increasing returns to scale. They exist, too, in new industries where the marginal cost of producing additional units is tiny, such as the software business.

For the most part international trade now involves the exchange of manufactured goods like cars or washing machines or pharmaceuticals between the developed countries. However,

there is a fair degree of specialisation. Different countries lead in different sectors, especially in high-tech or advanced industries where you might expect large economies of scale, and tend to hang on to their lead. It is clear that historical accident has played a part in the specialisations that do exist, and that countries can develop industries despite lacking the obvious natural resources. For example, Japan is a significant producer of automobiles and steel, despite being naturally short on iron and energy, while the only reason the UK still makes any cars is because some of the key innovators in the early development of vehicles powered by the internal combustion engine were British.

Under conditions of increasing returns to scale, market forces can take the world economy to many possible combinations of output, depending on such happenstance, because it is hard to dislodge a particular country from an early lead. And it cannot be confidently predicted that any particular outcome will be the most efficient possible. Increasing returns introduce the conclusion that it all depends – on which countries' industries get to what size and when. In such a world – the real world – the conventional conclusions of trade theory will still usually apply. It will not be efficient for an industrialized country to produce almost everything it consumes itself, splitting the workforce between many different industries. What's more, any country will benefit from its trading partners being equally successful in a wide range of industries because that will generate the prosperity necessary to create a big market for its own products. Poor, isolated countries do not make good trading partners; rich, integrated ones do. So there will continue to be gains from trade. In fact, there may be more potential for gains globally from trade precisely because there are increasing returns in many industries.

The hitch pointed out by theorists recently, as increasing returns to scale have become more characteristic in the advanced economies, is that in some cases trade need not be *mutually* beneficial. For if increasing returns benefit big producers, those producers will be located in particular countries. There might well be zones of conflict in which the success of one industry from one country actually damages other countries. It is likely that such conflicts arise between very similar developed countries or regions, like the EU and US. An obvious example is aircraft production, essentially a two-horse race between Boeing and Airbus.

Another is the movie industry. The economies of scale are slightly different. They do not arise in production; after all, there are plenty of low-budget movies around. The costs of movie-making are still plummeting thanks to continuing technological innovation like Apple's fantastic

iMovie software or small and low-cost professional-quality HD cameras now available for the consumer market. Instead, the returns to scale occur in buying in superstar talent, and in marketing and distribution, as discussed earlier in the case of sport and music. Anybody can make a high-quality film at low cost, but few can translate their creative skill into box office success.

Now, I am highly sceptical of most industry lobby groups' claims that theirs is a special case and they deserve protection from overseas competition. Even though there is a potential theoretical justification, I'm certain it does not operate in practice as often as **special interest groups** would like us to believe. While exploiting economies of scale might sometimes offer greater efficiency and higher output in theory, the benefits from competition point the other way. Figuring out whether a given industry is in a zone of conflict with trading partners is an empirical question, and one highly vulnerable to political manipulation by rich and powerful corporations and lobbyists. Some economists in the late 1980s started out enthusiastic about the idea of 'managed trade', based on figuring out which particular national industries needed government help to exploit economies of scale or protection against competitors able to exploit them, but retreated from their enthusiasm when it became obvious the argument had given the usual suspects fresh ammunition to operate against the public interest.

In the case of the movies, I'd nevertheless be inclined to give the European film industry the benefit of the doubt. It might just be an exception to the rule that freer trade is always better. It seems very likely that the big Hollywood studios have an important advantage over European competitors even in European markets because of extensive increasing returns to scale. Hollywood has got into this position because the US itself is the biggest single English language market in the world, whereas language fragments the European market even though movie-making had a head-start there historically. Scale means Hollywood can always thrash British or French or Italian movies commercially. Yet the dominance of American films is not necessarily the most efficient and desirable outcome for the British or French or Italian economies – or cultures.

It is not as if movies account for a huge portion of international trade and GDP. However, the social benefits of having a domestic film industry probably outweigh the private benefits. The contribution to national culture exceeds the private return to moviegoers of watching pneumatic French starlets or scrawny Scottish junkies (especially the latter). In other words, there is a cultural externality, a gain unlikely to be realized by the operation of market forces.

It is with trepidation that an economist brings in a consideration as fuzzy and controversial as culture, even in the loosest sense, into the argument. Some economists would disagree altogether. However, I have put forward here the kind of argument you need to make to persuade other economists of the merits of special protection from completely free trade for European movies. In other words, it's not enough to say the film industry is part of the nation's cultural heritage, full stop. Defenders of subtitled films need to make a stronger case than that.

After all, in the advanced economies, culture, however defined, is an economic resource. If an increasing share of GDP is generated by services like the creative industries, creativity and new ideas are important. It is impossible to say for sure where ideas come from, but a vibrant and distinctive culture is bound to play a part.

Personally, I feel that an afternoon spent watching something subtitled is as much hard work as a few hours running regressions sitting at the computer. One thing's for sure: Hollywood has the best special effects but it's really not the place to look for the intellectual cutting edge.

Chapter Thirteen

Networks: ‘The program has unexpectedly quit....’

That’s just one of the things computers say to their users pretty often. Even more often they just freeze without warning.

It’s one of the everyday frustrations of modern life. But why? Why do we passively continue to use software that imposes on us such costs of lost time and raised blood pressure? The answer, in short, is that I use it because you use it and so does almost everybody else. It is Microsoft’s great commercial achievement to have made its software the near-ubiquitous standard in desktop operating systems and applications such as spreadsheets, slideshows and word processing. Not to mention notoriously having a go at cornering the market in Internet browsers too, at the expense of Netscape, which proved to be a step too far for the US Department of Justice, and led Microsoft into an apparently never-ending battle with the US and EU competition authorities.

Microsoft’s dominance is a classic result of a phenomenon that seems to be more and more common in the economy, **network externalities**. A network is a set of links connecting people and equipment. The Internet is one, as is the rail network or the telephone network. Some are a bit less obvious: automatic teller machines, for example, linking people and cash in banks. Money itself is another example – it’s not much use me trying to spend cowrie shells if you use cows as a medium of exchange.

Network goods are accounting for a growing share of the developed economies, including information technology and communications, entertainment and finance. The share of GDP accounted for by these categories has climbed sharply during the past quarter century. Network goods differ from conventional goods and services like donuts or haircuts. Nobody wants a telephone for its own sake. The value to consumers lies in the telephone plus the link to another telephone. Or preferably lots of other telephones. The more people are linked to the network, the more useful it is and the more consumers will want it. This is the network externality. It is a powerful effect. Suppose there are 10 telephones, with 90 potential links between different users. Add one more user, and you get 20 extra potential links. Moving from the 100th to the 101st user adds 200 additional links.

Traditional goods are **substitutes**: if I buy more of one out of a given income I will get less of another. Network goods **complement** each other: the phone is no good without the phone line and the other users, or the PC without the printer, Zip drive, Internet connection, and so on. The value of the network good increases with the number of units sold. A network externality is in effect an economy of scale in demand.

What's more, many network goods fall significantly in cost the more of them are bought because they are characterized by economies of scale in production too. In developing software, for example, almost all the cost is upfront in the programming and marketing. Making additional copies and distributing them is very cheap. So if the developer can sell a million copies rather than a hundred thousand the average cost and price can be much lower. The same is true of any high-tech network which involved a lot of upfront research and development.

The presence of economies of scale in demand and often supply as well mean network industries could be prone to dominance by monopolies. The scale effects mean it is hard for new competitors to break into the market, just as it is in aircraft manufacture or petrochemicals. What's more as with any externality, the presence of network externalities means the amount of the good produced privately is unlikely to be as high as the socially desirable amount. If the producers cannot capture the benefits of a bigger network, they will under-produce. This will be true whether there is perfect competition between producers or a monopoly. In fact, there is likely to be an even smaller network when there is a monopoly because the monopolist can increase profits by restricting supply. Competition is better for consumers even in these circumstances. That is, unless the monopolist can find some way of clawing back those network benefits. It might be able to do so to some extent by setting different prices for different consumers. For instance, if businesses value the connectedness more than individuals, the company could try and charge the businesses a higher rate. Even so, whatever the industry structure, networks are likely to be too small.

In many cases, the desirable size of the network could actually be everyone. For example, telephones are most useful if you can get hold of absolutely everyone you might want to talk to. In fact, there does seem no limit to our demand for telephone connections as the growth of second and third lines, ISDN and broadband lines and mobile telephony demonstrates.

In many a communications network, the ideal is ubiquity. It rarely happens. Even Microsoft with its relatively high degree of monopoly power and drive towards world domination only wants Windows and Office to be ubiquitous if everybody has paid them enough for it, 'enough' being a lot.

Many providers of basic telephone services (often ex-state monopolies) are required to make lines available to anybody who will pay a regulated sum. In most other examples, however, the government does not step in to make the network's coverage universal, and its role tends to be restricted to making sure networks deliver the maximum possible benefits to consumers.

One method is by enforcing technical standards. Thinking about the ubiquity of technical standards actually reveals how many goods and services have network aspects. Battles over standards for new products spell the difference between huge profits and commercial disaster, and the history of technology is littered with casualties. Technological **lock-in** benefited Microsoft at the expense of Apple, and VHS vidoetapes rather than Betamax (and who remembers that now?), the gasoline engine, the voltage at which electricity is delivered into our homes, the shape of electric plugs, the 'QWERTY' keyboard we English-speakers still use because everybody has learnt to type fast that way, the size of screw threads and countless others.

As these examples suggest, the chance events of history can play a huge part in determining which technologies and which companies succeed. In addition, creating critical mass in the market for a new product very rapidly can be crucially important. The combination of the **first mover advantage** and the importance of cementing it with enough customers explains why so many Internet businesses have thought it was a good idea to lose a lot of money for a long time. It is a kind of special introductory pricing, common with many new products like green tea flavoured cookies or a new type of cheese dip, but more important to technology companies. As it turned out, many of the dot coms were wrong to think losing bucketloads of money in order to buy enough customers would guarantee their success. But the survivors, like Amazon, have grown large and enormously successful.

The 'burst to be first' tactic has certainly worked in the past with many companies creating a genuinely new technology (as opposed to just using one which already exists like the Internet). For instance, in the 1880s and 1890s many manufacturers of electrical equipment gave away free electricity to attract consumers. This helped Westinghouse establish the alternating

current rather than direct current as the standard in electricity transmission and equipment, and the resulting ability to transmit electricity safely over long distances was in turn a vital pre-requisite for the widespread use of electricity.

Sometimes governments co-operate over technical standards, as in international telecommunications. European governments set the GSM standard for mobile telephones in order to ensure a big, continent-wide market for the blossoming new product. It is often argued that this helps explain the greater success of European mobile phone companies than their American counterparts, though the high and restrictive price structures for fixed telephony in Europe (legacy of all those state monopolies) must also have played an important part.

The individual companies in an industry might have an incentive to agree on compatible standards. They will all benefit from agreeing to a standard if compatibility increases the size of the total market by a large amount. In many cases this is exactly what happens. Where there are network effects, co-operation between companies can be good for consumers, rather than damaging them, as long as the co-operation is helping develop a bigger market within which the companies will go on to compete with each other in the approved manner.

On the other hand, if they are big enough they might do better by setting a proprietary standard and trying to monopolize the market. These countervailing forces have become very apparent in the computer software industry, where it has taken on a philosophical cast with the growth of the 'open source' movement and development of Linux as an operating system to compete with Microsoft.

What's best for consumers as opposed to companies is undoubtedly complete compatibility. There is nothing more frustrating than not being able to open or email a file or use a CD-rom because it doesn't work with your machine's operating system. Perhaps the government's role in setting international technical standards should extend from the telecommunications industry to the computer industry as it becomes harder and harder to draw the line separating the two.

Some economists believe compulsory licensing of software or other proprietary technical knowledge is the best way to enforce competition in network industries. Others believe this is

draconian and unnecessary because there are other strong forces for competition in high-technology industries, discussed later.

Without legal force, the result will sometimes be incompatibility. As the many examples of past winners from being the technological first mover demonstrate, there are substantial profits in store for whichever company can see off the competition in terms of setting the standards. The first company in a particular network business (and often consequently the biggest if there are also big economies of scale in production) has every incentive not to co-operate in agreeing to a compatible standard – as long as its own standard is a good one. If it has a genuinely bad technology, the advantage will go to the ‘second mover’ in the industry, which will have had chance to learn from the first mover’s mistakes. But assuming the first mover has a good enough technology, it would rather rely on its dominant position and then perhaps license its own standard to any would-be competitors.

Better yet to see off the competitors altogether, of course. This is what makes network industries, often described as **natural monopolies**, so challenging for a government’s anti-trust authorities.

Take the Microsoft case. Its defenders argued that there was no genuine damage to the public caused by Microsoft’s dominance. After all, they said, the company had invented and developed a fantastic product (one which benefited consumers precisely because they almost all used it), had created a market which hadn’t existed in 1980, and what’s more its prices had been falling over time. There was also a real threat of competition from innovation, from the potential for completely new technologies that would undermine the use of desk-top computer operating systems altogether, the company argued.

The counter-argument is that the product quality would have been higher and price lower if there had been competitors in the market, but that aspects of Microsoft’s behaviour prevented competition. Just because consumers have been able to buy good software does not mean they could not have bought better software for less in a different market structure.

Both Microsoft and the Department of Justice put forward good arguments. The competition dilemma in network industries is genuinely difficult. Consumers do gain from a common standard, whether set by governments or a dominant company, because it increases the

size and value of the network to them and guards them against the risk of choosing the losing standard in a technical and marketing contest.

But there is no reason to believe common standards will evolve in a genuinely competitive market. That would happen only if none of the competing companies believed it had an edge over the others in terms of speed, product quality or initial market size. In practice, that doesn't seem to happen very often.

This suggests that the emergence of a dominant company with a proprietary standard will bring consumers significant network benefits. Electricity once again offers a good example. In 1896 Westinghouse and GE entered a 15-year patent sharing agreement, creating a duopoly in electrical equipment. But as they also gave away electricity to create the market for their equipment and in the process gave a decisive boost the electricity transmission system, it is hard to be confident their duopoly acted against the public interest.

Even so, as we saw earlier, the network created by a monopoly (or small oligopoly) will be smaller than desirable because the monopoly firm will restrict sales by charging a high price to boost profits. In this case it would be in the public interest for the competition authorities to require a monopolist to licence its technology to competitors (on non-prohibitive terms – and it is not easy to figure out what the fees should be). That will lead to the growth of a bigger network. Breaking up the monopoly instead – one proposal for dealing with Microsoft – might or might not benefit consumers. That would depend on which companies owned what parts of the network. In the case of the fixed telephone network, for example, the break-up of long-distance from local calls and introduction of long distance competition has certainly benefited telephone users. The crucial last bit of local link to people's homes and businesses is a natural bottleneck because the costs of all that wiring are so high it cannot be replicated by a would-be competitor, which is why local telephony is everywhere so highly regulated. On the other hand, introducing long-distance competition turned out to be easy, although the level of interconnection fees to the local network is a contentious matter for which different assumptions give different answers.

Of course, even the local telephone stranglehold has proved vulnerable. Wireless technology now exists to compete with the wires. In Europe and also in many parts of the developing world where wired phone networks are inefficient and small, mobile telephony is now

providing very effective competition. The pace of technological change itself can undermine the market power of dominant companies.

This is exactly what some economists believe will ensure competition in network industries more effectively than anything else, the gale of creative destruction at a time of rapid technological change. Bill Gates was famously nearly taken by surprise by the Internet, but the real technological challenge to a company with a monopoly in desktop operating systems will be the decline of ubiquitous desktop computing. Some combination of Google and wireless operating systems might yet make that come true.

This kind of technological leapfrogging could yet happen. Some technology experts compare the desktop or laptop PC to the all-purpose electric motors sold to households in the early 20th century. The modern housewife would buy one motor and use it to run a whole variety of domestic appliances. But eventually each appliance came with its own internal motor and the consumer could simply forget about how to operate electric motors altogether. The parallel now would perhaps be the pocket digital assistant/mobile telephone/email device, the TV/DVD/CD-rom player, and the smart household appliances. Computing power will be distributed between communications devices, entertainment devices and appliances, or in other words used for specific purposes, making the all-purpose desktop computer irrelevant.

Unfortunately, competition authorities cannot always rely on technological innovation to do their job for them, although the length of time a company has held a dominant position can give useful clues as to whether it is able to abuse its monopoly power or not. Bell, later AT&T, dominated the US telephone network for well over half a century. It had started out as the technologically superior long-distance operator but faced stiff competition in local markets. Its tactic was to refuse to connect to local rivals, squeezing them out by offering callers a better service if they used both the local Bell company and the long-distance service. In the case of telephones, the government-enforced break-up of monopolies in America and elsewhere if anything paved the way for the development of mobile telephony rather than the other way round. There was no urgent incentive for companies to invent mobiles, even though the technological building blocks were there, when the government ensured the fixed telephone monopoly was so profitable. Competition in any industry is an act of political will as well as commercial and technical pressures, because governments ensure the smooth functioning of

markets, and that is more true in network industries prone to ‘natural monopolies’ and first mover lock-in effects than in others.

What’s more, network industries seem to be growing in importance. Partly this is because of the nature of recent technological advance. It has been concentrated in the computer and communications industries which are innately subject to network externalities. There are plenty of examples of network formation, like instant messaging among AOL members, or Facebook, or Ebay, which has grown more popular with sellers the more buyers it attracts and vice versa.

But in addition we are spending a growing share of our incomes on network goods, from financial services to cable TV, software to travel, as we become more prosperous. This will continue with the growing importance of international links. For example, the more people travel from country to country in their jobs, the more likely it is that educational qualifications will develop a network externality as a kind of common currency of ideas. As I hinted, there could also be an increasing network externality in actual currency, pointing to an ultimate natural monopoly of one global money. Let’s hope Bill Gates doesn’t decide to take Microsoft into that market.

Chapter Fourteen

The Internet: the economics of Dot Bombs

It's enough to make me feel old. I've lived through not one but two dot com bubbles.

For a couple of years up to March 2001 a sort of millennial fever of excitement about the Internet swept the stockmarket sending the share prices of high technology companies rocketing skywards. Silicon Valley sizzled. The number of initial public offerings on the three major US stock exchanges leapt from 262 in 1998 to about 500 each year in 1999 and 2000. Many companies were able to print their own money in the shape of issuing shares which they could use to take over other companies. At the peak of the bubble there was a new millionaire made in America every ten minutes, although many unfortunately did not convert their paper wealth into more durable assets. For inevitably what went up later came down. The Nasdaq index lost two thirds of its value in 2001. The flood of IPOs dried up. The dot com dream was over.

Briefly. It took only a few years for the Web 2.0 phenomenon to set the major stockmarkets ablaze again. When Google went public in August 2004, the Nasdaq was still 60% below its 2000 peak. By the autumn of 2007, as I write, the index is far off its heady heights of dot com 1.0, but nevertheless 250% higher than its trough. How much more boom is to come, and how severe will the bust be for Web 2.0?

To anybody old enough to have experienced several booms and busts, the backlash looks both inevitable and just as overdone as the initial enthusiasm. This is, after all, what stockmarkets are like, prone to exaggerating the shifts in real economic trends. You don't even have to invoke irrational investor behaviour to explain a good part of the dramatic rises and falls in share prices. The basic arithmetic of **discounting** expected profits growth far into the future, to allow for the fact that we attach less value to earnings in 10 years' time than today, means that small changes in expectations for the future lead to large changes in valuations now. And then there's the irrational hysteria on top, whereby we all get infected by the enthusiasm for the next big thing, and by the bitter disappointment when it proves not quite such a big deal after all.

So the bursting of the first stockmarket bubble did not spell doom for everyone with an Internet business plan, even though it made it much harder for a while to raise capital via the

stockmarket. Economists are still excited about the Internet. It genuinely holds out the promise of making markets work better because it is easy and cheap for people to find out information on things like product prices and job availability. Lack of information has always been a major source of friction in the smooth working of markets. What's more, there is now enough evidence of a boost to productivity in the US economy since the mid-1990s to have persuaded most economists that the new technologies do have the potential to trigger a faster rate of growth. In short, it is laying the foundations for increased prosperity in future.

The experience of the dot com bust does, though mean a different kind of business plan may be necessary for commercial success. Entrepreneurs can no longer count on venture capitalists funding a business that plans to make a huge loss for several years, because the VCs are a little warier, even during the Web 2.0 equity market boom, about getting their money back quickly through an IPO.

For, somewhat bizarrely in retrospect, losing a lot of money was for a while seen as the key to success for an ambitious dot com. The reasoning was that building a big customer base and locking those customers in would secure for a business the **first mover advantage**. It almost didn't matter what you were selling as long as you won the customers and kept them loyal to your brand. Well, the strategy worked for Amazon, which stayed in the red year after year in order to continue its expansion from the original bookselling operation, and became one of the best-known internet brands. A lot of entrepreneurs thought they would try the same wheeze. It was inevitable that eventually investors would get fed up of businesses that continued to lose money, especially the more idiosyncratic ones. After all, how big a commercial prize could first mover advantage in the market for online knitting patterns possibly be? But that doesn't mean the 'make a big loss' strategy was entirely dumb. The Internet does have some unusual characteristics that affect the underlying economics of an online business.

One feature is the fact that an Internet or information business more generally has high **fixed costs** and low **marginal costs** (or the cost of producing one additional unit). It is expensive to produce the first unit, whether it is a software programme, a service like online gambling or a more broadly defined information good like a research-intensive pharmaceutical or a design-intensive aircraft. That's because all the costs are upfront and require a lot of skilled human input. However, subsequent copies are very cheap, or even zero cost in the case of copies of a programme or online book. The copying can be done cheaply by computers and other machines.

In other words, information businesses are inherently characterized by **supply-side increasing returns to scale**.

The Internet is also a network, obviously, and networks have the characteristic that there are **demand-side economies of scale**, otherwise known as **network externalities**, as discussed in an earlier chapter. Many internet businesses could benefit from the same kinds of tactics used in older network industries such as telecoms, like setting technical standards that become the norm and thus locking-in consumers.

Already we can draw plenty of strategic conclusions for dot com executives. 'First mover advantage' can be genuine, not hype, but it depends on being able to set a technical standard that makes it costly for consumers to switch to a rival later. So software companies and mobile phone operators might sensibly spend money on being first and biggest – look at the importance Microsoft attached to knocking Netscape from its first mover position in browsers – but it is not such an obviously wise strategy for an online retailer (despite Amazon's success) as customers can switch from one 'shop' to another very easily.

Still, there are other potential justifications for high spending on marketing and customer acquisition. The structure of information industries means there are often several advantages to operating at a large scale. They are tied up with the importance of brand or reputation. The cost structure of an information business means pricing policy has to be very different in such businesses compared to a basic old-economy business. The high initial costs are **sunk costs**, which can not necessarily be recovered. (To see why, think about the Channel Tunnel, the rail link under the ocean between Britain and France. Customers don't care how much it cost to build or how fast the shareholders recover their investment, only how high the fare is compared to crossing by ferry.) Equally, the low unit costs of production (or reproduction) mean there is no natural limit to production capacity or potential sales.

Ideally, Microsoft would like to sell a copy of Office to everybody in the world. But how much to charge? The conventional rule of thumb, which is unit cost plus $x\%$, where x varies depending on the industry, is not much use when unit costs are very low. Prices have to be set depending on how much customers value the product. What the market will bear is the guideline. The ideal would be to charge every single customer the amount they personally think

the product or service is worth, but in practice the **price discrimination** has to be a bit broader brush than that.

Possible techniques include offering different versions to business and personal customers; different prices for paper versus electronic versions of reports or software on CDs versus online; sending to regular customers for one kind of item money off coupons for other products; selling the same information with different delays, such as access to share prices either instantaneously or after five minutes; charging extra for faster delivery and by more than the actual cost of getting it to the customer sooner; customizing the product, as Nike now does with shoes ordered online or Dell with computers; and many, many others. It is easy for a company selling over the Internet to build up a detailed database that will help it target customers effectively.

Unfortunately there's a further difficulty with many information goods, which is that people often don't know how much they value them until they have already consumed them. Many are **experience goods**. You need to read a fair amount of a book or newspaper, see most of a video or try running a programme, before you know whether it's any good. So publishers of information often offer samples - demo versions, first chapters, a couple of free articles, the abstract of a working paper. But as much of the information published on the Internet in the early days was free, there is a residual strong demand for free access and strong resistance to paying. So for example in newspaper and magazine publishing only very strong brands, such as the Wall Street Journal or The Economist, have so far got away with meaningful online subscription fees. Some which tries, including the New York Times, have abandoned the effort as not worth while. Most publications make a selection of the material in the print version available free online. Even such a popular author as Stephen King failed to get 75% of the readers who downloaded early chapters of an online book to send in payment, so he ended his electronic publishing experiment.

The fact that many information goods are experience goods is, nevertheless, another good reason for establishing a strong brand, which tends to involve heavy spending on advertising and marketing. Customers are more likely to take the risk of spending money on an experience if they know the company offering it has a good **reputation**, or in other words a good brand image. If a lot of other customers had been disappointed, the reputation would not last.

The importance of reputation partly explains why some predictions that the Internet would wipe out intermediaries like real estate agents or insurance brokers. Customers want a fall-back in case a transaction goes wrong, the reassurance that there is somebody to watch out for their interests and perhaps complain to. What's more, with information plentiful, consumers are swamped with it. 'Bots' that carry out searches and compare prices are far from perfect, being engaged in a technological arms race with retailers which don't want to make price comparisons all that easy. Sometimes it is easier to go to a broker or intermediary.

The **information overload** means businesses need to grab people's attention. Herbert Simon, a Nobel prize-winning economist, summed up the problem long ago: "A wealth of information creates a poverty of attention." This is why just about all the most visited web sites are search engines that sift through the oceans of online information to find the particular tasty plankton each of us desires.

The School of Information and Management Systems at Berkeley estimated that the amount of information produced in just one year, 1999, was 1-2 exabytes (an exabyte is 10 to the power 18 bytes, and 5 exabytes would take care of all the words spoken by human beings so far in history). That's about 250 megabytes for every person on earth, or the equivalent of 250 short novels each, 125 photographs, or 12.5 full floppy disks. The figures did not include the information produced digitally that year but not stored systematically, notably email. The report estimated annual email production at 610 billion messages, requiring roughly 11,285 terabytes if it were stored, or the equivalent of more than a thousand times the printed collection of the Library of Congress. By 2002, in an update, the estimate for the annual production of information had risen to 5 exabytes, and the report said the amount of new information stored had doubled during the previous three years. Yet people are consuming the same amount of information as before, due to limits set by time and physiology. The Internet has not changed information consumption or even production, but it has revolutionized transmission and availability.

It has also made it possible for online businesses to **customize** their contact with overloaded customers. They can build up a detailed customer database and target advertising and special offers to suit the individuals. (That's the theory anyway. Nobody seems to have told the online pornographers, who still seem to prefer to spray their advertising around randomly, if that's the right way to describe it.)

In short, it is easy to understand why many dot coms, and their investors, thought it made sense to spend heavily upfront on product development, marketing and reputation. Where did so many go wrong, then?

Sometimes they forgot that the spending would only be justified by rapid growth in customer numbers, and therefore revenues. After all, there can only be one first mover per market; spending desperately on marketing gimmicks rarely makes sense for a slow-growing number two. Many were hopeless at customisation, targetting and price discrimination. For supposedly high-tech businesses, few appeared to know how to use the available tracking and database technology. They did not make the most of those customers they had managed to attract. Using information well turns out to be hard.

A lot of dot coms also failed to understand that as the Internet is a means of doing business, they still had to have a viable business. It is a channel of distribution that has opened up new business opportunities in a few areas, but for the most part has instead changed the cost structure and market access in existing industries.

Gambling, pornography, software, auctions and banking have been about the most successful internet businesses. These are all genuinely weightless activities - there is no need for a physical product. In each of these cases by reducing **entry barriers** the Net has made it possible for new entrants to break into the market, albeit other big companies like insurers in the highly regulated banking industry. It has also made the potential market bigger by extending its geographical scope. There have therefore been good business opportunities in such industries, as there would be in any industrial shake-up.

In other industries such as publishing and retailing, or music, which are highly dependent on distribution channels that have built up in specific ways over a long time, the arrival of the Internet has been more problematic. A new means of distribution can simply cannibalise existing ones. The UK's most successful online business is Tesco, the biggest supermarket retailer. Its online ordering and home delivery service has grown at the expense mainly of other supermarket chains but also because some of its own physical customers switched. In fact, many retailers have come to believe the only difference the Net makes to them is that it's one more means of contact with customers they now have to provide along with physical presence, telephone access

and mail order. It hasn't increased the demand for their goods at all. Shopping online for most customers means shopping differently, not shopping more.

Newspapers face a similar dilemma: they might only gain some of their online readers at the expense of purchases of the physical paper, which is a problem when the former is free and the latter paid-for. Their market has in fact continued to shrink in the face of competition from specialist magazines, TV and other forms of entertainment.

Finally, let's face it, some of the dot coms were just silly ideas that could only have got off the ground at all during a wave of hysteria like the turn-of-century New Economy boom; or instead were perfectly decent retail ideas implemented at indecent cost, with high salaries and hip offices as well as glitzy advertising campaigns, because venture capitalists were throwing money away. Because the Internet has not abolished the basic requirement that a viable business needs to generate healthy growth in revenues. It certainly hasn't rewritten the rules of economics.

Some Internet businesses have got economists really excited, however. They seem to have a business model that would be impossible without this particular technology. One is Ebay, the auction site which matches buyers and sellers of specific items, under an agreed set of rules, in a way that would have been impossible without the Internet.

The other is Priceline, motto 'Name your own price', which asks customers to suggest what they would be willing to pay for an item - often a flight - and tries to match the offer to a supplier, such as an airline with empty seats on particular routes. Again, there are clear rules and the company, like Ebay, deals with the credit card payments. These two companies, one very successful, the other getting there rather slowly, take advantage of the technology to do things that would otherwise be impossible. Priceline achieves perfect price discrimination by asking every customer to specify how much value they place on a certain item like a flight. Although airlines are selling only a few of their tickets this way, it does mean more than ever that planes are full of people who've paid prices ranging from a celebrity or top executive in First Class all the way to the low amount offered by someone who wanted a last-minute weekend away. And they are more often full, with no empty seats that could and should have been bringing in revenues.

Ebay takes both the differential pricing and also matching of buyer and seller even further by making it possible for almost anybody to auction almost anything. Buyers acquire items

paying exactly what they think they are worth. Sellers find buyers for items they might not have been able to sell at all in the restricted local market.

Some 'business-to-business' online exchanges also take advantage of the Internet to match widely dispersed buyers and sellers. Although less visible to most of us, economists have estimated that businesses will be able to make significant cost savings through the use of 'B2B' exchanges. Job recruitment sites also take advantage of this specific feature, the unparalleled ability to match demand and supply. They are making it easier for job-hunters to find work, wherever it might be, and easier for employers to find staff with the right skills.

The beauty of such businesses to economists is precisely that they hold out the promise of making markets work better, removing obstacles like lack of information about prices and availability, or the whereabouts of potential buyers and sellers, and reducing the costs of search and carrying out transactions. Whether they and rivals will expand to account for a significant part of our spending is another matter.

As for the Web 2.0 boom, perhaps the fact that it has come soon enough after the first dot com boom and bust has made potential investors a little warier. The stockmarket bubble doesn't look as inflated (yet) as the first version. There are large amounts of money on offer to businesses which are making a loss, but fewer of them, and the poster child of Web 2.0, Google, is highly profitable. But it still won't surprise veterans of 2001 if the crash comes.

Chapter Fifteen

Industrial change: Jobs old and new

In Britain's shambolic rail industry, the train companies face steep fines for every minute behind schedule the services run. The fines are imposed by the industry regulator, but the train operating companies and the authority which runs the tracks and signals, have to parcel out the blame to decide who should pay them. After several dreadful accidents, by early 2001 a high proportion of services were running very late. The result was entirely predictable. It was the creation of an entirely new profession, the 'delay attributor'. Railtrack, then the network operator, had 180 people in its delay attribution department in mid-2001, and the operating and engineering companies at least 120 between them.

That's just one example of the ability of an economy to create jobs where there is an unmet need. There are countless others. For example in the mid-1980s I worked as an economist in the Treasury and was set the task of writing a short and simple explanation of financial derivatives, so short and simple that ministers would be able to understand it. The derivatives market was still pretty small, but the financial markets in the City of London were about to be deregulated and it seemed clear that derivatives would be one area of growth, as had already happened in New York. Only a handful of people working in the UK could be classed as derivatives traders. Within a decade, there were many thousands. However, as the trading is automated, the numbers will probably be back down in the hundreds before a second decade is over.

In fact, large scale job creation and job destruction is a basic characteristic of a capitalist economy. In any single year in the US at least one in twelve people will change jobs, and the rate of turnover is similar in Europe. Britain is the only European economy where it is a little lower, and even there the turnover corresponds to 2m people out of a workforce of 25m changing their job each year. Some years in some countries the proportion is as high as a fifth of all jobs turning over.

When you think about it, this makes absolute sense. The structure of all the advanced economies has changed radically over time. Of course we don't need telegraph operators, hurdy-gurdy players on city streets or Fortran programmers in 2001, whereas we do need call-centre operatives, baristas in coffee shops and web page designers.

The most dramatic change in every advanced economy is the decline in the share of manufacturing industry, and the rise in the share of services. (Going further back in time the key shift was from agriculture to manufacturing, the initial effect of the Industrial Revolution on work. The poorer OECD countries still have a big agricultural workforce, 25% of the total in Turkey for example, but in the UK just 1.2% of the workforce is employed in agriculture, in the US 1.9% and in France 2.6%.)

The expansion of the service sector is a longstanding trend. The proportion of GDP and total employment accounted for by manufacturing peaked in the US in the mid-1960s, and even in more heavily industrial countries like Japan and Germany by the early 1970s. The proportion of the working age population employed in industry now ranges between about 10% and 20% in the rich OECD countries, with Japan remaining at the top of this range.

According to the wonderful database maintained by the Bureau of Labour Statistics, freely available online, the total number of employees in the United States has climbed from 47,230,000 at the start of 1951 to 137,329,000 fifty years later. Of this total, 34.5% were working in manufacturing at the start of that half-century compared with 10.3% at the end. (The absolute number of people working in America's manufacturing industries had climbed slightly up to 2001, from 16.3 million to 17.3 million, but has since fallen sharply. In many other countries manufacturing has been in an absolute as well as a relative decline long term.) There were corresponding increases in the proportion working in all of the service industries, up from 62.9% to 83.5% in retailing, and within this from 4.1% to 6.1% in finance, and leaping from 2.0% to 13.1% in education and health. This category of services alone employed more people than all of manufacturing at the start of 2007. Oh, and of course, more people work for the government now, 22.3m people or 16.2% of the January 2007 total, compared with 6.2m or 13.2% in January 1951.

Even within manufacturing there has been significant structural change - but less than you might expect. Not surprisingly, there has been growth in industries like computers and electronics. The computer and office equipment industry employed almost nobody in 1951, a fraction of 1% of the manufacturing workforce. After half a century, the total was 363,000, or 2% of those employed in making things in America. Similarly, the workforce in electronic components climbed from 170,000 to 697,000, or 1.0% to 3.8% of the manufacturing workforce.

Looking at these figures another way, one in every three American workers had a job in industry in 1951, compared with about one in every ten now. In the US, like most other advanced economies, you're more likely to get a job in retailing.

What do all these facts mean? They should help us put announcements about job losses in perspective. First, the net rates of job loss or creation are tiny compared to the gross turnover. In a typical year and a typical economy the net increase or decrease in total employment is about a fiftieth of the workforce, equivalent to about 2.6 million people in the United States. But in a similarly typical year a tenth or twelfth, about 12 million in the US, will change their job.

There is no such thing as a typical year, of course. These averages smooth over the ups and downs of the **business cycle**. Almost all the job losses are bunched into **recession** years. Often job losses are announced in big batches, too, when a company closes down a whole plant or call centre, or decides it must axe a tenth of its workforce. On the other hand, jobs are created more evenly but more of them in years of economic expansion. Between 1991 and the start of 2001 the US experienced the net creation of 25 million jobs. Between then and mid-2007 another 6 million net new jobs were created. For the UK (with a population of about 60m as opposed to 250m) the net job creation over the same periods was one million and 1.6 million. Some other countries have fared much less well in their ability to create jobs, including the major continental European economies, but the pattern over the business cycle is similar.

This is the human face of the **creative destruction** of capitalism, in the famous phrase coined by Joseph Schumpeter. Some jobs and companies are destroyed, others, and more and more of them over time, are created. After all, the US workforce has risen from just under 30m in 1939 to 47.2m in 1951 and about 137m in 2007. It has nearly trebled during a half century which has brought dire warnings about jobs being destroyed by technology, by overseas trade, by the government, you name it. Such alarmist stuff flies in the face of more than 200 years of economic expansion in the developed world. Things have certainly gone very badly wrong at some points, with the Great Depression in the 1930s in the US (the 1920s were worse in Europe), the American civil war and almost constant war in Europe culminating in two world wars, not to mention the economic calamity of communism. There are also persistent unemployment problems for specific groups such as black men in inner-cities in the US and elsewhere, or young people in France, reflecting social and institutional hurdles to employment. However, these

vulnerabilities do not overturn the point that doom-laden prophecies about the end of work are highly unlikely to be true.

It isn't work as my parents would understand it, of course. They both started work in the cotton mills of northern England (interrupted by the diversion of the second world war). The hours were long, often involving unsociable shifts, the work was arduous and boring, the conditions were grim in the hot and noisy mills, and the pay was low. Still, they both escaped into other jobs, my mum as a clerk for the social security department, my dad checking meter readings for the electricity company, and they were doing better than their parents. Their children did better yet. We all sit at desks and tap away into computers, in quiet air-conditioned offices, earning a decently bourgeois income. If we hadn't gone to university and become professionals we might have got clerical jobs or be working in shops. Or trained in some skill like plumbing or hairdressing and be running our own businesses. There are still some utterly lousy jobs, but fewer jobs are really lousy now. This pattern of improvement in the conditions of work generation by generation is a common story of our times. I have to admit that when I hear about another textile mill closing because of the pressure of competition from overseas or because of investment in new equipment, I'm quietly pleased at one level. Boring, repetitive, uncomfortable jobs are surely jobs best done by machines. If the economy is raising living standards over time and at the same time making the ways we have to earn our living typically so much more pleasant than in the past, that's great by me.

This is the big picture. How it happens in practice is painful. Business cycles are not the smooth and regular expansions and contractions their name suggests. A recession is always a short, sharp shock. A lot of people lose their jobs at the same time and naturally worry about finding another. Often they have to take work at lower pay and on worse terms at such a time, if they can find another job. As redundancies also tend to be geographically clustered, that can be much harder than national average unemployment figures might suggest. What's more, people develop skills specific to the work they do, and those will not transfer easily. You can't work a loom one day and cut hair the next. Even if you are prepared to move to a different part of the country for work, it might well be the case that all the companies in a particular industry are in difficulty at the same time.

The trouble is that the people losing jobs and the people gaining jobs that are getting better over time are often different people. So the overall trend is not much comfort to anybody

who finds that they are the wrong kind of person for today's economy. When the structure of the economy is changing rapidly, as it seems to have been during the past decade, a lot of the workforce can feel very insecure without any apparent objective reason for it.

There is a clear policy lesson here. Contrary to almost any public debate you'll ever hear, it is not 'jobs' but people that matter. Governments should not make it their business to preserve specific jobs in particular industries and companies. That's a mission doomed to eventual failure. Could government policy have saved the horse-drawn carriage building business and all the jobs tied up in that? Should it have even tried when we know with hindsight that the automobile industry would create hundreds of thousands of jobs in the decades ahead? Clearly not. Governments have no special talent for predicting which technologies will succeed, how the terms of trade will change, what skills the economy will need and what specific jobs might be created. Economists would be the first to admit they can't make those predictions either - after all, we can't even forecast GDP growth next year or next quarter with any great accuracy.

Could and should government policy help specific individuals through episodes of structural change? That's a different matter. It seems to me an entirely valid aim of the education system and the social security system to equip people to adjust to recessions and waves of industrial change. Governments could even devise radical new policies if they start thinking about the people - for example, grants to move home out of a declining area, apprenticeship schemes for older workers who need to retrain, employment guarantees and so on. It's the workers who matter, not the factories or office buildings, not 'the industry' (actually a nearly-meaningless abstraction), not even the corporate shareholders.

It's pretty clear that most governments do not have very good policies for helping people. The picture varies from country to country, but in general there is not much lifetime income and employment mobility. In other words, somebody with low skills and a bad or insecure job is unlikely to escape from the path of low pay and intermittent unemployment. What's worse, the trap is being passed from generation to generation. For example, in declining rust belt areas where factory or shipyard closures have put a generation of men out of work, there is also a high rate of unemployment and poverty amongst their children.

These generalisations hold true for the US even though it enjoys much greater social and geographical mobility than the European countries or Japan. But the picture is worse in those

European economies which have had through the 1980s and 90s high unemployment rates and little or no growth in employment outside the public sector. Much as many Europeans resist the idea, it's clear that long-lasting high unemployment rates of 10% or more in some countries are a price paid for a high degree of protection and high social benefits (like pensions and sick pay) for the 90% who do have jobs. It's expensive to employ people in parts of Europe, and expensive and difficult to destroy jobs, so fewer of them get created in the first place.

That leaves stubborn pockets of unemployment and poverty, or 'social exclusion' in the vogue European phrase, which pose a thorny problem. They are clustered often in areas of bad housing, high crime rates, an active illegal drugs trade, high rates of chronic ill health and disability, and high proportions of ethnic minority or immigrant groups. In other words, the people concerned are likely to face not one or two difficulties, nothing so straightforward as not having a job, but a whole host of problems. This net of difficulties, cemented in place by lack of transport, bad schools and hospitals, and malign social norms, would trap even the most able and energetic person. No wonder governments have made little headway.

Yet part of the explanation for the policy failure must be that few policy-makers have thought of the people as the policy target. The policy debate, at least until very recently, has been conducted in terms of abstractions like 'jobs' or 'industries'. Companies form lobby groups to persuade politicians to protect their industries from foreign competition or introduce tax breaks or whatever.

Preserving jobs is often one of the arguments deployed by these lobbyists. That might even be a beneficial side-effect of whatever policies the government is persuaded to introduced. The US textile industry, for example, might employ more people than it otherwise would had it not so successfully campaigned for protection from imports. (Of the \$25 billion revenue raised by tariffs on imports into the US in 2006, fully \$11 billion came from tariffs on clothing and footwear.) However, fewer other jobs will have been created as a result, not even in the US clothing industry itself, because consumers will be paying higher prices for their clothes and shoes. Actually, the jobs saved could well be specifically those of executives in the companies concerned, but the main aim of industry lobbying is to safeguard profitability.

Of course a thriving economy does need profitable industries, but there is nothing to tell us which industries they need to be. I have no doubt that a century ago the horse-drawn vehicle

industry did everything in its power to lobby governments for assistance but, alas, it had become fundamentally unprofitable as consumers opted for trains, automobiles and eventually planes instead. You might imagine the fibre optic cable industry would be a good bet for future long-term growth, but there is no need to help it create jobs if it is a fundamentally profitable business. The trouble with trying to pick winners as a matter of policy is that an official sitting in the capital city trying to figure out growth industries of the future is almost certain to get it wrong, in which case they will be creating a lot of vulnerable jobs, not a sensible policy. Or they might just get it right, but in that case private industry will create the jobs without any government help.

So it should not be an aim of public policy to preserve specific jobs. The right aim is creating a climate for the creation of many jobs, preferably in fast-growing sectors where pay and conditions will typically be good, and equipping people to fill them whatever they are. Doing so was the great success of US governments in the latter decades of the 20th century, and not doing so the great failure of many European governments, which will find they have created a stubborn legacy of unemployment for a large minority of their people.

I do hope, however, that the job of ‘delay attributor’ in the British rail system doesn’t survive for too many years. Now there’s a case where the government could wisely set out to destroy jobs.

PART V. There's a world out there: Globalisation isn't all globaloney

No guide to economics could ignore one of the main developments in recent history, globalisation, or the increased extent and depth of the economic links between people in different countries. There were episodes of globalisation in the past, but ours has brought new challenges demanding new responses. Indeed the failures of globalisation have played a big part in ushering in a frightening era of political instability and war.

Although the common perception is that economists have not covered themselves in glory in analysing globalisation and solving the world's problems, economists talk a lot less globaloney about globalisation than many. That might not be saying much but it's a start.

Chapter Sixteen

Disease: *No Man is an Island.....*

.....entire of itself; every man is a piece of the Continent, a part of the main.....Any man's death diminishes me, because I am involved in mankind; And therefore never send to ask for whom the bell tolls; it tolls for thee.

In this famous passage from one of his *Meditations*, John Donne, the metaphysical poet, insists on our connection to each other through our common humanity. Writing in the 17th century he could have had no idea of the human capacity for mass slaughter, yet the huge numbers of deaths we have grown used to in the context of war, starvation, disaster and disease do not diminish the strength of his argument. On the contrary, globalisation is linking us together in an increasingly tight weave. As Adam Smith, the founding father of economics, observed: "No society can be flourishing and happy of which by far the greater part of the numbers are poor and miserable." This is no less true for a global economy than a nation.

One of the most direct results of globalisation is how much more likely we are to share diseases, with the explosion in foreign travel. Tuberculosis has re-emerged in western cities, cholera is in danger of once again becoming epidemic. And then there is Aids, a disease that originated in Sub-Saharan Africa and spread worldwide in the early 1980s. Even animal diseases spread more easily. The re-emergence of the foot and mouth virus, endemic in many parts of the world, which triggered the slaughter of millions of British sheep and cows in 2001 was traced to illegal meat imports.

All diseases are more prevalent and more often fatal in developing countries. For they have inadequate public health systems, people are less well-nourished and therefore less able to resist infections, cannot easily afford medicines, and the climate makes disease control harder. But beyond that statement of the obvious, does economics have anything to say about epidemics? The answer is yes, as soon as you understand that a healthy population is a **public good**.

A public good is something that benefits everybody. It is also something that each of us as individuals has too little incentive to acquire. A clean environment is a classic example. Everybody benefits but if it is left to individual citizens or companies to keep the air and rivers clean there will be too much pollution. Why would I bother with the cost of cleaning up the

emissions from my factory if my competitors might not? They could free ride on the back of my efforts without incurring the same costs themselves. The government needs to force all factories to meet minimum standards. National defence is another example. We all like to go to sleep secure in the knowledge some rogue tyrant will not be able to fire long-distance ballistic missiles at us, but how much would we each pay towards defence if it depended on voluntary contributions? As much as the price of a movie ticket once a week? Certainly not enough to build a National Missile Defence system.

To get back to diseases, public health is a public good. Disease control not only benefits those who are ill, it makes everybody else less likely to fall ill in the future. Yet as individuals we would not want to invest enough to guarantee public health: why should I pay anything towards somebody else's health unless I have to? Any direct personal benefit is hard to pin down, and I would also be suspicious that other people would not pay their fair share towards my health and well-being.

What's more, in a globalised world where international travel and trade are commonplace, public health is a **global public good**. It will be a benefit to anybody in any western city if fewer poor Africans and Asians have TB, because it will reduce the risk that you or I catch the disease. Several cities in the US and UK have seen TB outbreaks in recent years, some occurring in schools. And besides, the healthier and more prosperous are the populations of developing countries, the bigger the market for our exports, Adam Smith's point on a global scale.

Even though the concept of disease prevention as a global public good is new, the need to develop effective public policies is urgent; Aids, tuberculosis and malaria kill more than 6 million people each year. Many more people are too ill to work or care for their families.

One proposal made by economist Michael Kremer in 1997 suggested trying to create vaccines against such common developing country diseases, which would cost no government money at all unless a successful vaccine were to be developed. Government policy makers were slow to respond: it was not until 2000 that the United Nations agreed to set up a fund to tackle HIV/Aids, tuberculosis and malaria, and it was not inaugurated until April 2002, even then with only a fraction of the money it would probably need to succeed. Fast as this was in terms of the UN bureaucracy, private donors like Ted Turner and Bill and Melinda Gates were much faster in

earmarking money for preventative health care. For example, the Gates Foundation financed the Malaria Vaccine Initiative in 1999. Yet the economics-based proposal for creating a successful vaccine, has taken almost a decade to catch on amongst policy-makers.

It is a simple enough idea: that world governments, whether singly through their aid budgets or together through the World Bank or United Nations, or private philanthropists for that matter, promise to buy a certain number of doses of an effective vaccine for any of the three main plagues of the developing world: malaria, tuberculosis and the strains of HIV prevalent in Africa. The commitment would ensure a market of sufficient size to make a new vaccine profitable for its developer. While governments would have to spend money upfront to reduce the prevalence of disease, if a successful vaccine is developed, they would no longer endure the continuing financial and economic burdens of illness and premature mortality.

Aside from the potential gains to the developed countries from preventing the spread of diseases, the potential economic benefits to poor countries of an effective malaria vaccine, for example, are huge. According to World Health Organisation estimates, there are over 300 million clinical cases of malaria a year, and 1.3 million deaths. Almost all the malaria cases occur in the developing world, and 90% in Africa, although global warming is helping spread malaria to new regions. Children and pregnant women are most at risk. There is also increasing resistance to the drugs currently used to treat the disease. The impact on the workforce and productivity is a drain on the economy, and also ties up precious healthcare resources. UN and World Bank estimates suggest malaria alone slows growth by more than 1% a year, which is staggering. If correct, it means the elimination of malaria 35 years ago would have given Africa a level of GDP some \$100 billion higher than the current \$700 billion.

Other diseases add to the drag on the economies affected. HIV/AIDS, for example, mainly affects people aged 15-49, the most productive age group and those on whom many family members often rely. Gold Fields, the South African mining company, estimated that the 26.5% rate of HIV/Aids infection amongst its workforce was adding as much as \$10 to the cost of producing an ounce of gold. In early 2002 it therefore announced it would pay for treatment, despite the high cost of anti-retroviral drugs, in order to reduce the Aids tax on gold production to about \$4 an ounce. According to the United Nations, by the end of 2006 39.5 million people worldwide were living with HIV/AIDS. The toll from such diseases is one of the most serious issues in international development now.

Yet although this looks as though there should be a large and attractive potential market for a drugs company to target, it is one subject to severe market failures. For one thing, individuals have inadequate incentives to take vaccines as the individual risk of infection is often low but the cycle of infection is only broken if most people in a population are vaccinated. The social benefit is greater than the individual benefit. So the size of the potential market, without government intervention, is probably a lot smaller than the number of cases might make it appear. This is true of every vaccine, which is why governments either require or strongly encourage citizens to get their children vaccinated against measles, say.

In addition, the main beneficiaries of vaccination are often children. They will reap the economic benefits of not catching the disease as healthy adults earning money, but cannot earmark those future incomes to promise to pay for the vaccine when they are five. Parents are a good but not foolproof way of extracting today a child's future income; their heart is usually in the right place but they are generally poorer than their offspring will be if he or she grows into a healthy adult. Indeed, as most residents in Sub-Saharan Africa are too poor to afford an insecticide-treated mosquito net (often scandalously subject to high import duties by their governments) for their children, they'll be much too poor to pay for vaccination.

Thirdly, consumers are often more willing to pay for treatment of a disease than possibly unproven methods of prevention. It takes time for the effectiveness of a vaccine to become apparent, and always involves a bit of an act of faith.

So an HIV vaccine, for example, would clearly be a global public good. The social benefits of bringing it to market will exceed the likely private gains. That means that private sector companies are underinvesting in its development. Without government involvement they will not recoup enough revenue to make the amount of investment the world really needs worthwhile. Indeed in 1998 the global total for research and development into potential HIV vaccines was only \$300m, most of it publicly-funded basic research rather than applied vaccine development. Of this total only \$5m was earmarked for research geared towards developing countries. Without an additional stimulus, an effective vaccine is many years away, even for the rich markets and certainly for the poor ones.

The development of a new drug is expensive because of the very large scale trials required and the length of time between the initial discovery and the first sales. When you also consider the political uncertainties surrounding anti-HIV policies and the challenging delivery of medicines in developing countries with weak health services, and it is clear why pharmaceuticals companies have not really been interested. The current market for vaccines in developing countries in fact amounts to just \$200m a year - too small to make any drugs company think it worth bothering developing new products for the market.

On top of all these influences driving a wedge between the social benefits and the price individuals are willing to pay, there is a further problem in the fact that it is governments or public health services that, for the most part, buy vaccines. They are often tempted to use their purchasing power, or their control over patents, to force drugs companies to sell at a price that is not high enough to cover the research and development costs. In effect, many developing countries have in the past expropriated corporations' **intellectual property rights** that are supposed to be protected by patents.

This explains why big pharmaceuticals companies in 2000 launched a case against a South African law that would have allowed the government to buy cheap copies of patented drugs needed to treat Aids. After a high-profile campaign by organisations like Oxfam and Médecins sans Frontières they dropped the case, realising belatedly that taking Nelson Mandela to court in what looked like a bid to prevent South Africa tackling Aids was disastrous public relations. But the issue remains a real concern to pharmaceuticals companies.

There is a genuine policy dilemma with regard to patents. A patent gives the maker of a drug a temporary monopoly, even though consumers would be better served by enforcing competition which would lower the price. Better off short term, at any rate. For longer term, no pharmaceuticals companies would bother spending on the huge upfront investment needed to create new drugs. Patents are necessary to create long term incentives to innovate. There's no way to be sure in theory what the right balance is – it's an empirical matter.

But while some patent protection is desirable, there is no reason why the big drugs companies should expect to have the same degree of monopoly power in all new markets that open up. If globalisation is expanding their markets, they should expect to share the benefits by charging a lower price for their drugs in developing countries. The only valid concern they might

have about that is whether the drugs might end up being shipped back into their home markets at the lower price, but that is a worry shared by many industries now.

However, it would be worth overcoming these difficulties in order to get an effective vaccine against scourges like TB, malaria and HIV. The typical price of a dose of an on-patent vaccine sold in a developing country is \$2. Calculations by economists at Harvard suggest a programme of malaria vaccination would still be cost effective - compared to the healthcare costs and economic losses imposed by the disease - at \$41 a dose. That \$39-a-dose gap is a measure of the social gains that could be captured by a programme giving researchers the right incentives to develop an effective malaria vaccine; they add up to as much as \$1.7 billion a year forever at today's prices.

The beauty of the proposed scheme to fund vaccine development via an international government guarantee is that it guarantees a big enough market to make medical success worthwhile for the private investors who would still be funding the research. The fact that the public purse pays nothing unless a viable vaccine is developed gives researchers the incentive to succeed rather than, say, concentrate on work that will enhance their academic reputation. The programme, linked to the international aid effort, would also guarantee that the vaccines got to the people who really need them. And, involving no public spending until it succeeds, the vaccine guarantee proposal does not divert resources from current aid budgets, a problem with alternative proposals such as direct government funding of the basic research.

A Global Alliance for Vaccines and Immunisations was formed in 2000, by the World Health Organisation, Unicef and the World Bank, along with a number of philanthropic foundations and research institutes. By 2001 the rich countries had agreed in principle to fund vaccine development, through the World Bank. By 2006 they were close to agreement on the money. This is a proposal whose time is nearly here, after its long gestation.

The idea's applications extend beyond developing countries and beyond diseases, however. There are many areas of public spending in which governments could pay the private sector by results for its innovations, thus getting round the classic problems of public sector management. If government is notoriously bad at "picking winners" and inefficient at management, why not set the private sector the problem and leave it to solve it? It is a question of creating an appropriate economic incentive. The government has to be involved in the case of

public goods because there will by definition be too low a return to purely private effort. But if the reward for success has a government guarantee and the reward for failure is zero, success is a pretty likely outcome.

This reasoning about the power of incentives explains why economists are so keen on applying market solutions to environmental problems. A clean environment and natural resources are public goods whose benefits are cross-border: those who bear the costs of cleaning up pollution or gas emissions are often in a different country than the people who will benefit. On the global scale, financial stability, free trade and knowledge have also been identified as public goods, those that create spillover effects whose benefit to society is greater than the private benefits, and whose social gains also spill over national borders.

The idea of global public goods is a powerful one for identifying issues where government involvement at the global level might be necessary to ensure enough of the benefit in question is produced. That could be public health, reduced emissions, international postal and telecommunications links, shipping rules or financial stability. The fact that some of these goods have had international governmental institutions supplying them quietly for a long time, whereas others are buffeted by controversy, suggests there are difficult questions in some cases. For one thing, economists have to work out how much of the public good might be the right amount. In telecoms the aim is clearly a set of rules enabling people to make calls abroad and setting the charges for operators to access each others' national markets. But what about public health? Obviously more should be spent on developing vaccines but how much more? And who should pay? Should funds be diverted from other development spending and loans? Even trickier, in the absence of a global government, designing institutions to raise the money and deliver the goods is a major institutional and political headache, not to mention a challenge to economists.

Chapter Seventeen

Multinationals: Sweatshop Earth?

It is easy to condemn multinational corporations – easy, but in the end wrong.

The taste of chocolate is very bitter, it turns out. In the spring of 2001 the news emerged that much of the chocolate made by big confectionary companies and consumed by us in vast amounts is made from cocoa farmed by child slaves in west Africa. The children are sold to traders by their parents in desperately poor countries such as Benin and shipped to other poor and desperate countries like Cote D'Ivoire to work in the cocoa plantations. One such slave trade shipment was uncovered by the United Nations Children's Fund. One can only begin to imagine the harsh conditions and treatment the children are likely to experience working in a foreign land with no protection, not to mention the sheer loneliness and fear.

This was, unfortunately, just one example in a long line of revelations about working conditions in developing countries, whose workers are employed either directly by multinationals based in the developed countries or by local subcontractors to the multinationals. Whether it was children stitching footballs in the Indian sub-continent or young women in factories making sneakers or clothes in Bangladesh or even relatively affluent Mexicans working in auto and electronics plants near the border with the US, evidence of the extent to which our consumer comforts depend on cheap labour overseas has made many of us uncomfortable. What's more, consumer protest has already proven quite effective in making multinationals pay much closer attention to working conditions way down their supply chain, and big companies pay much more attention to these issues than they used to because of the risks to their reputation. That there are still frequent news stories about child labour or dismal factory conditions is testament to how hard it is to monitor and control what suppliers in distant countries are doing.

Giant international corporations have never exactly been popular, but their stock is particularly low at the moment. Naomi Klein, the Canadian journalist, has hit the best-seller list with not one but two passionate tirades against multinationals, capturing the widespread sense that the big, bad guys are taking over the world economy, and that globalisation represents the success of faceless and unaccountable private corporations in running the world in their own interests.

The trouble is that this left-of-centre conspiracy theory is not entirely supported by the facts. It is very easy to track down some basic economic information published on the Internet by organisations like the United Nations and OECD that at the very least suggests the need for a more nuanced interpretation of globalisation.

The basis of the argument, that companies are becoming more powerful, governments less so, is not true. The rhetoric since the era of Ronald Reagan and Margaret Thatcher has suggested that governments are getting smaller. In the 1980s the UK's Prime Minister Mrs Thatcher launched privatisation – the sale to private investors of government-owned companies – on the world, and many countries followed the British lead in transferring big state telephone and electricity companies to the private sector. Despite this big move of companies from the public to the private sector, the government takes a bigger share in the economy than ever in most countries.

For example, in the US the share of government expenditure in Gross Domestic Product (GDP) was 34% in 1995, a little higher than it had been in 1980 when Mr Reagan was first elected. In the UK Mrs Thatcher stabilized the government's share of the economy at about 40%. In both countries, which supposedly saw a political revolution to roll back government, the proportions remained by the mid-1990s significantly higher than in the mid-1960s, when big government social programs started to unroll. The government's share has actually risen again in the UK to reach 44%.

Elsewhere in the developed world the share of government spending in GDP has been rising for the past 20-30 years, very substantially in some cases. In a group of northern European economies, government makes up 50-60% of the economy. The government share has also increased in many developing countries, especially those in the middle income ranks, thanks to the introduction of state-funded education and welfare programs as these countries have become richer. Greater prosperity means people demand more and more from their governments in terms of public services.

In fact, the only group of countries in the world where there is clearly smaller government now than 20 years ago is the ex-communist block. These economies were almost 100% government-owned and run in 1979. By 1999 they had transferred 40-80% of the economy into private hands, so the Czech Republic and Poland now have (slightly) smaller governments than

the UK and France. While there are big question marks over the process of transition from communism to capitalism in most cases, few people would argue it was wrong in principle to give the private sector a lot more say in those countries.

So in a very fundamental sense, private corporations do not have a bigger role in the global economy. They are not even paying less tax. Although headline tax rates have declined, in a competition between major economies to attract and retain international investment, the amount of tax paid by companies has in some cases risen, and the share of total tax revenues paid by companies has been stable since 1980. So the evidence doesn't back up the claim that multinationals (as a whole) can play governments off against each other to cut their tax bills. A lot of the enthusiastic free market rhetoric has been just that: rhetoric, not reality.

What, then, is the reality? The answer is not privatisation but globalisation. Two aspects matter in explaining the demonisation of multinationals. One is the growth of international investment and sales by corporations. The other is the impact of a more open world economy on government policies.

Companies are increasingly not just marketing more and more of their goods across national borders, reflected in the continuing growth of imports and exports, but manufacturing more internationally as well. This is revealed by figures for **foreign direct investment (FDI)**, which means investment in companies and factories in another country. It is not the same as portfolio investment in property, shares and other financial assets, often described as 'hot money'.

Worldwide flows of such direct investment from one country into another have climbed from just \$30 billion a year in the early 1980s to \$800 billion in 1999 and nearly \$1 trillion in 2005. As a share of world GDP, this is a more than fivefold increase, to 12% in 2005. The sales recorded by the foreign affiliates of multinational companies have risen correspondingly fast.

Most cross-border investment takes place between the developed countries, between two-thirds and four-fifths of the total each year. Countries such as the Netherlands, UK, Ireland and Australia are amongst the world's most open to investment by overseas companies. The most open developing countries include Singapore, Hong Kong, Panama and Trinidad and Tobago, and about two dozen countries account for almost all of the investment flowing from the rich to the not-so-rich nations. Hardly any FDI flows into the world's poorest countries.

However, those foreign affiliates in countries like Indonesia, China, Malaysia or Honduras that do attract a lot of inward investment by multinationals are increasingly making and exporting manufactured goods back to the rich markets. This is a significant change in the structure of their trade. As recently as 1990 only 40% of developing country exports were manufactured goods, with most of the rest either agricultural produce or commodities, but by 1998 nearly two-thirds of their exports were manufactures, and the proportion had jumped again to over three-quarters by 2005.

Perhaps this is the true underlying source of consumer concerns in the rich countries. It is clear that companies are transferring production overseas, a move made feasible by both new communications and computer technologies and by the slow but steady reduction in import duties on manufactured goods, because it is a lot cheaper. Why would they bother otherwise? The whole point must be to get away with paying exploitation wages. Or is it?

Labour costs make up about two-thirds of the total cost of manufacturing some low-tech goods (although much less in other cases), so there can't be much doubt that low wages in developing countries are attractive to corporations. So too with less stringent environmental standards.

But companies do not invest in the cheapest possible countries. In fact, they opt for middle-income countries such as China or India, Mexico or Malaysia. There is in addition overwhelming evidence that in most cases – not all – multinational investment in a low-wage country is good for the corporation and the workers. One survey of the evidence on working conditions in developing countries published by the OECD has a bibliography running to nine pages. The evidence was overwhelmingly that pay and conditions in factories owned by or working for multinationals based in rich countries are better than general local conditions. Even the controversial export processing zones some countries such as Mauritius and the Philippines have established specifically to tempt foreign investors with special tax and legal breaks have better standards (higher wages, more unionisation, shorter hours) than most alternative local jobs.

In some cases the jobs created by foreign corporations have been taken mainly by women. Female workers are even cheaper than male workers and have additional qualities such as greater manual dexterity in assembling bits of microelectronic circuits or cutting and sewing

garments. Is it any surprise that local men in quite traditional societies object to women acquiring greater economic independence and sometimes bringing home more money than anybody else in the household? For young women in rural China or even northern Mexico, however, a job in a foreign-owned factory is a form of liberation.

Similarly, caution is needed even before condemning the use of child labour in poor countries. Western consumer boycotts of soccer balls made by children in Bangladesh and Pakistan meant the children lost their jobs. Their parents sent them, not to school, but out to worse-paid jobs in other industries. Some ended up in prostitution. Banning some kinds of child labour is highly desirable, but after, not before, a source of replacement income for their families is identified and school places are funded. It should also be remembered that the figures include some kinds of child labour no-one objects to, including paper rounds and weekend jobs.

There is absolutely no doubt that parents stop sending their children to work (or selling them into slavery) as family incomes rise. In the poorest countries with incomes under about \$300 a head 10-12% of children work, compared with less than 2% in countries where average incomes are above \$5000 a head (remember, we still think children should do some work, whether tidying their bedroom for pocket money or delivering newspapers or working in a shop on Saturday afternoons). Most children work in agriculture, not in factories, often on family smallholdings. Adults tend to grab the factory jobs because these pay so much better. Figures from the International Labour Organisation suggest the number of children working has been in decline in recent years.

A pilot World Bank scheme swapping food for school attendance may point the way to short-term reductions in child labour, but the best solution would be higher incomes. That means economic growth in the poorest nations. And selling exports is the best way, perhaps the only way, for an economy to grow.

That doesn't mean conditions are great in multinational-owned factories producing for export. And there are also many exceptions to the general rule that conditions are better than the local norm, concentrated in traditionally awful industries like clothing or gem-cutting. It's no wonder that local workers are pressing for higher pay and better conditions – after all, so are workers in many developed countries. In fact the sooner only robots work in factories, the better for humankind, because most are basically awful jobs, repetitive, hot, noisy and even dangerous.

Nevertheless, the past decade's surge in foreign investment, building up a manufacturing base, represents a source of greater prosperity in developing countries. Those wealthy multinational executives so criticised by campaigners have brought more jobs, more money, more technology, more exports, more prosperity to developing countries. That's a lot more than the often corrupt and inefficient governments of such countries have achieved.

Where there is much greater controversy amongst economists about multinationals investing abroad is what impact it has on their home country. After all, switching production to cheap labour countries implies direct job losses in expensive labour countries. Corresponding to the increase in exports of manufactures by developing countries has been the decline of manufacturing's role in the developed economies. It is hard to believe the globalisation of production has not cut jobs and wages at home. This was, of course, the great fear about Nafta, that Mexicans would be putting Americans out of jobs, although the 1990s was in the event a great decade for employment in US industry.

Employment in manufacturing in the US and EU has fallen sharply since the late 1990s. Foreign direct investment and overseas trade will have contributed to net job losses in some developed economies, but it is hard to attribute to globalisation all the responsibility given the sheer scale of job losses in manufacturing. Manufacturing's share in the US and UK economies had reached a peak in the late 1960s, and in more highly industrial countries like Germany in the early 1970s. That turning point long predates any noticeable volume of exports of manufactures by developing countries. Even the 'Asian tigers' like Korea and Malaysia, which are now substantial exporters of manufactured goods, only accounted for a minuscule share of world trade in manufactures before the 1990s. As Paul Krugman pointed out in a famous article republished in his book *Pop Internationalism*, imports from low-wage countries accounted for 2.8% of America's GDP in 1990, compared with 2.2% in 1960. How could an increase that amounted to just over half a percentage point of GDP have caused a 10 percentage point decline in manufacturing output's share in the economy (from 29% to 19% of GDP)?

Many subsequent studies have backed his conclusion that the scale of trade with developing countries is too small to explain by itself the scale of economic change in the developed countries. A majority of economists therefore believe that although globalisation is now playing a significant role, the introduction of new technologies triggered the shift away from manufacturing in the advanced economies. In fact, the transfer of production overseas is more

likely to be a symptom of underlying structural change – the information and communication technologies – than a cause.

Still, symptom or cause, exploitative or not, multinationals do play a bigger part in everybody's lives. No matter where you live, you are more likely now than 10 or 20 years ago to buy a product made by a foreign company or work for one. Many items we buy have parts that have been made all over the globe. Foreign corporations have displaced not government but rather domestic corporations because of the increasing globalisation of the economy.

However, there is one sense in which globalisation has had an impact on government. It sets some limits on some government policies. Not, as we have seen, on the size of *government*. Sweden, whose government accounts for nearly 60% of national output, has no trouble attracting investment or borrowing money in the financial markets. However, the need to convince foreign investors, more sceptical than home investors, does limit the size of *government budget deficits*. Any country with high inflation, a big government budget deficit and a big trade deficit will find it more expensive to borrow from overseas or attract direct investors. In extreme cases, a macroeconomic basket-case country will find it is experiencing a financial crisis when anybody who can get money out, foreign or national, does so. As Argentina for example has discovered in its traumatic few years, globalisation rules out bad macroeconomic policies.

More controversially, the Asian crisis in 1997-98 suggests it is starting to rule out really bad microeconomic policies too. Foreign investors in that case were reacting to shaky banking systems and an unknown degree of corruption, rather than excessive inflation or government borrowing. When foreign investors seem to be wielding a power of veto over detailed economic policies or even the local style of doing business, it could look as if multinationals were trying to usurp the role of government (not that the democratic credentials of all the affected countries were of the highest order in the first place). Personally, having little confidence in the proposition that politicians and officials know best, I'm perfectly happy if economic good sense means governments are prevented from running stupid policies. You don't have to be a free-market fanatic to believe this: I'm very much in favour of governments having policies and intervening to make the economy work better, but would prefer good policies to bad ones.

There is a genuine issue about democratic accountability. But there is nothing new about powerful corporations trying to influence government policy. It would be naive to think it didn't

happen in the past just because we didn't know about it. Big companies pay big bucks in direct political contributions and also hire lobbyists whose job is to help shape policy in the most favourable way by taking officials and elected politicians out for fine meals or rounds of golf, or hinting that a decision on a factory closure could be swayed by a helpful vote from the local representative. Perhaps it's me who's naive, but I think there is a bit less of this going on. The ubiquitous media and the Internet have made it much harder to keep channels of influence secret. The press is more likely to whip up a scandal about political donations.

In fact, the much greater scrutiny of corporate activity means multinationals themselves think they have less influence, not more. Some only pay lip service to concerns about their environmental policies or the working conditions in their third world factories, regarding it as a matter of public relations. But others are starting to take consumer and activist complaints seriously because they recognize that damage to the corporate reputation can and does affect their profits and share prices. They don't handle it at all well, on the whole, but that's only human. We all react rather badly to criticism, especially when we've been making a real effort.

For both multinationals and governments – for all of us, in fact – globalisation has brought mixed blessings. Companies have the opportunity to produce more cheaply and efficiently but also face more competition and more complications in doing business. We gain as consumers from lower prices and more choice, and from faster economic growth overall, but some of us lose as employees as industries and jobs decline. Governments have less power in some directions, more opportunities in others. It is easy to spot the difference between right and wrong when it comes to a slave ship packed with children plying along the African coast, but for the most part there is no clear sightline between where we are now and the safe harbour of an ideal world; we can only try and figure out how to get from here to someplace a bit better.

Chapter Eighteen

Immigration: The missing link

Every week, more or less, brings a ghastly piece of news. Three hundred young men drown when a rustbucket of a boat ferrying them from Albania sinks off the coast of Italy. A truck trailer in El Paso, Texas is found to contain the bodies of 41 young men and women, including a baby. A container truck sailing into Dover in England holds a cargo of tomatoes and the bodies of 58 suffocated Chinese men and women. These are just the large-scale incidents. Daily there are individual deaths, of Africans trying to cross the Sahara on foot to get into the Spanish enclave of Ceuta in North Africa and then in an unseaworthy boat crossing into mainland Europe, or frozen to death clinging to the undercarriage of an aircraft, or a Kosovar trying to cross the Channel to Britain clinging to a high-speed Eurostar train and falling onto the rails.

Unless we think these anonymous people are disposable, the daily incidents must force us to recognise that something very terrible is happening, and try to understand it. Clearly many would-be immigrants from developing to developed countries believe it is worth facing a significant risk of death to circumvent the barriers to their legal movement. What pressures drive them to this, and what are the implications of the current structure of immigration controls?

The final years of the 20th century brought a significant increase in the numbers of people crossing international borders, intensifying a slow upward trend that had begun after the second world war. The flow is predominantly one of people leaving developing countries to enter developed ones, or in other words out of Asia, Latin America and Africa into the US and Western Europe, but not entirely. There is also significant movement of people between countries in each category.

It is difficult to compare figures from different countries as they are collected in various ways. However, with that caveat, the OECD estimates that the number of foreigners legally entering France, for example, climbed from 44,000 in 1988 to 78,000 in 1997, and 140,000 in 2004 and the figures for the United Kingdom rose from 220,000 in 1988 to 288,000 in 1998 and 494,000 in 2004. The inflow into the US has remained high throughout the 1990s and 2000s, hitting a peak of 1.8 million in 1991 but not falling lower than 700,000 any year.

These far exceeded in absolute terms the numbers of immigrants in the 1900s, although they formed a far lower proportion of the total population, with under 10 % of the US population foreign-born compared to 15 % in 1900. Illegal immigration has also increased but of course there are no reliable statistics on it. It certainly numbers millions of people worldwide, possibly tens of millions.

Some countries saw also a substantial rise in the number of asylum seekers. These include Australia, Belgium, the Czech Republic, the Netherlands, Switzerland and the UK. As asylum seekers, fleeing war or famine, are by definition the poorest people on the planet and most in need of significant help from their hosts, they have aroused particular political hostility. Responding to this, some mainstream politicians in the UK even proposed interning people claiming asylum until their claims are assessed, a move lawyers have argued would breach the Geneva Convention and the European Human Rights Act. The legal opinion had little effect on the popularity of the proposals, according to polling organisations. We're talking hot button issues here.

To get a complete picture of the movement of people, it would be necessary to collect data on both inflows and outflows from every country on a consistent basis. This simply is not available. National data give some idea of the broad trends, however. One of the main sources of information for the UK is a survey of passengers entering and leaving at ports and airports, the benefit of being an island being that it's easier to count them. The number of Britons emigrating peaked in the early 1980s, when there was a net loss of population. The 1990s brought a net inflow, with increases in immigration from many sources: in descending order of magnitude: the rest of Europe; the 'Old Commonwealth' (code for mainly white countries like Australia and Canada); the 'New Commonwealth' (mainly Asian and West Indian); and 'other' (mainly from the US and China). Since the expansion of the EU in 2004, a particularly large inflow of about 600,000 has consisted of Poles and other central and eastern Europeans seeking work in the UK. Naturally, as in other majority white countries, the debate in the UK has a somewhat racist flavour. When populist politicians and commentators talk about 'floods' of immigrants and asylum-seekers they are not referring to the young Australians teaching in British schools or the Americans and French working in financial services.

Other countries have somewhat different patterns, determined by their geography and history. The largest numbers of immigrants into the US, which always has a significant net

inflow, come from the Americas and Caribbean, followed by Asians. Europe forms the third most important region of origin for immigrants into the US. This is a great contrast to 19th and early 20th century immigration, which was predominantly European and has contributed to a marked change in the ethnic composition of the American population.

However, although there has been an upward trend in the numbers of people on the move across borders, the past 20 years have still seen nothing on the scale of the great mass movement of people that occurred between about 1850 and 1914, put as high as 50 million compared to a world population of 1.8 billion in 1913, or almost 3% of the 1913 total. In 1912-1913 the US saw 3.3 million immigrants, when the country's population was 97.6 million, a 3.4% rise in the population due to immigration in two years. The 4.3 million immigrants in 1989-91, the three peak years in the recent inflow into the US, compare to a 1989 population of 248.8 million, or a 1.7% increase due to immigration in three years. The US is one of the countries in the world most welcoming to legal immigrants, not least because of the part the earlier wave played in shaping the national identity.

Indeed, although other measures such as investment and trade flows, or the extent of overseas production by multinational companies, show the globalisation of the world economy has now passed the benchmarks set in the wave of globalisation that occurred in the late 19th and early 20th century, the reverse is true in the case of immigration. The flow of people is the missing link in modern globalisation. The rhetoric applied to immigration is completely different in flavour. Pro-globalisers have no problem with the idea that goods, services and capital should be free to go anywhere in the world, but for some reason the same principle does not generally apply to people.

The forces of globalisation have contributed to the increase in the movement of people. Transport costs have fallen, and perhaps even more important so have information costs. Potential migrants are better aware of the rest of the world, of the opportunities, of what has happened to friends and family who have already moved, as it's so easy to chat via Skype or mobile. The more people move, the more family and personal ties will draw others behind them. What's more, as the rich countries have pulled further ahead of the poor, the images in the media of life elsewhere show a bigger gap than ever between what potential migrants have now and what is attainable elsewhere.

Another factor pushing migration has been an increase in military and political instability in many parts of the world since the end of the Cold War. Areas like Eastern Europe and Sub-Saharan Africa have seen a dramatic rise in the number of vicious conflicts, creating millions of refugees.

Factors pulling potential immigrants include the much greater fluidity in the international job market in many industries such as financial services or computers. On top of that, some countries like the US and UK enjoyed a long economic expansion from the mid-1990s, creating a lot of demand for workers. In some areas like Silicon Valley or the City of London there was a dramatic rise in the foreign-born proportion of the workforce during the 90s. That includes not just financiers and programmers but also cleaners and restaurant staff. The demand for foreign-born workers could also stay high despite an economic downturn, as the populations of some western countries are ageing rapidly, pointing to potential shortages of native-born workers. While numbers of migrants do ebb and flow with the economic cycle, there is no reason to believe the flows will cease. One reason is that many of the rich countries to which would-be migrants will move have stagnant or declining populations because of birth rates well under the replacement rate.

It is very clear that economic factors have been important in explaining the upturn in immigration, while deliberate government restrictions probably explain why the flows have not re-scaled the heights they reached (in proportionate terms) a century ago. Will controls on immigration be able to tame the underlying economic forces? And should they? This is where the economics tool-kit comes in handy.

A majority of migrants are of working age and seeking work. Their arrival therefore has the obvious effect of increasing the available **supply of labour**. Here lies one of the most common objections to immigrants: “they’re taking our jobs”. This is an example of one of the biggest chasms between economists and other people. Economists describe this as the “**lump of labour fallacy**”. The mistake is the assumption that there is only a fixed amount of work to go around, so if more jobs are taken by foreigners (or machines) there will be fewer left for the native-born (or humans). The fallacy has been completely discredited. It just doesn’t happen. For if it were true, almost everybody would eventually be unemployed, given that the population has until just about now grown steadily. The existence of some pockets of high unemployment, amongst blacks in inner cities for example, is not caused primarily by competition from immigrant workers, but by

the too-high expectations and too-low skills of the people in those groups. High jobless rates in such neighbourhoods are not correlated with numbers of immigrants.

What happens is that the arrival of immigrant workers shifts the **labour supply** curve out. For a given **labour demand** curve, the number of people in jobs will rise, but the wage will be lower. This is what induces employers to take on more workers. So in the short term immigrants do not take jobs but could reduce pay.

However, over a longer time frame the economy will grow as a result of higher demand from a bigger population, employers will create even more jobs, new businesses will form, so the labour demand curve moves out too. The weight of evidence suggests immigration rarely reduces wages in practice because migrants are moving to thriving regions with a growing number of jobs. What's more, at the bottom of the jobs pecking order, for janitors, child minders, care assistants and so on, it is often the case that native-born workers will not take such jobs at any wage that makes them worthwhile for the employers. The very arrival of immigrants can therefore actually create these lowly and unattractive jobs. Economies adjust to use the resources available to them, and if that includes a large supply of new workers, companies will create jobs that use them rather than creating jobs that use types of workers they can't find, or rather than investing in activities that depend much more on machines than people. The **capital intensity** and **skill mix** of the economy will respond to migration flows.

Even at this first step in the analysis it is clear that immigration brings benefits and imposes costs. Assessing its benefit to the national economy will obviously be a question demanding empirical research. It is not an issue that can be pre-judged. The costs are borne by groups of workers in direct competition for jobs, which tend to be the very unskilled and the highly skilled given recent immigration patterns. Countries allow in highly skilled workers most freely, and illegal immigration increases the pool of unskilled labour. The costs are not loss of work but potentially lower real wages, or lower growth in earnings, for some unknown time period.

The benefits go to employers in the first instance, but later spread to everybody as the benefits of the boost to demand kick in and the affected wages start to rise again. The balance of evidence suggests immigration puts little or no downward pressure on wages in practice, although it's hard to be definitive because we don't know what would have happened to wages otherwise.

For example, inflows of foreign IT workers have not depressed wages in the industry, suggesting the industry has grown more relative to the rest of the economy than it would have if the labour supply had been restricted to the smaller pool of native-born people with IT qualifications.

A further, and immediate, gain stems from the fact that the economy as a whole can grow faster without leading to upward pressure on inflation when there is a significant addition to the labour supply. That means the central bank can allow interest rates to be lower than they might otherwise have been. This certainly seems to have played a part – and again how big nobody quite knows – in the long economic expansions in the US and UK. The jobs markets in California and London would have overheated much faster without the influx of new workers from overseas.

There is a substantial body of research that shows that immigrants generally start out earning less than natives but eventually catch up and, for some groups, overtake. It's known as the **assimilation hypothesis**, and it holds true for the US and UK, according to evidence available from earlier waves of immigration. (Again, this might differ country by country.) This chimes with the observation that immigrants are often hard working and highly productive. To leave home, friends and family, everything familiar, braving unknown hazards on the way and for an uncertain future suggests that either they are desperate to improve their lot or unusually adventurous and enterprising, or both. And when they find a new home and job they tend to set about ensuring their children have all the advantages they themselves did not enjoy. Such people might start with lower skills than typical of workers in their host country, and will often need to learn the language, but are subsequently likely if anything to improve the average quality of the workforce. By the next generation, it is harder to distinguish between the children of natives and the children of immigrants in terms of how they do in the labour market on average.

Certainly, there is no evidence that immigrants are a bigger drain on public services than natives. While refugees will tend to need special help with housing, health care and welfare, for some time at least, economic migrants make fewer demands than natives. They want work, are mostly young enough that they need fewer than average medical services, and they pay taxes like everyone who goes shopping or has a (legal) job. Usually new arrivals are not entitled to many welfare benefits. The main difference will be in the case of immigrant groups with a higher birth rate, whose children will need schooling. Figures for the UK show immigrant groups receive more child and housing benefits than natives but less in unemployment benefits and state

pensions. A detailed Home Office study concluded: “On average and overall, *migrants are not a burden on the public purse.*” (Their italics.) Research carried out in the US and Germany reaches the same conclusion.

So on two of the main areas of the cost-benefit analysis, in which the balance could in theory tip either way, it looks like immigration brings at least no net costs and perhaps net benefits to the host economy. The balance will tilt towards net benefits to the extent that immigrants are filling jobs in which there are serious shortages of native workers. That includes many public sector jobs which are relatively low-paid by comparison with private sector alternatives. Thus many European health and education workers are foreign born. It also includes highly skilled jobs in industries such as software and finance.

However, that’s not the end of the assessment. We need to look at two other impacts. There is a general perception that immigrants are a drain on resources which must have some basis in reality. It arises because new groups of migrants tend to cluster together, often in deprived neighbourhoods where housing is cheap. Not only does this make their strange foreign ways highly visible, which in itself makes some natives uncomfortable, it also means the burden of finding houses and schools falls on relatively few local authorities and their taxpayers. It is in some cases associated with a higher rate of crime and drugs use, typical inner city problems. And more people, whoever they are, can put a burden on public transport, hospitals, police, social services and other bits of the physical and social infrastructure. These **congestion costs** are very real.

On the other hand, immigration has had a tremendous and probably incalculable positive impact on society and culture. To take one example, consider British cooking. As a lifelong consumer of British food, I can vouch that immigrants from the Indian subcontinent, East Asia, Europe (especially Italy but excluding Germany), the West Indies and Japan have had a fantastic impact on my well-being during the past quarter century. As a child and teenager I was restricted to the rightly notorious national cuisine of tough meat, overcooked vegetables and potatoes. But by the late 1970s the choice of alternatives had been vastly expanded by incomers. The curry – specifically the hybrid Anglo-Indian dish Chicken Tikka Masala – has become the staple fast food in the United Kingdom. There are about 10,000 Indian restaurants and take-aways, it’s estimated, employing as many as 70,000 people, and with a turnover of £1.5 billion. That’s more

than steel, coal and shipbuilding put together. This is not a frivolous example. It represents a serious improvement in consumer welfare. More choice is good for the economy.

The diversity introduced by immigrants has many other effects that are less easily quantified. However, they are highly visible. Immigrants often make hugely important contributions in cultural industries like music, fashion and art, in academia, in sport, in science and medicine. In short, they are important in the industries that are playing an increasingly important role in the advanced economies. There are many historical examples too. Would the City of London be the great financial centre it has become without Jewish immigration in the 19th century? Would American universities dominate the global intellectual landscape without the influx of refugees from the Nazis? Or would Silicon Valley be pre-eminent without Indian and Chinese brainpower? Diversity could be valuable in itself by introducing new ideas and fresh ways of doing business, all important in an economy where growth depends on ideas.

The point of all this is to indicate that assessing the economic impact of immigration involves a **cost-benefit analysis**. There is no definitive answer in principle. In practice, the economic benefits, which tend to be ignored in public debate, seem to outweigh the costs. What's more some of the perceived costs are completely spurious. The "lump of labour fallacy" is, as the name suggests, wrong.

If host countries gain from immigration, as I believe, does that imply that the countries which lose people suffer an economic loss? That sounds logical. After all, in the context of emigrants from developed countries we often worry about "brain drains". So it seems plausible to suppose developing countries are now losing out from the loss of economic migrants seeking to better themselves in America or Europe. Clearly if they are refugees too, there is nothing much at stake, but there are concerns about the potential economic cost to countries like India, the Philippines, Morocco, Mexico and so on if they are losing many ambitious workers in their prime, especially those with specific skills such as medicine or IT.

These economies will make some gains from their overseas workers. They will get remittances of earnings to the families back home. Some emigrants will return with valuable skills, experience and capital. Many invest in their home country even if they never return. Some engage in large-scale philanthropy such as setting up schools or university institutes back home.

The presence of groups of emigrants in another country will generally help to open up trade and investment and information links with the richer economy.

Again, the conclusion you reach about this is a matter of comparing costs and benefits. Looking at the example of the poor Mediterranean economies like Italy and Spain in the 1950s and 60s, it seems to me possible that the benefits outweigh the costs for the emigration countries too, but there is scant empirical research on this question. The preoccupation of western economists has so far been the assessment of the impact of immigration on their home economies, not emigration on foreign economies.

In the end the policy verdict has to depend on more than economics. Practical considerations involving numbers and the impact on a country's existing citizens will always be very important. But in a world in which freedom is highly valued, it cannot really be philosophically defensible for machines or dollars to be freer to move across national borders than for people. What kind of moral values would deny people any opportunity to make a better life for themselves and their descendants just because they have the misfortune to have been born somewhere in Sub-Saharan Africa instead of somewhere in the Mid-West? Call me a woolly liberal, but they are not my values. If freedom is good for me, good for investment bankers and oil companies, then it's good for everybody.

Chapter Nineteen

Demography: the south has the last laugh

Half the people who have ever lived in all of recorded human history are alive today. The world's current population of 6 billion is forecast to swell to 7 billion by 2015, and might not peak until it reaches a total of 8 billion. Population growth is a striking characteristic of modern times – until about 1750 it was scarcely above zero but peaked at 2% a year in 1970.

One of the earliest economists, Thomas Robert Malthus, published a famous essay in 1798 about population growth, *Essay on the principle of population as it affects the future improvement of society*. He argued that faster population growth, as observed in England during the preceding few decades, would outpace the capacity of the economy to feed all those new mouths. After all, there were **diminishing returns** in agriculture – every extra acre of land brought into cultivation would be steadily less productive because the best land was used first. The resulting famines and disease would cut the population back to the level that could be sustained.

As it turned out, Malthus published his famous essay just as his analysis stopped being true. It was a fair characterisation of the past but was overtaken by a new phenomenon, **technical progress**. New machinery and farming methods meant more and more corn per acre could be grown. Technical progress appeared in industry too, creating the non-agricultural wealth that meant demand for farm output per person grew too. In a virtuous circle of productivity increases and wealth creation, more and more people could be fed more and more food.

Ever since the mid-18th century, growth in population and growth in per capita economic output have been closely linked. When a country first embarks on the process of industrialisation and economic development, there is a very rapid increase in the rate of population growth. Typically, the birth rate stays high (as it always is in poor countries, so parents can insure against the high risk some of the children will die in infancy) but life expectancy rises and mortality rates for children and adults decline. Once per capita incomes reach a certain level, however, the birth rate drops sharply. Mothers will have two or three children rather than six or ten. This is such a regular pattern that it is known as the **demographic transition**.

Now, for the first time in history, some countries may be experiencing a new kind of demographic transition. The richest nations for the most part have birth rates below replacement level, and life expectancy is increasing more slowly than in the past. So their populations are both on the verge of shrinking and already ageing rapidly. The United States is an exception, mainly because of high immigration: it has immigrant groups with higher birthrates than the native-born population, and constant top-ups from new immigration. That small increase aside, all the growth in world population is taking place in the developing, not the developed, economies. By 2050 the rate of population growth in the developed world is likely to be minus 0.5% a year, compared to 0.5-1% a year in the developing world.

So it is that before another quarter century has passed, almost half the adults in Germany will be over 65. Along with Japan it has one of the world's lowest birthrates, just 1.3 children per woman on average. Italy and Spain are ageing almost as rapidly. Some of these are also amongst the countries which have been least open to immigration – only 1 % of the inhabitants of Japan are foreign born, 2 % in Italy.

No wonder that these ageing, rich countries have been at the forefront of concern about what is usually called the **demographic timebomb**. This refers to the prospect of a shrinking workforce supporting an expanding population of pensioners. The ratio of people aged 65 or over to people of working age is called the **dependency ratio** and it's going up throughout the developed world, including the US. In Japan the dependency ratio is likely to climb from 10% in 1950 and 20% now to over 50% (if nothing changes) by 2050. In the US, which has the smallest timebomb ticking away, the increase will be from 18% now to about 30% by 2050.

How worrying is this? Any economist will know that metaphorical timebombs never explode. The condition 'if nothing changes' is always wrong. Something will change because of the incentives set up by the current trends.

Many developments could alter future dependency ratios. People will start to retire later – indeed, already have in many countries, aided by improving health and vigour in old age. The ratio of the population that is employed will increase. For example, more and more women will work in those countries – Japan and much of Continental Europe – where female participation in the workforce is still low. Immigration is another way to boost the growth of the working-age population. (It's a marvellous demonstration of illogic, in the eyes of an economist, that many

people manage to worry simultaneously about the population time bomb posed by high immigration and the demographic time bomb created by ageing populations.)

Any of these, or a combination of all, would lead to declining, not increasing, dependency ratios. In Europe, for instance, only 60% of the working-age population actually works. If that were to rise to 75%, like the US, there would be a 10% decline in the dependency ratio rather than the 25% rise predicted with no change in the proportion in employment.

What's more, birth rates can change unexpectedly. Such shifts can alter the demographic landscape with a lag of just nine months. In the distant past birthrates have gone down during and after wars, but actually rose after 1945. This post-war baby boom was expected to generate an echo boom in the early 1960s but the birthrate fell sharply instead, probably because of social and cultural changes. The echo in fact came in the late 1980s and early 90s when women born in the 60s started having babies but much later in life than their own mothers. This wasn't just due to culture but also to advances in health technology. Who's to say our own children will not revert to starting early on larger families? The birth rate in the US, UK and France has crept up a little recently.

Still, scare stories are very compelling. Demographic change has widespread economic ramifications. It will alter the demand for all kinds of goods and services, especially housing, healthcare and education. It can affect economy-wide savings rates and therefore spill over into the stockmarket. It can boost suburbs at the expense of downtowns depending on whether there are many families with children.

However, the main concern about the rich nations' demographic time bomb has been how to pay for pensions, as – whatever the formal financial structure of pension arrangements – today's pensioners as a whole have to be supported out of today's economic resources produced by today's workers. For some years it was fashionable to argue that paying for pensions could be globalised: if pension funds invested in emerging markets in the rapidly-growing developing world, then the workers in those countries would be supporting us in our old age. However, successive global financial crises have taken the shine off this option. The more likely solution is that working patterns will change until the ratio of dependent pensioners to workers is put on a more sustainable track.

However, there may be deeper issues raised by the world's changing demographics. Population growth will always go hand in hand with economic growth but faster population growth is also often linked to faster growth in *GDP per person*, or faster growth in **productivity** in other words.

There are several possible theoretical explanations for this strong empirical link, none proven. Perhaps an expanding population creates incentives for technological advances to feed, clothe, house and meet all the other demands of the growing numbers of people. Perhaps **economies of scale** are so important in economic growth, as suggested by research into economic geography in recent years, that a rapid increase in the number of people in particular places can trigger a virtuous circle of development and growth.

Whatever the explanation, history offers no examples of countries that combine declining populations with economic vigour. Over a timescale of many decades, it is hard to believe that Japan and western Europe will remain amongst the world's economic leaders. After all, what kind of vote of confidence in the future is it that their populations are not replacing themselves? Some economists would dispute this, arguing that in future technical progress can substitute for population growth (rather than complementing it) in keeping GDP per head growing. I'm not convinced by them.

It seems to me more likely that either growing numbers of people will move from where they are being born to the already-rich economies (i.e. migration will increase substantially) or the centres of economic gravity will move to where the people are being born. All today's rich countries are close to much poorer countries with faster population growth – the US has Mexico on its border, Western Europe has Turkey and North Africa, Japan has South East Asia. If I had to bet on a particular outcome I'd predict the rich countries will absorb these dynamic neighbours as a matter of self-preservation. Indeed, this has already happened in western Europe with the EU admitting Greece, Spain and Portugal in the 1980s.

The deeper moral is that while fast-growing populations today seem a Malthusian burden to many poor countries, people, and not money, metals or oil, are nevertheless the key resource.

Chapter 20

Development: the triumph of fashion

Insoluble problems offend our sensibilities. We have grown so used to the idea that technology and human ingenuity can provide solutions. Researchers find cures for more and more diseases, governments build new roads, auto companies make cars with reduced emissions – there's a fix, eventually, for everything. In the rich western countries, most of us experience continuing improvements in health, longevity and the quality of life, with caveats, of course; but in general things get better.

So it's all the more frustrating to see some countries lagging further and further behind American or European or Korean or even Mexican living standards. Across much of sub-Saharan Africa, parts of south Asia and pockets of Latin America it seems life has not been getting any better at all. This isn't absolutely true: even in the poorest countries life expectancy has increased, although the HIV/Aids epidemic is starting to reverse that. But still, living standards measured by GDP per head are no higher now than in 1950 or even 1910 in the poorest countries.

Why is it that some countries just can't share in the solutions to the problems of poverty and disease that we know exist because we solved them in our own countries? Why is it impossible for so many countries to provide their citizens with clean water or electricity when there is no mystery about the technology and it's not even all that expensive? Why do some children continue dying for want of oral rehydration therapy when it is one of the cheapest, easiest to use and most important medical advances (in terms of life-saving potential) of recent times? Why was Afghanistan so dirt poor that a terrorist group managed to buy the government?

Sometimes the answer is in one sense pretty obvious: ethnic violence and civil war as in Afghanistan, Somalia or Rwanda are never going to help when it comes to building prosperous societies. You'd hardly bother to even plant a few vegetables in your garden if marauding soldiers are likely to drive you out of your home (at best), never mind build a business. Often in Africa inter-community violence is a legacy of colonial boundaries. There's no easy fix to this.

Unfortunately, any answers that go beyond these basics are not at all obvious. In fact one of the basic questions in economics is one of the least-well understood. Why do economies grow?

This explains why the field of development economics, the study of how to set poor countries on the track towards prosperity, is one of the areas of the subject most characterized by intellectual fashions. The prescriptions economists in the developed world have devised for the developing world have swung wildly over the decades, but the challenge of turning base material into gold, uncovering the mysterious alchemy of growth, has proven irresistible. After all, it now seems our own peace and prosperity depend very much on sharing the secret with the poorest countries.

As William Easterly, a leading development expert, has put it: “Observing the sufferings of the poor and the comforts of the rich motivated us on our quest. If our ambitious quest were successful, it would be one of humankind’s great intellectual triumphs.”

He and others do think they perhaps have now some genuine although limited insights into the process. This is progress, because in the past many development economists have been *certain* they knew the answer – and have been wrong each time. A greater degree of intellectual modesty is encouraging, therefore. It isn’t that past theories of development contained no insights – on the contrary. But each has been presented as a panacea, and that is what turns out to be false.

What’s more, it has embittered many people in poor countries, who have been promised that if only they do X or Y, even if it involves some sacrifices or political turmoil, then everything will be alright. Time after time, they follow one policy or another and then find the goal posts have been moved. This as much as the absence of economic growth explains the anger some very poor countries feel to western experts.

It’s worth running through some of the fashions in development economics to demonstrate the process. One of the earliest theories was that growth is related to investment in machines. Poor countries have low savings because they are poor, so if you work out how much capital investment they would need to hit a target growth rate, you can calculate their **financing gap**. Development experts did, for every country. Aid or loans from agencies like the World Bank or IMF, or from rich governments, were meant to help fill the gap. Much of the money granted or lent to poor countries over the years has been spent on huge capital projects like dams, roads, big factories, airports and the like.

Of course, growth must be related to investment in some sense. This is one of the basic, workhorse theories in economics. But it shouldn’t have been so hard to see it isn’t the whole

story. Machines need people to work them, people with certain types of skill and education. So eventually this realisation gave rise to another panacea, education, or investment in **human capital** as economists like to put it. There is a clear link between spending on educating the population and development – South Korea, one of relatively few countries to make the transition from developing to advanced, is the classic case study of the importance of education.

But again, human capital investment is an incomplete answer. This is why there's an array of other solutions to the development problem. Population control was once the height of fashion, based on the observation that poorer countries have higher birth rates than richer ones; but the causality is likely to run the other way, with rising incomes leading people to choose smaller families.

There was also a highly distinctive Marxist version of the economics of development, as of other aspects of economic theory. It was popular in developing countries because it pinned the blame for underdevelopment on imperialism, and the search by capitalism for new territory to exploit especially in terms of extracting raw materials. But Marxist economics lost its remaining appeal in 1989 with the collapse of communism. Linked to the Marxist analysis, but logically distinct from it, was the theory that under-developed economies were deliberately kept in a state of subservience or dependency by rich and powerful countries. This is still a popular theory in developing countries.

Today there are other ideas more in vogue. One hotly debated question is the extent to which its climate and geography determine the fate of a nation, for after all most poor countries are in the tropics. Another is the role played by cultural factors such as the absence of the Protestant work ethic or attitudes to gender. It is because we understand the process of growth so little that such debates can be so vigorous.

In terms of solutions to global poverty, there are at least two proposed cures in favour today. One is based on the all-too-true observation that in the past aid has been wasted because of corruption and bad government policies. So now, the argument goes, aid spending must be increased but conditional on good behaviour by the recipients. Apart from the fact that few developing country governments will welcome even more interference from the IMF and other donors in how they run their countries, for there's plenty of it already, there are reasons to be sceptical about how rigorously the conditions will ever be applied.

Because suppose for the sake of argument we do know what constitutes good policies, and can tell when they're being applied (which we don't fully). The poor countries that fail to deliver the good policies will be the ones with the worst-performing economies. They'll have slower growth, higher inflation, bigger government debts and so on. And they'll be exactly the ones supposed to be penalized by having aid reduced or withdrawn in future. It might make sense to be cruel to be kind, but **conditionality** will never be an easy strategy.

A second fashionable solution for poverty is **debt relief**, or writing off third world debt. Often because of bad governments in the past, dictators prone to building palaces and stashing money in secret bank accounts in the mountains of Europe, some very poor countries have built up debts they can never possibly repay. If creditors know they won't get all their money back, it makes sense for them to write off some of the debt, and enable the borrower countries to grow enough to pay back a bit in future. So some debt relief was sensible.

But writing off the whole lot as some campaigners wanted? Given the realities of how much tax revenue western voters will pay for the assistance of developing countries, this would inevitably divert aid from very poor countries without heavy debts – in other words, countries like Bangladesh that have been running pretty good economic policies with relatively little corruption over the years. This is not a good incentive structure. What's more, debt relief frees up funds for governments to spend on other things; it's supposed to be for health and education, but that runs into the same conditionality problems.

Unfortunately, the debt relief panacea has been tried before and failed. The examples of debt forgiveness since the 1970s suggest that most countries with high debts borrow to the hilt again as tranches of past debts are forgiven. Indebtedness is not a natural disaster like being hit by hurricanes or floods; it's a policy choice on the part of rotten governments.

So where have we got to? In order to embark on the path of economic growth, a poor country needs to invest in physical and human capital. It needs to stamp out violence and corruption. The government needs to operate good policies, whatever they may be, but certainly at a minimum provide a stable macroeconomic framework.

Economists seem to be continually discovering new requirements for a successful growth strategy, too. The Asian financial crisis of 1997-98 taught that banking systems and financial institutions are important – corruption and favouritism do damage in the private sector as well as in government. There is a strong emphasis now on the importance of social and political institutions generally in economic development. People will not invest for the future if there is little protection for private property or no way of formalising informal ownership, or if the police force and law courts are inefficient or corrupt. Often this is described as **social capital**, a new form of capital in which investment is needed. Amartya Sen, the Nobel-winning economist, has made it clear that we also need to understand development as an extension of human capacities and freedoms, not just as more money.

The emerging consensus is that economic development depends on a complicated kaleidoscope of policies and institutions. Co-ordinating everything – getting all the ducks in a line – is very difficult. But necessary, as growth seems a matter of breaking into a virtuous circle, out of a vicious spiral of poverty. For instance, people in poor countries have little incentive to invest in their own education because there are not enough other educated people for there to be industries that offer suitable employment. There's no point being an over-educated weaver of carpets or picker of tea. As in so many other areas of economics, the story is one of **increasing returns** where success reinforces success and tough luck to the losers. It ties in to the revitalized field of economic geography which uses increasing returns, and the bandwagon effect of markets thriving in some places and not others, to explain the unevenness of wealth and poverty within the developed economies. It isn't quite that geography is destiny, but bucking the forces of geography might well be as hard as overcoming history.

Still, the latest fashion – that there's no quick fix – is more encouraging I think than any of the previous ones. There's a much better chance of solving problems when you start out knowing how much you don't know as well as what you do.

PART V

The big picture: macroeconomics

Most of the chapters so far have not touched at all on what many readers will think of as economics, namely macroeconomics or how economies work at the aggregate level. This fills the newspapers and broadcast news day after day – whether the economy’s in recession, what the unemployment rate has gone up to, how much interest rates have come down, what are the government’s budget plans, and so on.

However macroeconomics has always been and remains the most controversial branch of the subject, because there is so much economists do not understand about how the individual decisions of millions of people combine. Still, although it is a field of competing theories and controversy, these chapters try to shed some light rather than heat on how to think about the big picture.

Chapter twenty-one

Japan: Kogaru versus one-kei, or why Tokyo's teenage fashions matter

Japanese teenagers might have come late to extreme fashions but by all accounts they are making up for lost time. Since James Dean invented the idea of the teenager in the rock and roll era, one fashion wave after another has swept over young people in America and much of Europe, with some particularly outstanding examples like punk in late-1970s London. But for much of that time Japanese teenagers seemed conformist and demure, much more intent on studying hard than rebellion.

No longer. The number and variety of teenage fashion tribes in Japan's cities is impressive. As I write this, one popular look is the cute *kogaru*, based on a character called Sailor Girl with teeny skirts, big wrinkled socks and clumpy shoes. The *one-kei* or 'big sisters' look, at the other extreme, is a pastiche ladylike style. These had taken over from *yamanba*, a witch-like style involving white hair and lipstick. The passion for fashion has helped keep Tokyo's shops bustling and prosperous. Indeed, Japanese consumers' more conventional fondness for ultra-pricey western designer goods has shown no signs of letting up at all despite an economic slump of more than 10 years.

What kind of slump is it that keeps some consumers shopping madly and Tokyo teenagers spending on a brand new look every few months? Sailor Girl offers some important clues, as we will see.

There is little doubt that Japan experienced an economic catastrophe. The level of GDP or national output in real terms in 2000 was about the same as it was in 1991. It didn't start to emerge from the stagnation until 2002. This added up to more than 12 years of stagnation for the world's second-biggest economy, which might have been expected to grow by at least 2% a year. Compounded over so many years, this implies the economy could have been over 25% bigger than it actually is today. As Japan is still despite its problems a \$4.1 trillion economy (in current yen converted to dollars at long-term 'purchasing power parity' exchange rates), a quarter of that is a vast amount of lost output. In fact, the lost potential is like losing an economy as big as Italy.

At the same time, unemployment in Japan has climbed to post-war records. Although these are low even by comparison with American standards, never mind European ones, the increase has been enough to mark the end of the Japanese worker's expectation that the first employment he chooses on graduation (a majority of Japanese women still stop work when they marry) would be a job for life. Nor is there much of a welfare system to cushion the blow of unemployment; it was never needed in the past.

In combination with zero real growth, prices have been flat or falling for years. The **deflation** means the economy measured in current prices is actually shrinking. There is no historical exception to the rule that an economy does not grow unless prices are rising a bit, so a recovery in Japan seems unlikely unless prices stop declining. A contraction in the current value of an economy is something we haven't seen anywhere since the 1930s. The degree of hardship in Japan today is nothing like as bad as the US in the Great Depression, thanks to the intervening half-century of gains in prosperity, but in macroeconomic terms the Japanese slump of the 1990s is just as exceptional.

It is only as the years have unfolded that economists have come to realize the severity of the situation. Many countries experienced a recession in the early 1990s after the boom of the late 1980s, and Japan was thought to be suffering the same kind of hangover as everybody else. Its boom had been spectacular. However, unlike the UK and US it did not start to recover from that recession. Only one or two years mid-decade saw any real-terms growth in the Japanese economy at all, and that very modest recovery turned out to be a false dawn.

What's more, it took a long time for economists to realize that conventional policies were not working. Everywhere apart from Japan there has been a remarkable consensus during the 1990s about how to run the national economy to achieve low and stable inflation and steady growth: a combination of a surplus, or not-too-big a deficit, of tax revenues over spending in the government budget with a central bank that sets interest rates above all to keep inflation low. While it hasn't exactly been smooth sailing everywhere, economists' agreement in theory about how the macroeconomy works and what the appropriate policies should be has been striking.

All the more striking as it followed a fierce intellectual battle in the 1980s between 'monetarist' and 'Keynesian' theories. In a nutshell, Keynesians, followers of the eminent British economist John Maynard Keynes, believed in the power of governments to manipulate the

economy over the course of the business cycle, by either monetary policy (raising and lowering interest rates) or fiscal policy (adjusting levels of tax and government spending). These tactics were described as **demand management** because they could boost or reduce demand in the aggregate.

Monetarists argued that even if these policies worked in the short-term they would make no difference to economic output in the long term, though, as that was determined by the economy's potential to produce goods and services – or the aggregate supply. All the government could achieve by trying to boost growth by raising demand would be higher prices.

The details of a debate that seemed all-important at the time are irrelevant now. All that matters is that on the question of whether the level of demand in the economy can be manipulated successfully in the short run there was, in effect, a monetarist victory. Such attempts, sometimes called **fine tuning**, simply affect people's expectations and behaviour in ways that counteract the original policies. Monetarism enthused some governments so much they made terrible mistakes putting it into practice. (For example, Mrs Thatcher plunged Britain into a recession that wiped out a fifth of the country's manufacturing industry by following slavishly fixed targets for particular measures of monetary expansion. Her simultaneous deregulation of bank lending rules made the measures and their growth rates a terrible guide to how tight or loose the policy was. It turned out to be strangulation-tight.) After such early experiments, though, a gentler version of monetarism has delivered much better economic outcomes in the 1990s than in the previous two and a half decades.

Except in Japan, that is. And that single failure inevitably raises a question mark over how well-founded the current macroeconomic consensus can be. If the standard policy measures do not work there, is that because of something unique to do with Japan, perhaps a question of culture or attitudes, or is it because the policies only work in certain types of circumstances? And if the latter, does that mean we should not be so complacent about the consensus economic policies outside Japan? There were fears in 2001 that the US 'dot bomb' recession then could turn into a decade-long stagnation too. That didn't happen, but the fear has re-arisen after the credit crisis and housing market slump which started in the summer of 2007.

According to Keynes, the most important influence of all on the state of the economy is what he called 'animal spirits', the general degree of optimism about the future, determined by

psychological or political factors rather than economic ones. Economists cannot offer a policy to improve a country's animal spirits. When it became apparent that Japan was not recovering from recession, there were two standard policy levers that could be used to stimulate the economy, according to the conventional approach. If total demand in the economy is persistently falling short of productive capacity in a business cycle downturn, you can try, first, looser monetary policy, or secondly, looser fiscal policy.

A permanent monetary expansion in the long-run only increases prices, not output, but in the short-run (which might be years) a temporary monetary expansion can boost demand and growth by encouraging more consumer spending and business investment. In practice, looser monetary policy is implemented by cutting interest rates. Central banks usually achieve interest rate reductions through their interventions in the money markets, where the interest rate is the price of the central bank's transactions with commercial banks.

Japanese interest rates had been fairly close to zero since the end of 1995, however. In March 2001 the Bank of Japan cut its main interest rate to zero after a controversial increase to 0.25% the previous August. In performing this U-turn it promised to provide as much money in the money markets as it would take to keep the rate at zero.

However, on several days in the summer of 2001, in an unprecedented money market situation, Japanese banks decided they didn't want any money even at a zero price. They couldn't think of anything they wanted to do with free money. The artist Akasegawa Genpei mocked the power of money by printing 'fake' zero yen notes in 1967. He invited the general public to send him real yen notes in exchange, with the aim of putting the state currency out of circulation. Reality caught up with art in a most unexpected way 34 years later.

Economic theory does encompass a situation where monetary policy becomes useless because you can't push interest rates any lower than zero. It is the **liquidity trap** first noted by Keynes and his follower John Hicks in the context of the 1920s and 1930s depression. In this trap, the real interest rate (i.e. the nominal rate less the expected rate of inflation) needed to raise investment in the economy up to the prevailing level of savings would be negative. Unfortunately a negative real interest rate is not possible unless there is inflation in excess of the nominal interest rate (for example, interest rates at 2% and inflation at 3%, for a real interest rate of minus 1%). If there is *deflation* instead, so there is a *positive* real interest rate when the nominal interest

rate is zero, it is not possible at all. (Zero interest rates and prices falling at 2% a year makes for a real interest rate of plus 2%.)

Why? If prices are going to be lower next year, it still makes sense for consumers to save even if they get no interest because they can buy more with their cash next year. Yet there is a real cost to businesses if they borrow even at zero interest to invest because they will have to pay back next year an amount that would buy them more equipment than they can get for the money this year. Something else is going to have to stop prices falling if consumers carry on saving too much and businesses postpone investment.

Keynes's way out of the trap was fiscal policy. If monetary policy cannot work, then the government should be able to stimulate the economy by deficit spending. Leave taxes unchanged, or cut them to encourage consumer spending and private investment. Increase government expenditure on projects like building bridges or schools. This will boost demand and jolt the economy out of the liquidity trap. Keynes famously argued that even 'wasteful' spending like paying people to dig holes and fill them in again would help by creating demand in the economy because the workers on such public schemes would spend their wages. This philosophy inspired Franklin D Roosevelt's New Deal and seemed to work. The American economy had begun to emerge from its long slump when the second world war gave an even bigger and better boost to demand.

The current economic orthodoxy, though, is that government deficits should not be too big. There are several reasons, corresponding to different archaeological layers of economic thought. First there is the straightforward argument that if the government wants to borrow more from the national savings pool it will bid up interest rates for private borrowers, so government spending will **crowd out** some private investment. This is less important if the government is borrowing relatively small amounts from the vast international savings pool.

Secondly, if the government borrows so much it drives the long-term interest rate higher than the economy's long-term growth rate, it could put its debt level on an explosive path. The economy will in some circumstances never grow fast enough to generate the revenues to pay the debt interest. This is a genuine, not a theoretical, worry. The governments of several countries have so much debt that their entire budget deficit consists of interest payments.

The most recent kind of argument against too much debt points out that taxpayers are not dumb. Sometimes this is described as **rational expectations**, which is the idea that what people expect about the future conforms to reality, at least in the sense that it is not possible to fool them systematically and permanently. Taxpayers will therefore realize – to a debatable extent – that government borrowing now means higher taxes in future. So they adjust their spending downwards now to compensate. In the extreme special case, higher deficit-financed government spending now is completely offset by reduced private spending as taxpayers earmark current income for future taxes.

Despite these arguments, economists accept that the government budget can help stimulate demand, so Japan has tried it. And tried again and again. Its government budget deficit has been as high as 3-4 % of GDP throughout the late 1990s. Running such big deficits year after year has boosted the ratio of outstanding government debt to GDP from 60% at the beginning of the 1990s to 170% by 2006. Yet the fiscal expansion probably explains why there has been a little growth in some years, and no doubt kept national output higher than it would otherwise have been.

However, even such a huge fiscal boost has not proven big enough to jump-start the economy. And now the accumulated debts have reached such an alarming level that there are serious concerns about continuing government deficits. Japanese taxpayers have certainly got to the point where they understand that future taxes will be higher and, crucially, that the government might not be able to pay their future pensions. So further government borrowing now is being offset by increased private saving. On a chart, government ‘dissaving’ or borrowing is almost the mirror image of private saving. (The same is true the other way round, incidentally, in the US, where big government surpluses in the 1990s were been mirrored by big private deficits.) Some economists now think Japan ought to put its fiscal policy into reverse in order to encourage taxpayers to save a little less. Others fear tighter fiscal policy would exacerbate the continuing slump and must be postponed.

If monetary policy doesn’t work and nor does fiscal policy, what does that leave? Well maybe Japan’s problems lie in microeconomics, rather than macroeconomic policies. In recent years, economists have turned their attention away from policies aimed at manipulating demand in the Japanese economy to so-called ‘structural’ policies.

These include measures like reform of the banking system to make it easier for businesses to borrow or to encourage a venture capital industry; labour market reforms that will make it easier for businesses to destroy old jobs but create new ones and will encourage workers to move more freely between jobs; abandoning the tradition of co-operative corporate networks (*keiretsu*) in favour of vibrant competition. In short, the prescription is for the Japanese economy to become more like the American economy of the 1990s. What worked for Japan in an earlier era, its big government-directed and bureaucratic corporations, is inappropriate for a time when technical change demands adaptability and risk taking, the argument goes.

This is probably correct. Many Japanese policy-makers and economists accept that the economic system needs to change. Banking reform in particular is widely seen as essential. Several banks went bankrupt in the 1990s because they had lent so much money to companies with which they had a traditional *keiretsu* relationship without applying basic commercial criteria to the loans - were they being used to finance productive investments? Would they be repaid? The bad debt overhang is still immense and is preventing banks from lending to new customers. At the same time, consumer credit is vastly underdeveloped by the standards of the US or Europe. Even credit cards are rare in Japan. Despite a decade of financial reform, in the autumn of 2007 the IMF was still calling on the Japanese government to strengthen the banks still further.

So advocating structural reform is perfectly good advice. But although it will certainly increase the Japanese economy's long-term potential, the real problem is that demand is falling short of its existing potential. Structural reform might well only exacerbate the gap between demand and supply. The country might well have microeconomic problems, but it has macroeconomic ones too.

Any measure to jolt the economy out of its current stagnation will have to get consumers and businesses spending more and will have to stop prices falling. This reasoning prompted Paul Krugman, a Princeton University economist, to publish in 1998 a hugely influential article revisiting the Keynesian idea of the liquidity trap.

There are good reasons for thinking Japan is in a liquidity trap, apart from the obvious ones of falling prices and ineffective zero interest rates. The trap, remember, is the problem of "too much" saving and "not enough" investment (or too much supply and not enough demand in the economy as a whole) despite very low interest rates. In the past Japan has been a high saving,

high investment economy. It is plausible to suggest there might have been too much investment during Japan's boom years in the late 1980s, leading to over-capacity in some industries when growth slowed. This is a classic business cycle pattern, possibly taken to excess in Japan's case. Some economists believed the same happened in the United States in the late 1990s and were correspondingly gloomy about its economic prospects for the next few years (they were wrong that time).

More fundamentally, there are good reasons to believe Japan's long-term potential growth rate is now much lower than it was in the 1970s and 1980s. The main reason is the ageing population. Tokyo's teenagers might be spending freely on platform shoes, mobile phones, Louis Vuitton handbags and hair-dye, but there are not enough of them. Instead, the ranks of the late-middle aged are building up and the elderly conserving their savings, fearful about how they can finance a retirement that might turn out to be longer than anything in past human experience. Throughout the rich world this ageing is occurring due to a mix of longer life expectancy and lower birth rates. But it is at its most extreme in Japan where the birth rate is far below replacement levels and there is next to no immigration. There are going to be fewer Japanese people and their average age is rising. It is easy to see why expectations of lower growth in future because of the demographic trends might lead people to save more than enough to satisfy the economy's need for savings to finance investment now. Perhaps the government should offer a special bonus payment to immigrants who are under 25 and will spend a lot.

Krugman went on to recommend that the Bank of Japan should bring about a reduction in savings by making the real interest rate negative. That involves guaranteeing there will be inflation. His suggestion was a permanent inflation target of, say, 4%, compared with a current inflation rate of about minus 1%. That involves not just monetary expansion now but a promise of monetary expansion permanently into the future. For, in the end, a permanent monetary loosening will raise prices.

The trick is not only ensuring the permanence of the policy but also making sure everybody believes it to be permanent. Other creative suggestions for making monetary policy work again have included a proposal to time-stamp currency so that it would be worthless if not spent before a certain date. That amounts to an enforced rapid inflation - in a normal inflation it takes a currency a very long time to become completely worthless. So maybe this time-limited coupon idea is too extreme. Inflation targetting has worked very well in other circumstances as a

means of setting monetary policy and there is no reason to think it a bad idea in Japan's case just because it is suffering from too low rather than too high an inflation rate at present.

Eventually, the Japanese economy will have adjusted down to the prevailing level of demand so that prices do not need to fall any further, and when prices stop falling a zero nominal interest rate corresponds to a zero real rate and might start stimulating the economy in the conventional way. But that seems a pessimistic outlook for a country that in the 1980s was seen as one of the most dynamic and powerful in the world. Is there an optimistic scenario?

If Krugman is right about the reason Japan has fallen into a liquidity trap, its consumers are saving too much (except for the dwindling number of fashion-conscious Japanese teenagers in an ageing population) and companies investing too little because they believe the country's growth potential is lower in the future than in the past. However, the United States has almost certainly seen an increase in its potential growth rate during the 1990s (despite the downturn since) because of the implementation of new technologies, and perhaps also because of sheer 'animal spirits'. If the Japanese started to see this kind of 'New Economy' experience in their own future, pointing to favourable long-run growth prospects, the real interest rate that would bring saving and investment into balance would rise and the liquidity trap would fade away. To the extent that structural reforms would improve the economy's potential in the long-term future - and get people believing in it - this argument puts the spotlight back on the supply side of the economy.

Japan's unusually adverse demographic trends might outweigh the favourable effects of technological advances, or they might not. And it is not the only country ageing so fast. Some European countries like Italy have very low birth rates and rising average ages too, along with conditions far less favourable to productivity improvements, lacking, for example, Japan's impressive science base and leading high-technology multinationals. On the other hand, Italy has a lot of immigration and a very different financial and industrial structure. The exact links between developments fundamental to long-term growth, such as demographic and technical change, and actual long-term growth form just about the least well-understood area in all of economics.

The other point about this discussion is that it reminds us that thinking about demand and supply in an economy as a whole, as opposed to the market for apples or pins, is a bit of an intellectual convenience for economists. The idea of a price level for a 'unit' of national output is

highly abstract. The extent of this abstraction is actually revealed by the language of macroeconomics. It is much easier to write about individual industries or individuals' economic decisions without using any jargon, but it has been impossible to avoid all jargon in writing about macroeconomics. Any non-specialist will start to glaze over a sentence that has 'negative real interest rates' or 'productive potential' or 'liquidity trap' in it.

While we economists tend to fall into the habit of thinking about demand and supply and price at the aggregate level of the whole economy as being analogous to a market for a single good, this can be misleading. In particular, it is possible that for the economy as a whole, many levels of output and prices could prevail in a given set of objective circumstances, depending on what people expect to happen in future or how confident they feel. It sounds a bit woolly, but it is this indeterminacy that makes macroeconomics so interesting and, in the end, always controversial.

The pragmatic agreement about how to run macroeconomic policies that I described earlier has come about because for most of the rich OECD countries the 1990s went rather well. It is real-life problems that generate controversy and change in economic theory. That earlier debate between monetarists and Keynesians was the fruit of **stagflation**, the 1970s experience of high and rising inflation combined with recession or stagnation.

Japan's experience in the past decade has looked like a return to the problems of the 1930s, especially the liquidity trap, which gave rise to the Keynesian prescriptions in the first place. Same problems, same policies? Unfortunately, that simple equation has not worked. And there is no professional consensus that Professor Krugman's updating of the policies would work. One of the lessons of this discussion is how little we still know about what makes economies as a whole perform well or badly.

Chapter Twenty-two

Inflation: targeting the sleeping beast

It is a long time since **inflation** was a serious problem for central banks and governments in countries like the United States, Japan and the big European countries. Throughout the 1990s, and despite a record-breaking boom in the US and UK, inflation – the rate of increase in the general price level – remained very low.

It wasn't always so, and still isn't true everywhere. In the leading economies the inflation rate climbed to near 10% in the last years of the 80s, while the 1970s and early 80s were marked by inflation rates of up to 25%.

In many other countries, ranging from Greece and Turkey to Brazil and Argentina, the Philippines and Thailand, the experience over the years has been far worse. Many suffered **hyperinflation**, with price levels climbing at annual rates in the hundreds or thousands of percent. Zimbabwe has been in that state in 2007, with an inflation rate of 7000% and climbing as I write. But hyperinflation was more common in the 70s. In the statistical publications of the International Monetary Fund dating from that decade, the charts down the side of each page of figures illustrating inflation showed lines that rose steeply on the graph, and then continued off the graph and over the rest of the page.

The worldwide acceleration in inflation dating from just before 1970, and exacerbated by the oil price shocks of that decade, was unexpected and alarming. For most of the post-war era policy-makers had been firmly focussed on ensuring their economies grew fast enough to keep unemployment low.

The people running governments and central banks remembered all too clearly the pre-war depression and the political tensions stirred up by high unemployment. The economic failure paved the way for the political and diplomatic catastrophes that led ultimately to tens of millions of lives lost in the second world war. John Maynard Keynes and other leading economists, who had spent a decade trying to figure out the causes and solutions to depression and unemployment, developed the tools of **demand management** which would allow them to **fine-tune** the level of output and employment.

For example, cutting taxes and raising government spending – levers of **fiscal policy** – would both put more money in the pockets of consumers and businesses, which would spend more, expanding the economy's level of aggregate demand. Reducing interest rates or increasing the amount of money circulating around the economy through central banking techniques such as buying up some government bonds – **monetary policy** – would have the same effect. Of course given the economy's **aggregate supply**, expanding demand would lead to higher prices and probably a higher rate of inflation, too. But for many years there was believed to be a trade-off between output (or employment, or with the opposite sign, unemployment) and inflation. The relationship linking unemployment and inflation even had a name, the **Phillips Curve**, a downward sloping line showing high inflation at very low unemployment levels and low inflation at high unemployment levels. Policymakers could choose where they wanted to be and adjust fiscal and monetary policy to get there.

Practice never quite works out like theory. The relationship turned out not to be stable and could only be exploited in this way in the short term. For suppose the government stimulated growth and cut unemployment at the price of a higher inflation rate. Before long people adjust to the new inflation rate and make higher pay claims, or expect higher interest on their bank deposits or increase the prices they are charging a bit faster. Nothing has really changed once people's expectations of inflation adjust, except for the fact that the actual inflation rate is higher than it was. The Phillips curve ignored the fact that expectations could change. (It was too mechanistic – in fact, the Phillips after whom it is named was an engineer who had literally built a machine to represent the economy. A few examples still sit in museums.) Over time, the trade-off became less and less favourable in the sense that to achieve a level of unemployment below a particular number cost more and more in terms of higher inflation. That particular number is called the **non-accelerating inflation rate of unemployment** or **Nairu**, and varies between countries and itself shifts over time for reasons to do with the underlying structure of the economy.

This potted history of post-war macroeconomic policy takes only a few paragraphs, but was of course played out over several decades and causing much economic pain along the way. Many countries ended up with high inflation and high unemployment, a politically corrosive mix given the unlovely name of **stagflation**.

It is easy to think that it's unemployment that really matters. After all, depriving people of the opportunity to work undermines their ability to provide for themselves and their families, and also their dignity.

However, voters punish governments that land them with high inflation most harshly. High inflation makes planning for the future harder because nobody is sure how much less their money will be worth in three or ten years' time. It redistributes money from savers to borrowers because it reduces the real purchasing power of savings and reduces the real burden of debts. It penalizes people on low incomes, or fixed incomes like pensions, because the low-paid never manage to keep their earnings rising in line with inflation. Their ability to purchase goods and services is steadily eroded as prices go up and their incomes don't match the increase. I still clearly remember the anxiety in my not-too-well-off family during the 1970s about what we would be able to afford with prices going up so fast, and my mother hoarding coffee and sugar because they would be so much dearer later.

Mervyn King, deputy governor of the Bank of England, labelled the cohort of UK citizens born in the mid-1960s the 'inflation generation'. For them inflation had been the norm and affected every decision they made, from career choice (was the pension indexed?) to buying a house (it was worth taking on a big mortgage because inflation would erode its value). The purchasing power of a £100 cash gift at their birth had shrunk to £1 by their 30th birthday.

Altogether since 1945 the level of prices in the UK had risen twenty-fold by 1995. Before modern times inflation was virtually unknown (apart from one or two exceptional episodes). But if you imagine the UK's price level to be represented by the depth of the River Thames, which was 8 feet in 1800, it varied mostly between 5 and 7 feet until 1914, and between 6 and 13 feet until 1945 (not a stable era in the world economy). But since 1945 the water level has risen to over 200 feet.

After this experience, a serious failure of macroeconomic policy, it would be foolish to think there will never be any danger of inflation again. Inflation matters, especially if it's long-lasting. A prolonged bout of inflation undermines investment, distorts people's decisions and over time reduces the economy's potential supply.

Still, there isn't much inflation to speak of across large swathes of the world economy. If anything, there has been more concern about **deflation**, that is negative inflation or a falling price level. It is hard to achieve any real growth, actual increases in output, when the economy is shrinking in money terms because of widespread falls in prices. A little bit of inflation seems an essential lubricant for growth.

Nevertheless, it's worth pondering whether policymakers have a better handle on managing inflation – relying on there being no change in circumstances, or luck, does not seem a good policy. And the answer is yes, probably. It's what seems to have worked for the past decade, in admittedly favourable conditions. That is **inflation targeting**.

The UK was one of the pioneers of inflation targeting, which means setting an explicit target level of inflation without specifying exactly how it is to be achieved. Since the framework was introduced in 1993 the inflation rate has been low and stable, and there has not been a quarter of negative economic growth since. (The US Federal Reserve does not have a specific target but in practice acts much as if it did, and Fed Chairman Ben Bernanke is a fan of inflation targeting.)

Here's how it works. The government sets the Bank of England a target, currently 2.0%, for its chosen measure of inflation a range in which it is acceptable for it to vary – at present that's 1-3%. The Bank is responsible for how it decides to hit the target, setting the level of interest rates month by month at regular meetings. Details vary in other central banks. Some choose targets that are not symmetric – they aim for inflation below a certain level rather than between certain levels. Targets can also apply over various time horizons.

Public accountability is an important part of the process. The minutes of the meetings are published after two weeks to explain the reasoning behind the decision, and the members of the interest rate setting committee (five Bank of England officials, four outside experts appointed by the government) give speeches, and appear before Parliamentary committees to explain themselves. This is more than a matter of democracy, of bringing unelected central bankers to account. For **credibility** is a useful anti-inflation weapon in itself. If everybody believes inflation will stay around 2.5% they will behave accordingly, by not making 10% wage claims for instance, and thus help fulfil the target. Expectations worked against the successful use of the Phillips Curve but are helpful to the inflation targeting approach.

Targeting seems better than previous policies for several reasons. In the past economists thought monetary policy was a matter of choosing between allowing the government or central bank complete **discretion**, which turned out not to be anti-inflationary at all as we saw, and setting fixed **rules**.

The kind of rule tried widely in the late 1970s, as countries struggled to tame high inflation, was setting a **monetary target**, a fixed rate of growth for the money supply. This is not the place to go into definitions of money supply and all the other technicalities; the idea was just that inflation couldn't go beyond a certain rate if there wasn't enough money swimming around the economy.

Monetary targeting worked well in one sense. It did bring inflation down. However, there was in many countries an appalling cost – it worked by causing a deep and long recession. What's more, it became impossible to apply the rule because the deregulation of credit markets in many countries in the early 1980s made it impossible to find a measure of the money supply that continued to have a steady and meaningful link to economic activity.

There are other types of rule, however. One adopted in many developing and middle-income economies has been an **exchange rate target**. If you keep your currency in a constant relationship to the US dollar, you can't have a higher inflation rate than the United States. In other words, monetary policy gets exported to a central bank that is better at it, namely the Federal Reserve. This too worked well for a while for many countries.

Argentina, for instance, had a very rigid link between its peso and the dollar which did tame excessive inflation. Unfortunately sustaining the link imposed a growing cost on the economy in terms of recession, while the government over-borrowed to try and compensate by spending a lot more than it raised in taxes. In particular, provincial governments increased their spending by far more than the central government was able to raise in additional taxes. By late 2001, the country was in a catastrophic economic crisis. It mirrored many earlier currency crises in emerging markets, when it becomes clear to the financial markets that the exchange rate rule cannot be sustained so they speculate heavily against the currency. It was no surprise to any economist that Argentina had to abandon the dollar link, devalue the peso, and default on the debt it had built up meanwhile. The crisis was an economic tragedy for the country and its people, and

one that could have been avoided if the government had not over half a decade run a fiscal policy inconsistent with the tough monetary rule.

In short, monetary rules work well in some circumstances and not others. They do not work well if other policies undermine them. Not surprisingly, the ideal is to combine rules, which give people confidence monetary policy will keep inflation low, with discretion, so policy can be adapted when circumstances change.

Fans of inflation targets say they provide precisely this kind of constrained discretion. The framework is crystal clear: the authorities will do what it takes to keep inflation on track. But there remains enough flexibility to respond to changing circumstances.

So far the inflation targetting framework has not been tested by the kind of global economic shocks that sent inflation soaring in the 1970s. Nor is it the only option. The US Federal Reserve is one of the world's best monetary authorities and it doesn't have an explicit inflation target. It does, however, behave as if it has one. There are stable links between the economy's behaviour and the way the Fed changes interest rates – growth above the normal trend leads to an increase in rates and vice versa. This kind of predictable policy reaction is known as a 'Taylor Rule' after the economist (John Taylor) who identified it.

There are some other promising experiments around the world. For instance, Turkey was launching a new inflation target, under the auspices of an IMF program to sort out its economic woes. It started with inflation around 60%, which soon fell to 5-10%. A number of countries along with the UK, including Canada, New Zealand, Sweden, Finland, Israel, Sweden, Spain and Australia, have adopted one form or another of inflation targetting.

Still, anybody aware of the changes in economists' and policymakers' consensus over the decades about how to keep inflation tamed will recognise that even the best policy frameworks don't last for ever. Times change, and as Keynes apocryphally pointed out, it then makes sense to change your mind.

Chapter Twenty-three

Defence Spending: A farewell to the peace dividend

“My budget includes the largest increase in defence spending in two decades, because while the price of freedom and security is high, it is never too high.” So said US President George W Bush in his State of the Union address in January 2002. The rise announced in the budget a few weeks later was \$48 billion. No surprise, really, in the wake of the 11 September attacks just five months earlier and the subsequent wars in Afghanistan and then Iraq.

For a number of years American military top brass had been arguing that increased defence spending was essential, and coincidentally enough the figure they had in mind was an extra \$50 billion a year. In a series of reviews in the late 1990s the army, navy, airforce and marines had spelt out the ways they thought post-Cold War cuts in spending had undermined the defence capabilities of the US.

America’s defence spending peaked at \$304 billion in 1989, as the Berlin Wall fell and the communist regimes of Eastern Europe crumbled. In 1999 the figure had dropped to \$283 billion. This was a dramatic fall – from the equivalent of 6.5% of US GDP to 3.2%. In the months right after the west’s victory in the Cold War, the realisation that government spending on national defence could decline was labelled the **peace dividend**.

How important, then, was the outbreak of peace, and how much will it matter for the economy if the eruption of a new war, the war on terrorism, spells a rising defence burden in future? A saving in government spending amounting to 3% of GDP for a decade is a large sum of money – more than \$250 billion in 1999 alone, and perhaps as much as \$2 trillion in ten years. The exact figure depends on whether you assume the defence budget would have stayed at its 1989 level, or risen, or been cut back, if the course of history had run differently. But in 1990, then-President George Bush had a \$350 billion defence budget pencilled in for 1994, whereas his successor actually spent \$250 billion, a \$100 billion gap. So a couple of trillion seems in the right ballpark.

Whatever precise number you opt for, it is a large amount released for either other government spending programs or deficit reduction. The state of the federal government's finances shifted from large deficit to large surplus over the course of the 1990s, in an extraordinary turnaround that would not have been possible without the defence cuts. The only other ways to start narrowing the chasm between government spending and tax revenues at the start of the decade would have been either increased taxes or cuts in other programs, both ultra-painful politically.

One important consequence of this substantial decline in government borrowing, a deficit of \$290 billion in 1992 transformed into a 2000 surplus of \$236 billion, was a fall in long-term interest rates set in the US Treasury bond market, particularly in the later 1990s when investors woke up to the fact that the government was actually retiring some of its outstanding debt. For borrowing by the government **crowds out** borrowing by the private sector, by competing for funds provided by investors. This may sound esoteric, but it had important ramifications because other interest rates depend on long-term government bond yields. For example, it became much cheaper for homebuyers with lower mortgages rates or companies planning to borrow money for investment as federal surpluses grew during the 1990s. While economic textbooks have long pointed out the existence of crowding out, budget deficits had been around for so long by the end of the Cold War that nobody could really remember what it was like when there had last been a lot less competition for funds in the capital markets from the government.

Alan Greenspan, then Federal Reserve Chairman, was convinced crowding out was an important phenomenon. He believed that if the peace dividend could be directed towards deficit reduction rather than spending on other programs then investors would seek out other opportunities, and put their money towards productive uses, which would have a big payoff for the economy. When Bill Clinton won the Presidency for the Democrats in 1992, Mr Greenspan struck a deal with the new president. He promised lower interest rates in return for reduced deficits. Mr Clinton redirected the savings on the defence budget into a combination of increased spending on (mainly) Medicare and Social Security and a decreased federal budget deficit. Defence's share of total government spending dropped from 28% at the end of the 1980s to 16% in 1999.

Many traditional Democrats were nevertheless sceptical, and angry that they would not be able to increase spending on social programs as much as they had hoped – and all because a

Republican at the Fed claimed the financial markets were all-important. How come the financial markets were more important than a democratically elected Administration? James Carville, the director of the Clinton campaign, famously said: "I used to think if there was reincarnation, I wanted to come back as the President or the Pope or a .400 baseball hitter. But now I want to come back as the bond market. You can intimidate everyone."

Others had a different concern about the shrinking defence budget. The government had been an important source of funds for research and development of new technologies through military and space programs – most famously the Internet itself. Civilian R&D spending in the US has long been much lower than in other industrial countries such as Germany and Japan – 1.9% of GDP versus 2.5-3%. The fear was that non-military companies would not make up for reduced military research and innovation (although economist William Baumol argues that America's military strength is based on the country's civilian technical expertise and economic vibrancy, not the other way round). Civilian R&D didn't, in fact, make up for the drop in defence R&D. It's impossible to be sure at this point whether this is going to have made a big difference to the long-term competitive strength of the US economy, because the whole process of innovation is so long and uncertain – and, frankly, still so little understood by economists. There seems little reason for its citizens to fret, though, about America's economic strength and dynamism compared to other countries. It remains the world's undisputed technological leader in all but a few areas.

That one hypothetical concern aside, events favoured the Greenspan view. Throughout the second half of the decade interest rates in the US stayed low, investment in new businesses and technologies boomed, and the economy experienced its longest expansion since records began with a significant increase in the productivity trend. The good times came to an end, of course, but it's not too fanciful to see the New Economy investment boom as a part of the peace dividend.

It wasn't only the United States that enjoyed a peace dividend, however. Worldwide military spending fell from 3.6% of global GDP in 1990 to 2.4% in 1999, although the decline was concentrated in the industrialized and post-communist countries. Developing countries in general hardly cut their military spending at all, relative to the size of their economies, and some increased it. The worldwide peace dividend for 1999 may have been as much as \$350-400 billion. That's the equivalent of an economy the size of the Netherlands. The International Monetary

Fund reckons those poorer countries that did opt for a peace dividend were able to both increase spending on vital social programs like health and education and cut government deficits too.

Throughout the rich world, too, other nations apart from the US discovered the joy of deficit reduction thanks to a reduced defence burden. Britain's new Labour Chancellor of the Exchequer (or finance minister in plain English, took a leaf straight out of the Clinton book, and opted to cut government borrowing before increasing spending on public services as so many Labour supporters would have liked. Gordon Brown was mocked for his obsession with 'prudence' – yet the achievement, briefly, of a surplus of revenue over expenditure meant he too could pay off some of the government's debt and save on interest payments. Just as in the US, long-term interest rates in Britain fell to their lowest levels, in real terms, for many years.

Governments are always free to choose the level of spending and taxes, and the gap between the two. The state of the business cycle will make a difference because a recession will always lower tax revenues and lead to automatic rises in areas of spending like unemployment benefits – these types of adjustment are known as **automatic stabilizers** because they limit the impact of a slowdown in the private sector and occur without the government needing to make any decisions. But in the end it's a matter of politics, not mechanical choices. The point about the peace dividend is that it made the choices much, much easier because it was so obvious where spending cuts could fall. The military were, for a while, politically defenceless.

The peace dividend, then, has been large and significant. This should come as no surprise. War is not an inherently productive activity, to say the least. This points to a rather pessimistic conclusion about the likely impact of the resumption of war, and one that could, like the Cold War, be long drawn-out and spread its tentacles throughout civilian life. After all, uncertainty about the world outlook is likely to keep investment spending lower than it might otherwise have been, as businesses opt for taking fewer risky bets on demand for their products or services. The new concern, not only in America but worldwide, about security, and higher insurance premiums, will raise businesses' costs. Even a small increase in costs can have a big impact on investment decisions and on international trade. Some specific industries have been badly affected by the terror attacks, like airlines and tourism. And there may be other ramifications, like a drop in immigration to the United States, reversing a flow of skills and energy that had enormously benefited the economy during the 1990s.

Being a Republican, President George W Bush has been a cutter of taxes for the well-off in America. He has also, of course, continued to increase defence spending because of Iraq. In 2002, Yale economist William Nordhaus predicted that Iraq would cost the United States \$1.6 trillion by 2012. The administration dismissed the estimate but by 2007 the non-partisan Congressional Budget Office was putting the cost at between \$1 and \$2 trillion, depending on how much longer the US occupation lasted. \$1 trillion over ten years would be less than 1% of US GDP, so less proportionately than the Vietnam war. But not an insignificant amount of money.

The other question that raises itself in the minds of non-Americans, even the closest of allies, is whether the US really needs to splash out \$350 billion a year on defence. Defence orders help some businesses in the American economy. The military need is another matter. Before the Bush boost, the country spent as much on defence as the next nine biggest military spenders put together. Afterwards, although the rise was initially equivalent to just 0.1% of GDP, America's spending exceeds that of the next fifteen biggest countries, at current exchange rates. The \$48 billion annual increase in 2002 alone was twice Italy's entire defence budget for the year. Is this perhaps taking super-powerdom to extremes?

Is it really going to take a lot more money to maintain the same military and diplomatic superiority over other nations – all other nations? It's hard to believe any other country, even China, could catch up on this overwhelming lead. Perhaps in a generation or two, if the Chinese economy lives up to expectations, but the People's Army has a lot of technological catching-up to do. As for the old Cold War enemy, Russia, it is now a small economy, albeit one with nuclear weapons, and has better things to do with its tax revenues than try to reclaim superpower status.

Indeed, is throwing a lot of money at the problem, buying even more aircraft carriers and warheads to add to the huge and overwhelming array of force already at the disposal of the US military, the route to victory in the war against terrorism? The generals and admirals certainly think so – but they would say that, wouldn't they?

Chapter Twenty-four

Weather: why economists care about the sex life of pigs

The British weather is a subject of endless fascination to the British people. Either it's terrible (most of the time and therefore deserving of complaint) or it's not (so unusual it's worth commenting on). As I write today we are enjoying one of the warmest June days in recent memory, with temperatures in London likely to hit 30 degrees celsius. The windows are all open. The builders across the way, drilling into old concrete, have a radio blaring out easy listening at top volume. Trucks and cars roar past. There are even people talking outside, for heaven's sake. How is anybody supposed to get any work done?

Well, the answer is that nobody much is working. In many continental European cities, where the summers are habitually very hot and uncomfortable but the offices don't all have air-conditioning, people start winding down their work as July arrives and go away for five or six weeks. Although less so than in the past, cities like Paris, Rome and Barcelona empty out during the heat and dust of summer, and the economy more or less slows to a halt.

Normally a near-total cessation in economic activity would be regarded by pundits as a cause for alarm. Yet there are enormous seasonal swings that dwarf the kinds of variation typical of a business cycle, and nobody bothers much about them. Christmas shopping, for example: about a fifth of all the money passing through the retailers' tills in a year is spent in the four weeks ahead of the holiday. Much of the rest is spent in the months when retailers normally hold their sales. To put some figures on this, American consumers spent \$219 billion in February 2001 compared with \$311 billion in December of that year, a 25% difference. Average weekly retail spending in the UK was £3.6 billion in a quiet month like February 2000 and £5.5 billion in December the same year, a variation of more than 50% between the quietest month in the shops and the busiest.

The weather is the cause of much seasonal variation in the economic statistics, and it is scandalously ignored by most economists. Thus demand for heat or air conditioning affects power generation and has a knock-on effect on oil extraction or coal mining. People are more likely to buy new clothes when there is an onset of much warmer or colder weather. Construction is slowed or halted by rain and blizzards. And the weather affects harvests and thus the output and

price of agricultural goods. Seasonality and other date-specific influences are too important for good practical economists to ignore.

Even the stockmarket is affected. Trading volumes on the London market always drop off on the days of one of the big summer sporting events such as the big race at Ascot or an international test match or an exciting Wimbledon semi-final. In the pre-broadband internet days (if any readers remember so far back), many employers post the latest scores on their internal computer networks so all the staff were not constantly dialling premium phone lines or surreptitiously listening to the radio to keep up.

Trading is also much quieter – sometimes by more than 20% compared with the recent average – on days that are simply hot. A 1993 study found a weather effect operates on Wall Street. The author argued that the weather had important psychological effects on share prices, with sunshine making investors more optimistic. A 2001 article reported that across 26 stockmarkets from 1982-1997 shares gained more than average on more than averagely sunny days, and less on cloudier than average days. On the New York market the difference was a 25% gain on a sunny day compared with a sub-9% rise on a cloudy day.

The explanation for lower volumes traded (as opposed to share prices) is no more complicated than the fact that traders are taking their lunch breaks out in the sunshine, away from their desks. It has been suggested that the Internet has increased the seasonality in trading. Private investors are particularly likely to spend an hour online if the weather is bad but hit the golf course instead on a fine day. It's not just sunshine, though. Some researchers have found stockmarkets do better around a new moon than a full moon, in 43 out of 48 markets analysed.

Statisticians do try to adjust most of the published data on the economy for seasonal variations, but it's tricky. They can only remove 'typical' seasonal swings. For example, if December retail sales have on average been 20% above the annual average for the past 10 years, they will roughly speaking remove 20 % from the raw, unadjusted December figure. (In practice it is a lot more complicated.) Even though many of the commonly used methods of seasonal adjustment tend to overcompensate for seasonal swings, this approach works pretty well when seasonal patterns change little from year to year, but not so well when they are more erratic. Thus it works much less well for weather-related seasonal fluctuations because the weather isn't so predictable from year to year.

This can make a big difference to commentators' interpretation of the state of the economy, prone as they are to getting over-excited about shifts of a few tenths of a percentage point in the growth of industrial output or inflation. Moves of this size can often be due to nothing more than a seasonal change in the current year that is bigger than normal and therefore not blotted out by the statisticians' seasonal adjustment process. Many economists are often guilty of completely ignoring seasonality.

One of my favourite examples was the fluctuation in the reported price of pork and bacon over a couple of years when a very damp summer followed a very hot one. According to the official statistician briefing journalists, pigs get much more amorous in hot weather (well, don't we all?). A glut of piglets one year was followed by a shortage the next, with the logical consequences for pig-meat prices. Although it looked like an upturn in meat prices was driving inflation higher, it wasn't necessarily anything to get worried about once you had looked into the explanation for it.

Some weather-related effects on the economy go much further than mere seasonal fluctuations. The El Nino effect is one example. During 'normal' seasons in the South Pacific there is a high-pressure system off the western coast of South America and a low pressure system off the eastern coast of Australia. That makes the prevailing winds easterly (that is, from east to west). Warm surface water is blown from the east towards Asia and Australia, causing precipitation in these regions to the benefit of agriculture and industry, while in the eastern Pacific cold but nutrient-rich water comes up from deeper in the ocean, making conditions for tropical fish ideal and boosting the South American fishing industry.

Unfortunately there are periodic variations in this pattern. During La Ninas, the pattern intensifies, taking ocean temperature much lower. During El Ninos the pattern is actually inverted, raising ocean temperature and blowing warm water towards the Pacific coast of the Americas.

The El Ninos tend to occur at three to seven year intervals and last for two years, and vary greatly in their intensity. There were especially severe examples in 1982-83 and 1997-98. The fishing industry in the Pacific waters of the Americas from Chile to British Columbia suffered enormously. In addition global atmospheric disturbance altered high-altitude jet stream

winds and affected weather patterns around the world. Both the severe recent El Ninos coincided with and perhaps contributed to periods of great economic turbulence too: the Latin American debt crisis in the first case and the South East Asian financial crisis in the second.

There is plenty of anecdotal evidence (in other words reports rather than statistics subjected to formal testing of hypotheses) about the damage El Ninos inflict on the economy. In the recent one Ecuador's rice crops were washed away, copper mines in Chile and Peru were flooded, Australia's wheat crops were damaged by drought, Indonesia suffered forest fires that also covered much of South East Asia in thick smogs, and its hydro-electric output was diminished by drought, Californian vegetable growers were affected by damp-loving pests, and some heavy ships could not pass through the Panama Canal because water levels were too low.

A recent, more systematic study by the International Monetary Fund confirmed that El Ninos contribute to higher global commodity prices, and thus tend to increase world inflation and reduce world growth. In fact, a fifth of the variation in world commodity prices over four year periods is accounted for by the fluctuating weather patterns. Not only the Pacific regions but also the predominantly northern hemisphere G7 countries are adversely affected. El Nino explains 10-20 % of the movement in consumer price inflation and world economic activity, according to the IMF.

Not surprisingly, some researchers have started to look at the impact of climate change on the world economy. One of the aspects of climate change could be the unexpected creation of new medium-term weather systems or destruction of existing patterns.

However, there is also a venerable strand of research dating back to 1884, that looks at a different natural cyclical phenomenon: sunspots, the erratic patches of unusual activity on the sun's surface. The economist William Stanley Jevons found there was a strong correlation between increases in sunspot activity, which vary in cycles ranging from 11 years to 100 years long, and commercial crises. The link was the weather and its impact on agricultural output, which was a far more important sector of the economy in the late 19th century.

Perhaps it should not be surprising that the bursting of the Nasdaq bubble in the 12 months after it peaked in March 2001 should have coincided with an upsurge in sunspot activity and solar storms so enormous it was feared they could put some of the web of communications

satellites around the earth out of action. (The loss of satellite communications was a new economic vulnerability that would have been unimaginable in Jevons' day.) Following Jevons a number of other studies looked at the impact of sunspots and atmospheric changes, so the global warming research follows in that tradition. And with climate change predicted to cause more droughts in some regions, more floods in others, and threaten an additional 290m people with malaria as warmer, wetter times favour mosquitos, this is an ominous matter.

Some researchers believe that climate plays an even more profound economic role than affecting the business cycle. In fact, they argue that geography is destiny. In his remarkable book, *Guns, Germs and Steel*, Jared Diamond, a professor of physiology at the University of California Medical School, argues that geography and climate explained different nations' economic destinies. Climate played a decisive role in the successful development of agriculture in some regions and not others, and explained why some societies were wiped out by disease or have never escaped its burden.

Africa, for example, has no native animals and relatively native few plants that could be domesticated easily. The tropics also harbour serious killers such as malaria, yellow fever and cholera, all still impediments to economic development. Spanish microbes famously wiped out more native Americans than the Conquistadors ever managed; the decline in the Indian population in the century following Columbus's arrival in the New World is estimated to have been as high as 95 %. But while European diseases proved lethal to native Americans, few Spaniards and Portuguese died of infections passed the other way. Diamond suggests exposure to domesticated animals meant Europeans had more resistance to pathogens, whereas the Americans had few domesticated animals and therefore scant resistance.

Some development economists (Jeffrey Sachs at Columbia University prominent amongst them) have started to argue that the effort to reduce poverty and boost growth in the world's poorest economies – mainly in Africa – must take account of the specific problems of climate. Specifically, it affects agricultural productivity, a third to a half lower in tropical than temperate countries, and human health. Sachs points out that only three out of the top 30 countries ranked by GDP per capita lie between latitudes 23.45 degrees north and south, and they are the tiny and atypical Hong Kong, Singapore and Mauritius. Average incomes in the 72 tropical countries with a third of the world's population are only a fifth of the average for (non-

socialist) temperate countries. (Sachs adds that having avoided socialism and war are also important factors contributing to economic development.)

This approach is still somewhat controversial. In fact, environmentalists have gone the other way, campaigning (not wholly successfully) for a ban on the use of the strong pesticide DDT, sprayed over vast areas of the Tropics to combat malaria by killing mosquitos. Their arguments ignored the human and economic impact of the disease, one of the world's biggest killers. But even many economists still prefer to focus on traditional concerns such as the amount of investment or the infrastructure of roads and electricity in addressing growth in low-income countries.

And even economists with a firm belief in the importance of geography, like Princeton's Paul Krugman, believe that while geography might have been destiny in the past, explaining why economic activity is concentrated where it is because of the presence of a navigable river or predominance of a disease, it is not inevitably so in future. Other factors apart from climate and rivers could be the piece of accidental grit that sows the pearl of economic growth.

Still, it's clear those of us sitting in the temperate zones should certainly count our blessings. Even in London, where a June that brings a month's worth of warm, sunny days is a once in a decade event.

Chapter Twenty-five

Work: Why bother?

“Remember that time is money. He that can earn ten shillings a day by his labour, and goes abroad or sits idle on half that day, though he spends but sixpence during his diversion or idleness, ought not to reckon that the only expense; he has really spent, or rather thrown away, five shillings besides.” So Benjamin Franklin lectured his readers in 1736 when the first rosy fingers of the dawn of the Industrial Revolution were visible on the horizon. It was such attitudes that led Max Weber, the early 20th century economist, to the famous conclusion that the work ethic lay at the heart of capitalism.

For all this emphasis on work, economics is actually based on the far more sensible assumption that people prefer leisure to work, and work mainly in order to earn income that will buy them other things they want like food and shelter, or designer shoes and movie tickets.

There is rather a lot of evidence in favour of the leisure ethic rather than the work ethic. The main piece of it is that people have been working less and less as they get better off. More than a century after Benjamin Franklin’s exhortations, in 1870 the typical worker in one of the world’s leading economies was putting in an average of 3,000 hours a year. That’s equivalent to nearly 58 hours a week every week with no holidays, or six days of more than nine and a half hours for each of the 52 weeks in a year. From 1870 until 1990, however, the amount of leisure time increased steadily. Holiday entitlements were raised. The retirement age dropped. A higher proportion of the workforce in most countries started to work part-time. And average hours clocked by full-timers declined. At different times and in different countries the most important reason for the falling off in working time varied. Nevertheless the result was that average annual hours worked in the industrialized countries fell to 2,000 in 1990, with only a small upturn in a few countries during the second world war interrupting the steady downward trend.

About a decade ago the trend did slow noticeably and even in some cases come to a halt, however. One or two countries, notably the United States, actually saw the first increase in hours worked for well over a century. In those countries that have seen a continuing decline in work it has reflected either new legislation, like the maximum 35-hour week introduced in France in

1999 and being implemented in stages, or an agreement between government, unions and big companies, as in Germany.

Looking beyond the rich OECD countries to those just outside the club, people work longer in the poorer countries, but especially in the ones where output is growing fastest. The pattern is that as countries go from low to middling incomes people work much longer hours – and also record big gains in productivity or in other words how much output each of them can produce per hour worked – so the economy grows rapidly and average standards of living rise. But when they grow richer still, hours of work decline and further improvements in living standards have to come from higher productivity alone. If they are not working longer, they can only get richer by working better. This is more difficult to do: the economy's growth rate is typically far slower in rich economies than in the middle-income but catching-up ones where hours of work are rising as well as effort.

Does this pattern make economic sense? Why should working hours rise then fall as a country develops, and why should there be a long-term downward trend in many countries? And why might that trend have been halted?

The story concerns the **supply of labour** – how much people are willing to work, and how effectively they do it. Long-term trends are related to the **supply side** of the economy, not to fluctuations in demand. The most basic principles of economics can indeed easily explain the observed pattern. People want to work in order to have an income, because they value the goods and services that can buy. On the other hand, most people prefer leisure to work.

This statement has to be qualified, of course. Some professionals simply love their work, or perhaps hate their families, so they face no dilemma at all. Having a job also brings status, company and a sense of belonging. But you could get all those benefits from working far fewer hours than many of us actually put in. On the whole most of us face a trade-off between leisure and income.

Economists can therefore draw an upward sloping labour supply curve on a graph representing the labour market. A higher hourly wage will draw forth more work because workers want an increased income.

But at very high wage rates this **income effect** can be outweighed by the **substitution effect** when enough people choose to enjoy more leisure instead. They can sustain the same income on fewer hours when the wage rate is high enough, so they substitute leisure for additional income. The labour supply curve becomes backward bending (or downward sloping) at those very high wages.

This is what you'd get charting the combinations of average pay and average hours for many countries. At low to middle incomes workers clock up more hours and incomes rise. At higher levels of prosperity, many workers might choose fewer hours and slower increases in income.

But that's not the end of the story. Surveys suggest the international differences also reflect different **preferences**. There are, after all, very wide variations between different countries at the same level of economic development. For example, the typical American or Japanese worker gets 10 days of holiday a year (excluding public holidays), whereas British workers get 21 days and Danish ones 30 days. It was only at the height of the 1990s boom that some US companies introduced extra vacation or innovations like 'time off banks' for scarce employees, and those experiments didn't last long once the economy turned down.

Likewise, about two fifths of Europeans report a preference for fewer hours over higher pay, two-thirds of part-time workers say they prefer part-time hours, and one in eight full-timers say they would prefer part-time work too, despite the fact that hourly pay amounts to less than three-quarters of the full-time rate on average. Opinion surveys in the United States on the other hand show a very strong preference for higher pay not shorter hours, and for full-time not part-time work.

Perhaps not surprisingly, half the new jobs created in Europe from 1987 to 1997 were part-time, increasing the proportion of part-time workers, whereas in the US (which created very many more jobs in total) the share in part-time work declined. In Europe it is mainly parents of young children who work part-time, while in the US it is students and older workers. In 1999, 13% of Americans worked part-time, compared with 15% in France, 17% in Germany, 23% in the UK and as many as 30% in the Netherlands.

It's hard to escape the conclusion, then, that the Europeans simply like leisure more than the Americans and Japanese do. While the trade-off between income and leisure applies to all workers everywhere, the different underlying preferences lead different groups to make different choices. How this translates into actual differences in living standards depends in turn on how many workers out of the potential workforce are working and on productivity levels in each country, or in other words how much output the economy is able to generate per worker hour. American workers not only work longer than others, but more of the adult population is in work.

The employment rate, or employment as a proportion of the population aged 15-64, in UK and US is about 73%, but in many other European countries the employment rate is as low as 50-60%. This reflects both stubbornly high unemployment and also low participation in the workforce by groups like married women, single parents, older workers close to retirement and young people under 25.

Not only do more Americans work, and put in longer hours, but they also work very productively. The average level of productivity per worker hour in the US is more than 20% ahead of the level in Britain. However, Britain is a bit of a productivity laggard. Both France and Germany, as well as Japan and a number of smaller European countries, have levels of productivity very close to the American standard, perhaps even a little higher on some measures.

The net result is that incomes per head are on average higher in America than almost everywhere else in the rich world. (Just a few smaller places like Monaco and Luxembourg can boast of a higher level, and they are scarcely typical.) The average American GDP per capita in 2006 was \$42,000 a year, compared to \$29,800 in Germany and \$21,900 for an average Korean (these per capita averages include children).

That's the payoff to all those hardworking Americans. But is money everything? While nobody would argue that high unemployment is a blot on the economic and social landscape, or that it is important to have a workforce that works well in terms of having a high level of productivity, most Europeans would rather stick with their short hours and long holidays. After all, the Continent invented *la dolce vita*, cafe society. If Europeans are poorer but just as happy or even happier than those overworked Americans, that's a good result as far as economists are concerned.

There is even some evidence about trends in happiness over time, gathered from surveys (which is just about the only way to measure happiness – by asking people). Being poor or unemployed definitely makes people unhappy, but the worst thing about unemployment is that it tends to make people poor. This is very clear to some of them. When unemployed French workers went on strike in 1999 (this really did happen – they blockaded government offices), they were striking for higher benefit payments, not jobs.

On both sides of the Atlantic there has been a slight upward trend in average reported levels of happiness over the years since 1970, but nothing like as big as the increase in incomes per capita over the same time. More money in the rich economies therefore isn't making anybody happier. What's more, while people working part-time or working for themselves at home report high levels of job satisfaction, contentment at work is dropping sharply amongst full-time employees.

In France (again) there has been an effort to tackle this dissatisfaction and simultaneously the high unemployment problem by limiting the legal work-week to a maximum of 35 hours. It has clearly made French workers much happier and proved a vote-winner. It might well have created some extra jobs because the measure was introduced at a time when the economy was growing strongly, so employers did not use shorter average hours as a means to cutting back total output.

However, it is hard to declare the experiment a resounding economic success. For the government also guaranteed that nobody would suffer a pay cut from the shorter hours, and has so far subsidized employers in order to meet that promise. Otherwise the reduction to a 35 hour week would have needed a big jump in productivity per worker hour to justify the increased hourly wage. (If wages in real terms run ahead of productivity then profits, output and employment will fall.) Either productivity levels in France must rise significantly, allowing the government to phase out the subsidy without denting levels of employment and output, or the taxpayer will have to continue meeting a pretty big bill.

So although money doesn't buy happiness, it is a pre-condition for it. As for work, that's the pre-condition for money. But economists want you to be happy, not just rich and definitely not overworked.

EPILOGUE

In Praise of Economics

An awful lot of rubbish is talked about economics on TV and radio, in newspapers and magazines, by people who are complete ignoramuses on the subject. I wouldn't dream of setting myself up as an expert on medicine or earthquakes in order to regurgitate whatever titbits of information I'd picked up from my reading, but it appears no such qualms deter a lot of so-called economic pundits.

They get away with it because the economics profession has such a bad reputation, usually described as being out of touch with reality. Economists are criticized for becoming over-reliant on abstruse mathematics. If you open any of the leading economics journals it is indeed full of frightening-looking algebra, symbolic 'models' of the reality the author is seeking to analyse. Yet as one of those 'out-of-touch' economists, I naturally feel this criticism is very unfair. After all, most economists are very practical researchers who, more than experts in any other social science and in fact more than almost any other discipline at all, grub around in data and wallow in statistics.

In fact, professional economics is becoming less and less purely abstract, more and more applied to 'real world' issues. Partha Dasgupta, professor of Economics at Cambridge University, counted how many articles in the flagship American Economic Review over a recent five-year period were theoretical rather than applied and empirical. The tally was 25 pure theory, 100 applied theory (trying to find a theoretical explanation for an observed fact) and 156 empirical or experimental. More than 90% of the total in other words was concerned with the "real world". In a similar vein, Paul Krugman, at Princeton, has pointed out that there were just two theorists amongst the 10 previous winners of the John Bates Clark medal, the American Economic Association's highly coveted award for young economists. Both of those specialized in issues of information and uncertainty. Three others had taken top policy jobs (Council of Economic Advisers, World Bank, US Treasury), while the rest all concentrated on applied research of various kinds.

Economics as a subject isn't even a fixed body of knowledge or set of facts to learn. It is not defined by the questions it addresses. It's a social science, and the problems to be solved depend on what is happening in society, and change with society. So it is about things like

money and jobs and shopping and trade, but looks at them in a particular way, as the earlier essays in this book have demonstrated. The eminent economist Lionel Robbins defined it as a study of how humans tried to attain their aims given scarce resources that had alternative uses.

In other words, economics is about how and why people make choices. As this changes, the body of knowledge that makes up economics will alter too. John Maynard Keynes, one of the most famous practitioners of the subject ever, summed this up perfectly in reply to one of his critics: “When the facts change, I change my mind. What do you do, sir?” The conclusions are not fixed. Economics is an attitude rather than a set of findings, a process of applying intelligent scepticism to almost any issue. Its most fundamental question is: *why?*

So it’s a puzzle. Here’s a discipline that is actually shaped by what’s going on in the world and tries to understand it. It’s becoming increasingly empirical. Why, then, the reputation for being remote from real problems? I think there are three aspects to the answer. In descending order of triviality they are:

One, that a lot of the critics of economics can’t do mathematics (and a lot of the equations in the journals are concerned with statistics and empirical research, not theory) and resent its use in a social science which they feel they ought to be able to contribute opinions on;

Two, the conclusions of economics often run against ‘common sense’ and received wisdom, especially the conventional wisdom in other social sciences and the humanities.. These scholars just don’t believe the scientific method applies to the analysis of power or culture. Economists do themselves no favours by using impenetrable jargon;

Three, macroeconomics, the study of the economy as a whole and what most people think of as ‘economics’, has repeatedly over-reached itself by pinning strong policy conclusions on elegant theories that cannot possibly capture the complexity of what actually happens in the world.

I want to address the second and third of these points. On the first there’s not much more to say, except to point out that many pundits and journalists, mostly arts graduates, still think it’s a bit of a joke or perhaps even a matter of pride to be innumerate. There’s even a vogue for claiming that mathematics has become too important altogether, creating in our societies an

undue reverence for numbers. If only. Undue ignorance, more like. This attitude poisons public understanding of science as well as economics. Such people would be appalled by scientists who boasted about never reading a novel or having heard of Beethoven. They should be ashamed of themselves.

The tyranny of common sense

The critics of economics get a far wider audience than the economists. Some of them are economists themselves, making a perfectly reasonable or even a profound criticism, but in a tone that suggests no other economist has ever thought of it before, which is very irksome.

Other critics, some of the most influential, have been published in literary or cultural magazines like the *New York Review of Books* and *The New Yorker* and are sometimes actively misleading. That is what you might expect of a critique written by an outsider, but the cultural magazines unfortunately reach an important intellectual audience that routinely belittles economics as a result of such articles. There is a wide gap between economists and other social scientists and intellectuals. Literary editors of course know literary people, not economists, and the lack of communication between the two species is compounded by the fact that so many economists can barely write simple, readable prose.¹ In this they're exactly like some other academics, who all do much better in their careers by writing for professional journals in obscure jargon rather than in newspapers and books for the general public (although they then grow bitter and twisted about their colleagues who do gain a public profile by communicating well). Just check out the recent academic journals on literary criticism or history for their obscurity.²

The criticisms tend to overlap on one point: professional economics is 'too mathematical', depends too much on writing down human behaviour as algebra, in applying the scientific method to social life. It's hard to avoid the suspicion however that many of these critics just find mathematics too difficult, but they daren't criticize a natural science like biology or

¹ Not for nothing is this one of the funniest professional jokes: what do you get when you cross an economist with a Mafia don? An offer you can't understand.

² In one highly enjoyable practical joke, a physicist, Alan Sokal, submitted to the American cultural studies journal *Social Text* a hoax article parodying the tendency of intellectuals in cultural studies to sprinkle their writing with concepts and terms that were supposedly drawn from science but were in fact meaningless. *Social Text* published the parody in all seriousness in 1996. Sokal went on to write a book with fellow physicist Jean Bricmont, *Intellectual Impostures*, attacking the abuse of scientific concepts in post-modern philosophy and cultural and literary theory. The charge was that these disciplines are, absolutely literally, utter nonsense. The cultural theorists were not amused.

physics for being too mathematical for fear of looking ignorant. They can get away with it writing about a social science, though.

Is there any substance to the complaint? Does it make any sense to try to capture the intricacies of human behaviour in equations? Not all equations are algebraic representations of humanity -- in fact, some equations are essential. Paul Krugman, one of today's best and most accessible economists, repeatedly points out that there are the equations that capture the fundamental logical truth that the things that add up must add up.

For example, some critics of globalisation will argue that multinationals are relocating jobs in developing countries, producing cheap goods they export back to their home countries while at the same time paying exploitation wages to their poor employees. This will sound perfectly reasonable to the casual reader. But it can't be true that developing countries are simultaneously attracting large inflows of foreign investment and running large trade surpluses because they're exporting to rich countries more than they import. The point about the balance of payments is that it has to balance. One bit of it is the capital account, or flows of finance into or out of the country. The other bit is the current account, the flows of goods and services. A country buying more goods and services from abroad than it sells to foreigners (like the US) has to pay for this deficit by borrowing money in various forms, like bonds and shares, from foreigners. To put it another and more technical way, net inflows on the capital account must correspond to outflows – that is, trade deficits – on the current account. Typically, the two come into balance in the case of the rapidly developing countries because an inflow of investment creates jobs which boost wages and living standards so they are importing capital equipment (investors building factories) and also consumer goods in greater quantities than they export them.. Economists like Krugman – not all are as good or as intellectually honest - will bother to check the facts, and discover that real wages in many developing countries have been rising rapidly during the modern era of globalisation. And recipients of foreign investment – not just developing countries but also the US and UK in the recent past - run trade deficits.

So while it's true that much of what economists say is based on ideology not science, some of the abstract equations with which they dazzle everybody are genuinely important. In fact, many critics criticize the use of mathematics in economics precisely because they hate to let evidence and logic get in the way of a good story based on their own ideological or political

views. This starts getting to the heart of why economists are unpopular, I think. A lot of economic truths simply don't tally with 'common sense' or conventional wisdom.

The economist David Henderson has labelled this sort of incorrect common sense 'do-it-yourself economics'. He has collected a list of such DIY notions, all wrong, and also prominent exponents ranging from business leaders to senior judges, the President of the World Bank to the Archbishop of Canterbury. Consider some of its precepts (and why they are wrong).

- Exports are good for a nation, imports bad. (*The truth is the main gain from trade is cheaper imports and wider consumer choice. Exporting is what you do to pay for imports.*)
- Industries can be ranked in order of national importance or priority, and the most important deserve government support. (*Energy, obviously is of national importance, but should the energy source be coal, which now accounts for only 6% of world energy supply, or oil? Or the increasingly important natural gas? Or renewables? Yes, solar power! Or perhaps hydrogen fuel cells? Oh, and food, also obviously vitally important. McDonald's is a clear case for subsidy, accounting as it does for such an important part of the national diet. Did somebody mention telegraphy? The point is that nobody, not even – especially – governments, can tell which industries will be important. Changing demands and technology will overtake any list.*)
- A shorter legal working week will reduce unemployment. (*In fact it won't unless matched by a smaller paycheck. It will raise employers' costs of producing a certain level of output and will therefore increase unemployment. The French 35 hour week hasn't done so only because the government is spending a fortune in taxpayers' money subsidising wage bills. However, French voters are happy for the time being.*)
- More immigration will reduce the number of jobs available to native-born workers. (*The truth is an extra supply of workers will reduce wages in some occupations and thereby increase the number of jobs. The cost of immigration to the native born may be a lower wage for certain kinds of work, usually unskilled, although in practice only booming economies attract immigrants so this penalty rarely seems to occur. There's no fixed number of jobs to go around – the total depends on the price of labour.*)
- Labour-saving technologies destroy jobs. (*The truth is that labour-saving technologies cut costs, and if they involve new products also stimulate demand. They therefore create jobs as long as the economy as a whole is expanding. It's the same as the previous error,*

known to economists as the ‘lump of labour fallacy’, the presumption that there’s only so much work to do. There are whole books written around this basic DIY error.)

The fact that in all these examples the truth is so counter-intuitive demonstrates exactly why economics can offer rich and unexpected insights.

Getting a grip on the facts

One of the most important areas of economics is concerned with the factual realities: econometrics, which applies statistical theory to raw data using computers in order to try and uncover the way the economy operates.

The pioneer of programmable computers was Charles Babbage, an enormously creative and hugely obstreperous scientist who lived from 1791 to 1871. To celebrate the bicentenary of his birth London’s Science Museum built the first ever working version of Babbage’s ‘Second Difference Engine’ (his First was never built in his own lifetime either), and it is still on display in the museum, a beautiful array of gleaming brass cogs and numbered wheels.

To anyone under a certain age, the computers that researchers were using as late as the 1980s will seem almost as antiquated. It wasn’t until the middle of that decade that desktop PCs started to become reasonably commonplace, and for another five or ten years those desktop machines were not powerful enough to cope with more than pretty small amounts of data. When I was a student we had to eke out accounts on big timeshare computers the size of large tables, which had rows of ‘dumb’ terminals in the university science centre hooked up to them. It was cheaper to run programs overnight, so that meant either staying up, or submitting batched programs and leaving them, but not finding out until the next day that they hadn’t worked, and then waiting until the night after to correct the problem. Most big sets of data came on tapes that had to be loaded by specialist operators allowed into the inner sanctum, the cool, white room that contained The Computer.

There was almost no off-the-shelf software, either. There was just one package available to do econometrics, as the practice of introducing economic theory to real life data is known. It could do only the simplest procedures. Anything more sophisticated, and you had to program it yourself in a computer language like Fortran.

It's much easier now, of course. There are numerous software packages suitable for economists, and many of the professional journals carry software reviews. The packages make econometrics a doddle: read in the data from a spreadsheet, try out a few equations. If they don't work, try out some others. Add a few extra variables, look for the equations whose diagnostic tests give the best results, and there you are. Econometrics at the press of a few buttons. Easy.

Unfortunately, it's all too easy. One 1996 study found that statistical inference had been incorrectly used in a large majority of the articles published in the previous decade in the *American Economic Review*, one of the premier professional journals. Most economists are, rightly, somewhat sceptical about much of the empirical research that is published. There is a lot of pretty bad econometrics around, based on the presumption that the computers make thinking redundant. Nothing could be further from the truth: computer power and thought are complements, not substitutes.

So the first step when contemplating applying economic theory to actual data is to engage the brain. Data come in different forms. Time series, often macroeconomic variables like GDP or inflation, have one observation per unit of time – day or month or year. Cross sections have observations for a range of variables all at the same time, such as income, job status, highest education qualification attained, number of siblings, ethnic origin and gender for a large number of people. Panel data combine cross-section and time-series information, such as all these every other year for ten years, or GDP, working age population, capital stock and investment for fifty countries over 25 years.

Theories usually contain some pretty broad brush implications about life and often you can tell whether or not a theory is going to work in practice by looking at a broad brush outline of the data. Often, the best first step is to plot the data on a graph or just look at it in a spreadsheet. Firstly, this will make it more likely that massive errors are spotted, like somebody entering the figures with an extra zero or missing decimal point in a few places. Secondly, events like big strikes or earthquakes often lead to massive spikes in time series that bear no relation to any economic theory you might want to test, and need neutralising (by including a 'dummy variable' in the equations).

Most important of all, it is really vital just to get a feel for what the evidence is like. If you have no idea what size the economy is – the actual level of GDP – you have no means of

assessing how important events are. If retail sales over the holidays are \$100m down on last year, how much does it matter? How big \$100m is depends on the size of total retail spending or the total economy. How outrageous a demand is it when farmers want an extra \$50billion in subsidy? Likewise, to know whether a tax cut worth \$100 a year to each taxpayer will boost the economy, it helps to know what average income is.

The point is that looking at the data is about applying intelligent scepticism by the truckload. 'Can that be right? What's the evidence? How important is that? Does it really go down that much?' and so on are key questions.

Plenty of 'facts' bandied around in print or on TV are no such thing. For example, it is often claimed that income inequality is greater in the UK than anywhere in Continental Europe. In fact, it's not. Income inequality has increased faster in the UK since about 1980 but the degree of inequality is roughly similar in France and Italy. Another example of a bogus 'fact' is the claim that since the Reagan era, privatisation means the size of government has been shrinking. In fact, it has not, not outside the former communist countries. In most places the share of government spending in GDP has continued to rise.

Many people who ought to know better, pundits and journalists, politicians and even some academics, play fast and loose with the facts or even ignore them altogether. To a good economist evidence is all-important. The search for evidence is what makes economics a science. Unlike some (but not all) natural sciences, the findings of economics are seldom capable of refutation. The possibility of disproving a theory is usually taken as the basis of the scientific method, because if a statement isn't capable of being shown to be wrong (as well as right) by other researchers there's not much to distinguish it from a non-scientific belief or intuition. Still, a lot of economic evidence is too broad-brush to be able to distinguish between competing theories, especially in macroeconomics. Experiments too are difficult in economics, although not impossible.

The heart of the subject is nevertheless a deep respect for discovering what's true about the world. Of course economists are as capable as anybody else, including scientists, of ignoring evidence that doesn't support their existing set of beliefs and ideology. Yet the very nature of the subject makes this bad economics.

Economists often talk about the ‘stylised facts’, by which they mean the broad brush outlines of reality with which a successful theory should be consistent. For example, real wages tend to rise when an economy is in an upturn and fall when there is a downturn. This was a headache for the kind of rational business cycle model (briefly fashionable when I was a student) that said economic ups and downs were due to supply-side shocks, meaning real wages ought to fall during an expansion to induce employers to hire more people. The fact that the actual moves went the opposite way rightly helped write off the theory.

Sometimes, though, theory can help write off supposed facts, as in the earlier example in about companies supposedly exporting jobs by building factories in low-wage countries and importing the cheap goods made there back home. It can’t all add up in theory, and indeed some of the ‘facts’ in it are incorrect.

Anybody going on to do much economics will soon find themselves plunged into the detailed statistical theory that underpins econometrics. This forms a big part of the ‘abstract mathematics’ for which non-economists often criticize the subject, although its purpose is precisely the opposite, and actually puts real world flesh on theoretical bones. That is precisely the problem for critics who would prefer to cling to their preferred theories than have economists overturn them with evidence.

Flawed macroeconomics

A lot of the generalized criticism about economics concerns macroeconomics, the study of the economy as a whole. It stands in contrast to microeconomics, the study of specific parts of the economy. These prefixes derive from the ancient Greek for big and small. Economies are made up of millions of individuals, hundreds or thousands of separate industries. In principle, adding up all the individual decisions by consumers or business executives or investors or government officials would give you the big picture.

Unfortunately, the top-down and bottom-up approaches don’t actually meet in the middle. There is a chasm between macroeconomics and microeconomics; economists have yet to find a bridge between the two. Indeed, they remain two more or less separate subjects, and are in different states of health at present. Many of today’s professional economists are very uneasy about making sweeping pronouncements on the future of capitalism or the nature of class struggle in modern societies. They know there’s no empirical evidence, no refutable facts, to

back up any pronouncements on such sweeping issues - in real contrast to the microeconomics where they are confident about having a solid body of results that explains a lot about human behaviour.

The lack of confidence amongst macroeconomists is justified. For all of my lifetime there have been competing schools of thought about how the macroeconomy works, a sure sign that nobody actually knows.

Looking back, these bitter disputes amongst macro-economists seem rather quaint. Some of them are ancient history, unknown even to professional economists. In my adult life, the first great clash was Keynesians versus Monetarists. It boiled down to a disagreement about whether wise policy-makers could fine-tune the level of output or rate of growth of the economy by making monetary and fiscal adjustments (so-called Keynesians) or on the contrary could only manipulate the rate of inflation, by monetary adjustments (monetarists). The Keynesians lost when it became blatantly obvious that they could not fix growth and inflation as they had been confidently proclaiming. (Mea culpa, I was a young Keynesian, but then so was anybody with progressive politics in the 1970s.)

Next came a row between 'real business cycle' or 'new classical' or 'rational expectations' theorists and post-Keynesians. The former argued that as people are rational, fluctuations in the level of demand in the economy must reflect 'supply side' changes such as a sudden improvement in technology to which everybody was reacting rationally. The post-Keynesians could be loosely described as anybody who didn't believe anything quite so daft.

The rational expectations idea wasn't totally mad. The presumption at its heart, that people will not be so foolish as to consistently ignore opportunities to profit or increase their incomes or whatever, is very powerful and has influenced much macroeconomic research to this day. It has something going for it. For example, many non-economists mock the idea that the stockmarket is at all rational or efficient: although irrational psychology is obviously important in investor behaviour, it's also true that investment managers do not on average beat the market, indicating that there are few opportunities for profit that are not already exploited. The marriage of the tools and insight of rational expectations (why would people consistently believe something that's false?) to a study of the imperfections and market failures of the real world has produced some very fruitful research.

Whatever the merits of one school or another, though, the point is that if there is scope for distinct schools of thought at all, this is not hard science. It's more like the debate about whether the earth is flat and held up by an elephant and four tortoises or whether it's round and orbited by the Sun and the rest of the universe. There might just be elements of truth in one school of thought but none of them is likely to have uncovered the full story. Analysing a whole economy is always going to be difficult and controversial. For one thing, there isn't all that much data available to test competing theories: the economy changes so much it doesn't make much sense to take what happened before 1980, say, as good evidence for what might happen in 2005. At best an economist has perhaps 20 years' worth of statistics, some available monthly, or almost continuously in the financial markets, but some only quarterly or annual. Given that one month's price level is really very similar to the next month's, there isn't even all that much information in the separate pieces of data.

What's more, an economy consists of millions and millions of people and companies. In a global economy with so many international links through trade, investment and migration, anything that happens anywhere is bound to involve tens or hundreds of millions of decisions made by people all reacting to whatever they can see happening in the world.

This is an insight that has led to an interesting line of thought that says it's possible to make some theoretical statements about the economy as a whole, but these do not translate into easily usable principles and policies. It stems from the application of complexity theory, developed in the natural sciences, to economics.

Put simply, complexity sounds pretty obvious. It says people (or ants or molecules) influence each other in the many choices they make. This is a contrast to conventional macroeconomics which assumes people make their decisions about what to spend, where to invest, how hard to work, independent from facts like the level of interest rates or level of company profits, and their own tastes and preferences. Adding something as sensible as the natural human tendency to be swayed by what others are doing means, however, that a lot of standard economic presumptions don't work.

Fans of complexity theory overdo their claims about undermining all of past economics. Actually, economic thinking can easily take account of many of the phenomena beloved of

complexity theorists. For example, increasing returns to scale in certain industries that arise from ‘network effects’ (the price I pay depends on how many of you have already purchased the item) as described in an earlier chapter, certainly don’t undermine economics. Respected, and conventional, academic economists are doing a lot of research along these lines, especially in finance, trade theory, economic geography, and industrial organisation.

Complexity, however, does seem to pose a challenge to conventional macroeconomics. It torpedoes the machine metaphor that underlies most day-to-day forecasting and comment. Indeed, in the recesses of the London School of Economics there is a machine – called the Phillips Machine after its creator - representing the flow of income in the economy, with coloured water flowing along tubes to indicate the pace of consumer spending, and valves to indicate the tightness or otherwise of monetary policy. But it gives a bogus impression that it’s possible to fine-tune the economy with a bit of twiddling here and there. Bogus because there will not be a fixed relationship between the amount spent by consumers and ‘levers’ like interest rates or government spending if you also factor in individual consumers being influenced by fashions, general ‘feelgood’ mood, or herd psychology in the stockmarket. The economy is not controllable, at least in any straightforward mechanical way. Perhaps a machine was a good metaphor in the immediate post-war era when even in non-communist countries the economy was in fact much more highly regulated and controlled. It no longer holds good in modern, liberalized economies. Policy-makers now are more like sports coaches than engineers, trying to psych the players – us- on to a good result.

Macroeconomic forecasting in particular is highly misleading, essentially because where the economy gets to in future depends on what millions of us do between now and then. In general, this way of thinking about the economy introduces all sorts of self-fulfilling phenomena.

This isn’t a new idea to economists. In a very famous passage in his most famous book, *The General Theory of Employment, Interest and Money*, John Maynard Keynes, who was himself a successful investor, said investing in shares was like picking the winner in a beauty contest. You wanted to choose the contestant most likely to appeal to most judges.

“Professional investment may be likened to those newspaper competitions in which the competitors have to pick out the six prettiest faces from a hundred photographs, the prize being awarded to the competitor whose choice most nearly corresponds to the average preferences of

the competitors as a whole; so that each has to pick, not those faces which he himself finds the prettiest, but those which he thinks likeliest to catch the fancy of the other competitors, all of whom are looking at the problem from the same point of view.”

It applies not only to stockmarket bubbles but also to general booms and recessions. A recession is a collective outcome that can feed on itself in a vicious spiral. It emerges in the way a storm does, if you're think about the weather as an analogy. Macroeconomic forecasting is really quite like weather forecasting. You can spot short-term tendencies and possibilities, might even be able to predict rain ahead with great confidence, but any greater precision in the forecast will be spurious.

Many macroeconomists are entirely comfortable with this conclusion, and indeed would quite like to educate the general public that sensible forecasts would be something like: “There's a 75% chance inflation will be above 2% by the end of next year.” But we all feel rather comfortable with the appearance of confidence: “Consumer prices will be rising by 2.4% in 18 months' time.” The only thing that annoys them about attacks from fans of a complexity approach, or any other alternative, are critics' assertions that economics is hopeless especially in crisis because economists doggedly insist on stupidly reductive and simplistic formal models. Most practising economists regard the models as a tool and are well aware of their shortcomings in the face of the complexities of real life.

Still, this leaves macroeconomic theory in an uncomfortable position. Any textbook will reveal it still rests on formal models of fixed equations - some of which capture genuine insights, but which don't add up to a tool for usefully analysing or forecasting the economy as a whole. Unfortunately, there's nothing to put in its place which would satisfy the ambition that some critics set for macroeconomics, namely aggregating the behaviour of millions of people who are not fully rational, who don't have complete information about everything, who make short-sighted decisions, who are all different, who sway each other's behaviour, and who live in economies where there are all sorts of obstacles to free and competitive markets.

Since the ideological clashes of the 1970s and 80s, there has been an appreciation amongst economists that it might be a good idea to make far more modest claims to be able to understand and predict on the macro front. There is a greater degree of consensus now about

what constitutes bad macro-economic policy, thanks in large part to the disastrous results of putting once-fashionable economic theories into practice.

The professional consensus now about macro policy can be summed up as: don't make dumb mistakes. Keep inflation low, because it's economically damaging, unfair, and voters hate it. Get central bankers, who hate inflation too, to keep it low. They've been doing it pretty well for a decade now, using a variety of approaches (too well in Japan, where as we saw prices are falling).

A high rate of growth is good, but so is a steady rate of growth. The voters hate boom and bust, or at any rate the bust part of it. That means making sure government borrowing isn't too high or the government surplus isn't too big, because the government's not the point of the economy, businesses and consumers are. There are still heated arguments, of course, about whether interest rates or tax and spending have been set at the right levels. But the argument covers a much narrower range of options than before.

Forecasting the economy

This new modesty must be an improvement on the macroeconomists' earlier incarnation as snake oil salesmen. The failures of that over-confidence are demonstrated only too clearly by the dismal record of most macro-economic forecasts, an important source of the disrespect in which economics is held by outsiders.

When the American economy was growing rapidly year after year in the late 1990s, the International Monetary Fund (with one of the biggest teams of macroeconomists working anywhere) for several years kept incorrectly predicting the rate of growth would slow next year. At one of the press conferences on its World Economic Outlook, a journalist asked Michael Mussa, then the IMF's economic counsellor, about why after all this he was still forecasting US growth would slow next year. "We're going to carry on forecasting the US economy will slow down until the economy gets it right," was Mussa's answer. The economy, of course, overdid it. The IMF was forecasting 3.2% GDP growth in the US in October 2000. By May 2001 it had revised this down, and then it revised the figure part-way back up in April 2002.

Expecting economists to forecast the future state of the world, in precise numbers, is slightly weird. No other profession faces the same demand. Besides, there's a good reason

forecasts tend to be wrong. They are based on a series of equations in a computer ‘model’ of the whole economy. The equations linking different indicators, like consumer spending to after-tax incomes and share prices, are estimated using about 20 years’-worth of data. These relationships are then used to run the whole model forward into the future. But they inevitably capture a 20-year average experience, and therefore inevitably predict the future will be a lot like the average of the past 20 years, unless the forecaster deliberately overrides the predictions using his or her skill and judgement. So models produce bland pictures of the future. They are very bad at forecasting extreme events like recessions. They are pretty bad anyway whenever the economy changes because what’s new is not incorporated into the estimated equations – and just compare the American economy of 2000 or 1990 with 1980.

It’s no surprise, then, that errors in making macroeconomic forecasts are typically large. Still, there is a need for macroeconomic forecasts in order to allow governments to design and implement sensible policies, or businesses to draw up profitable strategies. That inevitably involves trying to look into the future – ‘If we try this, then what happens? And what about if we try something else?’ The demands for economists to produce forecasts are intense, and most of macro-econometrics is geared towards forecasting what’s going to happen to output, prices, interest rates and currencies, unemployment, poverty levels and so on.

Indeed, expectations of economic forecasts are simultaneously extraordinarily high and very low, for economists are expected to foretell the future with a degree of authority we’d never demand of a meteorologist or biologist, and – not surprisingly – are held in low esteem for often getting it badly wrong. Many forecasts are extremely bad - perhaps inevitably so, as we saw in the last chapter. As David Hendry, an eminent econometrician based at Oxford, has complained: “When weather forecasts go awry, meteorologists get a new supercomputer; when economists mis-forecast, we get our budgets cut.”

The trouble is that consumers of economic forecasts are keen on certainty, even if it is bound to be wrong. We want to *know* what’s going to happen! We are both unused to and unhappy about being told there are great uncertainties about how the economy will look a year from now. However, forecasts should spell out the uncertainties, in the form of ranges of confidence about their predictions. Many official forecasts, like those published by the Federal Reserve Board or Bank of England, do just this. The Fed will predict growth next year will be in a range, say 2-2.5%.

Shockingly, many other forecasters have next to no idea what the confidence intervals are on their spuriously accurate predictions. Public understanding of probability is shockingly low too, and there seem to be psychological barriers to being logical about it.

Still, the biggest difficulty in predicting how the economy as a whole will evolve is that the future is not at all like the past. The past 40-plus years have been completely different from any episode in human history beforehand. The real income of the average person in the world has more than doubled since 1950 – unevenly, it is true, but nothing like it has ever happened before. More than half the people who have ever been alive since the dawn of time are alive now. Over the past two centuries, GDP per capita in the leading economies has grown by about 2% a year - but the standard errors in forecasting this growth are about 2.5%, or in other words in excess of the thing being forecast. The trouble is that events, ‘structural breaks’ in economics-speak, keep butting in. Events like the Industrial Revolution, fascism, feminism, and world wars, or innovations like electricity, the internal combustion engine, and the computer.

It’s impossible to tell what it is about the present that will transform the economy, although many experts hold strong opinions about it one way or another. For example, the Industrial Revolution was seen by most contemporaries as a thoroughly bad thing, destabilising society and covering the countryside with those ‘dark, Satanic mills’ – not as a set of events that would, after 50 or 70 years, for the first time in history liberate most people from grinding poverty and short, diseased lives. The economy is constantly being shaped by technology, politics and society. So how is it possible or sensible to take a long look ahead at how it will evolve?

We certainly want to know what will happen in future. To echo Macbeth:

“If you can look into the seeds of time
And say which grain will grow and which will not,
Then speak to me.”

The problem is, in the less poetic language of econometrics, that macroeconomic data are usually non-stationary. The mean or average value of the variable, and its variability around that mean, alter over time. David Hendry gives the growth of industrial output in Britain since 1715 as an example. The average rate of growth ranged from 0.86% a year in 1715-50 to 2.86% a year in 1801-50. The standard deviation (the measure of ‘typical’ variability) ranged from 3.5% in that

early period to 6.3% in 1901-50, a period including the 1919-21 crash, the Great Depression and two wars. Even the rate of change of growth in production, its acceleration or deceleration, altered a lot over time.

The frequency and importance of structural changes mean that most conventional econometric models are incorrect, in unknown ways, and in ways that change as the economy changes. There are some things we know we don't know, and some things we don't know we don't know. To make matters worse, we know that most economic variables are also inaccurately measured to there is additional uncertainty introduced by the data used. Yet conventional forecasting assumes that the model used is a correct specification of a stationary economy, not an incorrect specification of a non-stationary one.

The way forward in forecasting

Luckily, modern econometrics does offer techniques for coping, for narrowing the inevitable range of uncertainty attached to any forecast. Some of it is quite simple. First, forecast growth rates, not levels (first difference the data). That makes it less important to get the absolute level right, so any mistake you make here will show up as a one-off 'blip' error in the forecast. Secondly, if go one step further (second difference the data), so you are forecasting rate of acceleration, you can similarly neutralise any linear time trend in the series. Two simple steps can therefore tackle the most basic misspecifications of an econometric equation, getting the wrong intercept and the wrong trend.

Another good tip is to update estimated equations pretty often, using the most recent data. Many forecasts are in practice based on very old computer models, and the economists driving them deal with forecasts that are obviously going adrift by over-riding the predictions with their own judgement. In the trade, it's known as adjusting the 'residuals' or 'add-factors'. The variable being forecast can be sorted into two parts, the bit that is actually produced by the equation for that variable, and the residual. In creaky old models the residual can easily be the most important component of a forecast value. Forecasters can also learn from their errors. If an equation turns out to have produced a big error last quarter, the error can be added to the intercept term in the equation for forecasting the next quarter.

A final point is that sometimes forecasts are wrong because they affect behaviour, and sometimes they are self-fulfilling for the same reason. If an authoritative institute predicts a

recession or a collapse in the currency, people might act on that, cutting their investment plans, postponing buying a car in case they lose their job, selling the currency if they are a speculator. On the other hand, the central bank might react by cutting interest rates to avert the danger of a slowdown, and the forecast would turn out to be wrong even if it had originally been right.

In short, economic forecasters have to stop believing – or allowing the rest of the world to believe – that what they do is set down a simplified but essentially true version of the structure of the economy. Macroeconomic forecasting is now a lot more pragmatic than that, a kind of guerilla warfare waged against the tides of history, the ambiguities of the data and the sheer unpredictability of all the millions of people whose behaviour is being forecast.

There is, too, a much greater respect now for the gritty details of the real world rather than the abstractions of grand theories, and this must be good news too. There has been a resurgence of interest in institutions and in economic history, kindled to a large extent by the process of globalisation.

For example, why is the same person many times more productive the minute he moves from Haiti to the United States to do the same job? It can't be anything to do with the person, who hasn't changed, or the nature of the job, which is the same, so it must be something to do with America having institutions and arrangements that enhance the capacity of individuals. Why do countries that seem very similar in terms of the availability of technology and skills of the workforce, like the US and Germany, have different rates of productivity growth? The answer seems to be that it depends partly on a host of details like their different traditions in raising finance, legal traditions, planning laws, openness to immigration and so on. What is it about developing countries that keeps them poor when technology and finance for investment are more freely available anywhere than they have been for more than a century?

Such questions have generated a fascinating research agenda, because the broad answers stimulate a demand to know *exactly* what it is about, say, bankruptcy legislation, that helps or hinders enterprise. And the new focus on institutions is also a healthy reminder that successful economies as well as unsuccessful ones take many shapes. There is no such thing as a 'market economy' or 'capitalism' in the abstract but only in specific forms. Therefore any macroeconomic principles will be generalisations too, which will work in slightly different ways in different settings.

Similarly, economic history has enjoyed a revival thanks to the advent of today's new technologies like the Internet and the question of whether or not it will lay the foundation for improved productivity in future. Previous episodes of technological change offer some of the only sort of evidence available. And one of the main lessons is that the economic impact of technology depends on the institutional and political context too. Another is that, in a variation on the old joke about how to get into town from here, if you want to get somewhere a lot more desirable, some starting points are a lot worse than others. The past shapes the economy's possible futures.

The success story of microeconomics

Reflecting on their failure to be able to explain or forecast the economy as a whole, macroeconomists lack a certain intellectual buoyancy at present. Their subject matter is as exciting as ever – more so, with globalisation, financial crises and the 'New Economy' boom and bust to think about. But there are no hot new fashions in macro theory, nor do the brightest graduate students tend to flock to macroeconomics, as so many did in the 1970s and 80s.

On the other hand, most of microeconomics, the study of economic behaviour at the scale of the individual, the household, the business or perhaps the industry, has been enjoying an extraordinarily productive and even inspirational decade or two. It has a lot of answers to all sorts of 'why?' questions. The development of better statistical techniques and improved collection of data, not to mention the more widespread use of experiments, means economists have gained powerful insights into human behaviour. Most of the examples earlier in this book have involved microeconomic analysis.

Economists know they can really offer a lot of insight on questions like these. Typical articles in the leading professional journals will look at issues like why businesses in one industry but not others will use a certain kind of exclusive contract with their suppliers, whether welfare payments work best in cash or as vouchers, what effect growing up in a public housing project has on earnings potential, whether maternal education cuts high birth rates in poor countries and if so how much, what kind of personality traits help people get jobs, what kind of interconnection charges in the telecommunications industry encourage use of the Internet, and so on.

Similarly, the government's most useful policy tools are all concerned with microeconomics, or the supply side as it's often called in this context (as opposed to the demand side which is what traditional macroeconomic policies try to influence). Supply-side economics got a bad reputation in some quarters because it was warmly embraced by President Reagan and Mrs Thatcher and therefore seen as a veil for favouring big business and the rich. But two decades on, now the political heat has died down, it is clear supply side issues are very important for the health of the economy, and are intimately bound up with government actions. Is the degree of regulation of a particular industry tough enough, but not too tough? Is it easy, but not too easy, to set up a new business? Is the banking system secure and well-capitalized? Can damaging monopolies be forced to allow competition into their markets? Are certain tax rates so high they damage investment?

There are answers to many such questions, putting a figure on the size of the effects with fairly modest margins of uncertainty. And there are of course many more questions left to address, not least because the world keeps changing. The research agenda is incredibly rich and exciting.

Earlier scholars' focus on the traditional big themes of macroeconomics had a limited payoff in terms of our understanding of human economic behaviour. On the other hand the payoff in applied microeconomics, applying the tools of economic analysis to all sorts of subjects outside the traditional boundaries of the profession, has been enormous. The research areas of a list of rising stars, mainly microeconomists, named in 1998 by *The Economist* magazine ranged from the transmission of Aids to voting behaviour, or the costs of the existence of urban ghettos to the impact of police numbers on crime rates. As the influence of economic analysis on other areas such as sociology and criminology spreads, it could really have a tremendously beneficial impact on public policy. Using economics to work out how to achieve better results is sometimes called 'evidence-based policy' (which doesn't actually give one huge confidence in the past advice of sociologists, criminologists, political scientists etc. What did they do before – gut instinct-based policy? Wild guess-based policy?)

Some of the most interesting areas of economics now concern the overlaps with other social sciences. This inter-disciplinary work has shed real light on phenomena such as inequality, educational outcomes, welfare and so on. As Matthew Rabin, a pioneer at the frontier between economics and psychology, points out, conventional economics does involve a psychological

assumption, that of self-interested 100% rationality. But sometimes alternatives are appropriate, and that allows the powerful tools of economics to be applied to other sorts of problems. For example, addiction, procrastination or risky behaviour by adolescents have all lain outside the scope of economics before, but no longer. According to Rabin: “There was a distant past when psychology and economics were more connected, when all of social science was one, but things have gotten more specialized. So we're not addressing something that no researcher has addressed before. We're just bringing these things back together.”

Much of this has been made possible by advances in the use of econometrics in microeconomic studies. The 2000 Nobel prizewinners, Daniel McFadden and James Heckman, won the award in recognition of the pathbreaking work they had done in applying statistical techniques to the behaviour of individuals facing choices between alternatives about how much to spend or save, how hard to work, what to buy, how to travel to work, which job to train for, and all those other myriad everyday decision.

Two developments have made modern microeconometrics possible. One was the increasing amount of survey data from the 1960s on, resulting in some very large sets of information about thousands and thousands of particular people's characteristics and choices. The other was the steady improvement in computer power and decline in its cost, making it feasible to analyse all this information.

Much economic theory is built on the idea of the ‘representative agent’, a typical person with fixed preferences who would seek to maximize their ‘utility’ with the choices they made. The economy was then the sum of all these identikit robots. Thus it is that introductory economics courses generate their first wave of drop-outs. In the 1960s, however, McFadden drew on psychological research on how people choose to introduce a model where there are specific probabilities that people will choose between the various options open to them, and it then becomes possible to set out how consumer demand – for a certain type of transport, say – will depend on a given set of choices. This kind of set-up is now called the ‘multinomial logit model’. One of its first big uses in practice was in the development of the Bay Area Rapid Transit in San Francisco. But although developed with reference to transportation choices, the model has a huge variety of applications and has become one of the most successful workhorses of applied economics.

One of the assumptions of the model, however, is that preferences between two choices stay the same whatever other choices are available – the so-called ‘independence of irrelevant alternatives’. This says, for example, that I am twice as likely to choose black shoes as red shoes when the other options are pink and beige, and also when the others are navy and beige, when in fact in real life I might well prefer navy to black. So the workhorse model has since been extended to accommodate this, and also to reflect the fact that preferences can change over time. Introducing time also means incorporating people’s expectations about how their available choices will change in future.

A more fundamental issue turns on the inconsistency between the basic economic assumption that people have a given set of preferences, formed implicitly by their genes and upbringing, and the psychologists’ view that instead people have attitudes that often change and depend on context, to the extent that it makes no sense to imagine anybody has a set of underlying preferences. In that case the economists’ procedure of modelling individuals’ behaviour as making the self-interested choices that will best satisfy their preferences is deeply flawed.

McFadden’s response draws on an analogy with vision. We know from the existence of optical illusions that we often misperceive the way things ‘really’ are, but precisely because we know that we can adjust for it. Systematic illusions only rarely affect behaviour such that we do things operating against our self-interest time and time again. On the whole, he argues, further refinements of the standard economic approach will provide the best means of predicting behaviour and assessing alternative policies. The impressive catalogue of results from modern applied microeconomics backs up this claim. Besides, we have bumped up to the limits for now of what is computationally cheap and easy.

Fascinating developments in the laboratory, however, do confirm that sometimes people make decisions that do deviate systematically from the standard economic model. For example, experiments asking for answers to a question show that people’s responses are heavily conditioned by any clues they are given in the question. An influential experiment carried out by psychologists Amos Tversky and Daniel Kahneman involved asking the subjects to say what proportion of African countries are in the United Nations, or similar non-obvious questions whose answers lay between one and 100. But they were asked after the spin of a ‘wheel of fortune’ which would randomly stop at a number between one and 100. The answers were always heavily influenced by the random number. If the wheel stopped at 10, the median answer

was 25, and if it stopped at 65, the answer was 45. This phenomenon, known as anchoring, occurred even though the respondents knew the wheel was random, and even though the questions were meant to be emotionally neutral. There are now many other examples of how anchoring affects economic choices.

Robert Shiller has shown how anchoring affects financial markets. In his best-selling book *Irrational Exuberance*, he describes how it works in the case of share prices. Possible anchors are remembered past prices, nearby ‘psychological’ milestones like 10,000 on the Dow Jones Industrials index, past percentage falls if there is a stockmarket crash, the price-earnings ratio of other companies in the same industry, and so on. Thus the share prices of companies based in the same country behave more alike than the share prices of companies in the same industry, even though you would expect the fundamentals of demand for the product to have more influence on the value of the company than the location of its headquarters.

Similarly, people place too much emphasis on immediate context in other ways. We are heavily influenced by recent questions, or by events in the immediate past. We put far too much weight on pure coincidences. This is the appeal of the Kevin Bacon website, which plays on the ‘small world’ phenomenon that very few links separate people in a network – the famous ‘six degrees of separation’ except that six is an over-estimate in our connected times. Nobody can believe the number of links is so small and also so meaningless.

We all think we know more than we do. Over-confidence is another well-documented psychological phenomenon. Experiments asking factual questions which also ask people how confident they are about their answers have found that when people say they’re certain, in fact they are only right about 80% of the time.

Robert Shiller has found from surveys he has carried out that investors are astonishingly confident. In a survey he conducted straight after the 19 October 1987 stockmarket crash, he asked: “Did you think at any point on 19 October that you had a pretty good idea of when a rebound was going to occur?” Nearly half of those who carried out trades on the day said they’d thought they knew what the market was going to do.

The overlap between psychology and economics is sure to be a fruitful and exciting area of research; it’s unfinished business. A lot of the stylised facts uncovered in psychology have not

yet been incorporated into economic theory, but thanks to the findings of behavioural and experimental economists this is starting to happen. Past greats like Irving Fisher and John Maynard Keynes placed a strong emphasis on the importance of psychological factors in explaining economic behaviour. So in a sense this will mark a welcome return to an older tradition in economics, a true marriage of ‘social’ with ‘science’.

In practice, as in theory, the transfusion of techniques along with ideas from other disciplines has started rejuvenating economics, making it one of the most exciting subjects you can possibly study.

Conclusions

It has to be admitted that not all attacks on economic theory are completely ill-founded. Any kind of theory involves simplifications, or it’s a description, not a theory. Setting out these simplifications as a formal set of equations can act as a powerful analytical tool. But being able to write down a set of equations isn’t the purpose of trying to analyse the economy. On the contrary, the point is understanding the world we live in.

In one of his letters the early 20th century economist and mathematician Alfred Marshall wrote:

“I have had a growing feeling that a mathematical theorem dealing with economic hypotheses is very unlikely to be good economics, and I go more and more on the rules: (1) Use mathematics as a shorthand language rather than as an engine of enquiry. (2) Keep to them until you have done. (3) Translate into English. (4) Then illustrate by examples that are important in real life. (5) Burn the mathematics. (6) If you can’t succeed in (4), burn (3). This last I do often.”³

For while writing down a formal model is a crucial professional tool, enforcing logical consistency, accounting truths and also bringing real insights, perhaps counter-intuitive, that might be harder to reach with words alone, in truth a lot of economists rely too much on the

³Marshall is one of the all-time greats who did most to make economics very mathematical and technical, for example in the use of differential calculus to represent decisions ‘at the margin’. Yet as this quotation shows, he was well aware of the limitations of this approach. He also wrote extensively about phenomena that thrill complexity theorists, like increasing returns.

formalities. They need to publish academic papers for their professional advancement. Perhaps they are not too sure themselves about the practical implications of their research.

As Paul Krugman has put it: “Much of the criticism of formalism in economics is an attack on a straw man: the reality of what good economists do is a lot less formalistic than the popular image. Bad economists, of course, do bad economics; but one should not confuse a complaint about quality with a complaint about methodology.”

Equally, at a minimum, we ought to do better as a profession in explaining to the widest possible audience what it all means in the real world. You can't blame the good economists for all the bad economics that gets done in universities. But perhaps there are too many bad economists allowed, because they're needed as fodder for the higher education machine, to get away with spuriously mathematical research that doesn't really amount to very much. There are certainly too few good economists engaged in outreach to the general public or business audience, despite the huge relevance of economics to public policy and private decisions.

The only possible conclusion is for me to encourage readers to go and do good economics. Oh, and enjoy it.

Ten rules of economic thinking

1. Everything has a cost

Or as it's often put in the economics business, 'There's no such thing as a free lunch'. This means more than the obvious statement that very often acquiring something will involve handing over money. Even activities that appear to be free will also have a cost, often called the opportunity cost.

We all take decisions weighing up various opportunity costs all the time. If I buy a new pair of boots this month I won't be able to spend as much on other things. If I watch TV all evening I won't write another chapter in my new novel. Most of us have limited financial resources and all of us a fixed amount of time.

The same constraints apply across the board, to all human decisions. Whether it's a university deciding which departments to hire new professors in, a company planning its next year's budget or a government weighing up signing a new treaty or building a road, making one decision rules out the alternatives.

2. Things always change

This is another way of saying that economies are made up of millions of people who, peskily, react to the environment in which they find themselves. Human initiative is bad news for policymakers because it means a policy drawn up on the basis that people behave in a certain way can be undermined if they change the way they behave in response to the policy.

Much economic theory is based on the so-called 'ceteris paribus' assumption, that all other things will remain unchanged apart from whatever the specific thing is that you're trying to analyse. The assumption is necessary because without isolating certain aspects of a problem it can't be analysed at all. But it's essential at the end of the process to think about what will change in practice and whether that sheds any new light on the analysis.

The deeper moral is that economic policy is not a matter of exercising control over anything at all. For much of the post-war era policy was based on the idea that the economy was

a machine about whose cogs and mechanisms we could steadily gain greater expertise, complicated but stable and predictable. No such luck.

3. Metaphorical ‘time bombs’ don’t explode

This follows from (2). Time bombs are all based on false *ceteris paribus* assumptions, when in fact unsustainable trends always lead to changes in people’s behaviour precisely because they are unsustainable.

Environmentalists are particularly keen on time bombs, which is why economists so often seem to be anti-green. One example is the so-called ‘population time bomb’. In 1968 environmentalist Paul Ehrlich wrote a best-seller with this title, predicting that over-population meant hundreds of millions of people would die of starvation during the 1970s, including many millions in the developed world. Not only did it not happen, but average calorific intake has increased by more than 50% since 1961, food prices have fallen steadily in real terms and the proportion of people who are starving has fallen dramatically to about 18% of those living in the developing world. Where did Dr Ehrlich go wrong? Birth rates decline as people become richer, and the world population is now expected to stabilize at about 11 billion in 2100. In addition, improvements in agricultural technology like the ‘green revolution’ of the 1970s mean we are now more productive at feeding people. The main cause of starvation is not lack of food but lack of democracy, as it is in war-torn dictatorships that famines occur.

4. Prices make the best incentives

Changes in prices are usually what defuses time bombs – and much else besides. People respond to prices. Everybody loves a bargain, and somebody always responds to a great profit opportunity. On the other hand, many people don’t like to do something – or not do it – just because somebody in authority says so.

Government regulations are essential in any economy. Market economies only work well if they are based on solid institutions, the rule of law, the control of monopoly power, the adequate provision of public goods and so on. The question is really how governments can best achieve all these desirable conditions. Often, it is just by issuing instructions. The law is the law.

Often, however, price incentives can achieve the desired aims far better than any direct controls. Whereas people will try to get around regulations, they will respond to prices, and in

ways that reflect their own needs and preferences so the outcome is likely to be one that makes as many people as content as possible.

Critics often say the use of prices to limit demand is unfair because people cannot afford to pay equally well; but the real unfairness is the inequality of incomes, and that's a different question altogether.

5. Supply and demand work

If you restrict the supply of some item, its price will go up at a given level of demand, whether it's Ecstasy or the construction of new housing in central London or Manhattan. If demand for something increases at a given level of supply, the price will go up. The example that leaps to my mind are those particularly coveted shiny Pokemon cards, or indeed whatever happens to become the most popular toy at Christmas when the item was made and shipped to distributors six months before kids start thinking about what they want as presents.

Following on from the last point, if the price can't adjust upwards for some reason you will get shortages and queues. This imposes other costs like time lost hunting around or waiting and general irritation on buyers. They pay one way or another. If it can't adjust down sellers are left with unsold inventory, which imposes other costs such as storage and wasted investment on them.

In fact, supply and demand are as close as social science gets to laws of nature. To translate many public policy problems into supply and demand terms is illuminating. Just think about a highly regulated market like city centre housing, and the impact of rent controls. The effects of capping the price below the level the market would set are entirely predictable.

6. There's no easy profit

This is a much-mocked principle of economics. The mockery is summed up in an old joke about an economist and her friend spotting a \$10 bill lying on the sidewalk. The friend says they must pick up the money, but the economist says not to bother – if it were really there somebody would already have picked it up. Or in another, about how many economists it takes to change a lightbulb. The answer is none, because if the lightbulb needed changing, market forces would already have done it. (There are many variants of the lightbulb joke, naturally. Another is: only one economist, but the lightbulb really gets screwed.)

The economist's valid point, however, is that somebody always takes advantage of opportunities for profit, even if it does not happen as fast and seamlessly in life as it does in economic theory.

The principle of arbitrage applies in many contexts. It is the process by which entrepreneurs of one kind or another see the chance to make a profit, but will not make vast profits for long periods of time, because if they do they will be imitated. If a new office complex opens, the sandwich shop will soon follow. If there are more and more busy two-earner couples, other people will set up dog-walking and take-away food services. And as long as the pioneers are obviously profiting, competitors will follow suit. There are almost always advantages to being first, but in general any large 'excess' profits will be competed away over time.

It is obviously not the case that every activity is equally profitable, though. People who take bigger risks, whether financial speculators or business entrepreneurs, tend to earn higher rewards on average. If they didn't expect to do so, there'd be no point in taking the risk. They might as well opt for a quieter life.

7. People do what they want

All economic activities are equally desirable, or people wouldn't be doing them. There are caveats to this statement: it needs to add something like: 'at the current set of prices and given the constraints on technology and government rules and regulations.' Still, it's basically a way of saying that people adjust to do what will suit them best given the current state of the world – it sounds obvious when spelt out but seems hard for non-economists to grasp in many real-life contexts. There are countless examples of this principle.

House prices are higher in the zoning area of a good school, the house price premium reflecting the value people place on the better education. People choose between a cheaper home and weaker education for their children and a dearer home and better education. If the two sets of desires, based on different needs and preferences, were not in balance, the relative house prices would continue changing until they were.

Similarly, companies can choose to locate their factories in high wage countries where productivity is high or low wage countries where productivity is low. If they are lucky enough to find a low wage country where productivity is actually pretty high, they will be joined by lots of

other manufacturers building factories, and wages will get competed up. And a country where wages are kept higher than warranted by productivity levels, by vigorous unions, for example, will find its industry relocating elsewhere, slowly but surely. If the roads become very congested some people will switch to travelling by train or air, until the congestion levels recede enough that people stop switching. Increase road tolls, and some more people will switch. Put up train fares and people will become prepared to tolerate travelling on slightly more congested roads.

8. Always look up the evidence

Economists have an unfair reputation for playing fast and loose with the facts. (As yet another joke demonstrates. Question: What does two plus two equal? Economist: What do you want it to equal?) Certainly, lots of economic pundits who pitch up on TV or are quoted in the newspapers fling around a lot of factual claims. Some of these are highly dubious. But for anybody interested in good economics there are vast arrays of resources available on the Internet or in conventional publications.

Of course, some sources are a lot more reliable than others. Official sources go out of their way to ensure accuracy because it is so important to them to preserve their reputation. The Federal Reserve, Bureau of Labour Statistics, Office of Census, and equivalents overseas such as the UK's National Statistics or the Bank of England, France's Insee or the EU's Eurostat or European Central Bank post vast amounts of data online, along with press releases explaining the main findings. International agencies like the International Monetary Fund, World Bank and World Trade Organisation also do so. Whether or not you trust their policies, they too can't afford to publish incorrect factual information.

A huge number of other websites offer either data links or publish data, and like anything else online you have to form a judgement about the quality of the information provided. This book ends with a list of websites I have found most useful. The blue chip business press, publications like the Economist, Financial Times, Wall Street Journal and Business Week, also offer pretty reliable information. Again, even if you don't like their attitude, for the sake of their credibility the statistics have to be accurate.

However, you need more than raw data. Sometimes you have to think about it too. The basic question is: can that statement be true? What kind of evidence would you need to prove or

disprove it? What else would it imply – is it logical, plausible and is there any evidence on that too?

9. Where common sense and economics conflict, common sense is wrong

Take the two most frequent examples. Contrary to many people's natural belief, imports are better than exports; and there's no fixed number of jobs to go around.

On jobs, we've already met the 'lump of labour fallacy', but it bears repeating. There were only 13 million people working in Britain in 1870 compared with 27 million in 2000. That's a doubling in the number of jobs in 130 years. Yes, sometimes unemployment has been high, when people who wanted to work couldn't find jobs. But in general as economies grow so do both employment and real earnings. Workers become more productive, so they grow more prosperous, and there are more of them too.

10. Economics is about happiness

Economic welfare is improved by being able to buy more and better goods and services with the same amount of work, or preferably less. And that is just what has happened over the decades. Living standards have risen to an extent our grandparents or great grandparents would have found hard to believe, and average hours worked have declined (except for some Americans in the past decade or so – and that won't last.)

Economic research into happiness has found that at a given time rich people are happier than poor people, although the level of happiness has not trended upwards as strongly as average incomes over time despite the corresponding gains in health and longevity. The biggest gains in happiness seem to come with economic growth from a low level of income, meaning people living in poor countries still have a lot of scope for growing happier as their economies grow.

In the rich countries, those who don't have a job are definitely unhappy, although that could be because unemployment goes with low income as well as loss of status and social connection. In other words, it might well be poverty rather than idleness that is the source of their unhappiness.

Winning the lottery makes people very happy indeed, but only for a year or two before the effect wears off.

The basic point is that economic welfare is about consumption not production. Just as exporting is what a nation does in order to import, work is what the individual does in order to consume. Although everybody thinks work is the basis of capitalism, in fact, everybody having a good time and being comfortable is the key to a successful economy.

Why did anybody ever call it the dismal science?

Glossary

Chapter One

The **market** is where economic transactions take place, where some people **supply** goods or services to meet the **demand** for them by others. The quantity demanded and supplied depends on the price. A high price will induce more supply but less demand. So textbooks portray a market as a downward-sloping demand curve, on a graph with price on the vertical axis and quantity on the horizontal axis, and an upward sloping supply curve. Most markets do not have a single physical location, and few behave just like the textbook version. There are markets for all kinds of goods and services, and many situations that seem to have nothing to do with economics can be thought of as markets too – like family life or the earth’s atmosphere.

There are different types of elasticity, in demand and in supply, and in response to changes in price or changes in income. An **inelastic supply of labour** concerns supply and price; it means the amount of labour supplied – extra hours or workers – will not rise by much in response to an increase in the wage rate, or the price of labour.

A **monopolistically competitive** industry is one with lots of firms operating in it but yet not perfectly competitive because companies can create their own market niches by slight variations in what they are selling. This is **product differentiation**. It could take the form of slightly different technical specifications or design differences.

The **income-elasticity of demand** measures the proportionate increase in demand for a product when income rises. If it is more than one so that spending on the item rises more than in proportion to income (as with health care or designer clothes), it’s a **luxury good**; if less than one, a **necessity** (like food but also cigarettes). In other words, the technical use of these terms in economics is not quite the same as normal usage. (Cigarettes are actually now more likely to be **inferior goods**, demand for which actually falls as income rises, along with staple foods like maize as opposed to meat. If demand rises at all as income rises, it’s a **normal good** instead.)

Chapter Two

Competition refers to the number of suppliers. If they are numerous then not one of them is able to raise the price charged without losing all their customers. This is described as perfect competition. Imperfect competition is more normal in real life, and at the other extreme is monopoly, when there is only one supplier.

An **externality** occurs when there is a gap between the individual's private incentives and what would be best collectively or socially. There are many examples, one classic instance being pollution: it costs a company nothing to pour pollutants into the air or water, but there is a large cost to the local community. Similarly, drug use is not a private matter of comparing the health costs of taking drugs with the pleasure of doing so, but also involves the cost to the rest of society of anti-social behaviour, and greater health provision. Externalities are often treated in introductory texts as exceptions to the norm, but they comprise all the interest and controversy in economic policy.

The **price elasticity of demand** is a measure of how much demand would fall if the price rose, or vice versa. If a 1% increase in price causes a 1% fall in demand, the elasticity is one. If the fall in demand is proportionately bigger than the rise in price, demand is highly elastic; if smaller, demand is inelastic.

Cost-benefit analysis simply means comparing the full costs of any policy or course of action or decision with the full benefits. In practice, it's very difficult to do well – who bears the costs and who benefits? Over what time period? And how are they all to be measured?

Chapter Three

Risks are specific – unwelcome, known outcomes that will occur with a certain probability.

Uncertainty is general – the fog of obscurity that veils the future from the present.

Much social science assumes people's behaviour is based on **rational choice**, or making decisions that will be in their own best interests given their **preferences**, and the information available to them at the time. It seems more reasonable than assuming people make decisions that are against their own interests, but is nevertheless a controversial assumption with strong implications for people's behaviour that are not always borne out by the evidence.

Economics is built upon the foundation of **utility**, the benefit or well-being of individuals. It's closely linked to happiness. Economics wants people to be happy. People are assumed to **maximize expected utility**, the terminology for making the decisions that will give them the greatest probability of the highest level of utility possible, which is the way the assumption of rational choice is formulated in economics.

A decision is **time-inconsistent** when it is the best, or optimal, decision for now, but will not be the best with the benefit of hindsight.

People care more about departures of their income or share prices or any other indicator from a **reference level** than about absolute value.

The **status quo bias** or **endowment effect** refers to the higher value we put on something we already have compared to anything we only might be able to have.

Diminishing marginal sensitivity means the same absolute increase in money terms is less and less valuable at higher levels. So if I only have \$100, I value another \$11 much more than if I started out with \$1,000.

Chapter Four

The **labour market** is the market where people supply effort for wages and employers offer wages for work.

The **industrial structure** is a term for the pattern of what goods and services get made in an economy. What proportion of total national output is in manufacturing, such as electrical engineering or textiles, as opposed to services, such as software, finance, healthcare or aromatherapy services?

In **superstar** economics, some individuals are able to turn a small advantage in talent or productivity to a huge income advantage thanks to the existence of large economies of scale (see below) in the supply of their services. Sometimes known as **winner-takes-all**.

Economies of scale arise when the cost of supplying an extra unit of something, whether aircraft, a software programme or acting in a movie, declines the higher the quantity supplied. They can

arise because of high start-up or fixed costs, like the expense of designing and testing a new aircraft or making and marketing a movie, in a market with a large number of potential sales. Economies of scale are therefore very common but most people start out learning a textbook version of economics based on constant returns to scale as the math is much easier.

Productivity is the increase in output per extra unit of input. Labour productivity measures increased output per additional hour of work, capital productivity measures rise in output per additional unit of capital (such as machinery), and total factor productivity measures, yes, increase in output per extra unit of all inputs. Actually measuring these abstractions, especially 'capital' is, needless to say, fraught with difficulty.

The **Coase Theorem** says the identity of the owner of a given property makes no difference to the allocation of resources in the economy because any owner will seek the most profitable use.

Externality (see above)

Chapter Five

Industrial Structure (see above)

Market concentration is a measure of how few companies dominate sales of a particular product or service, or in other words how uncompetitive the market is. If the two biggest companies account for 80% of sales the market is highly concentrated, whereas if you have to count the two hundred biggest companies before you get to the 80% mark, the market is very competitive.

Scale effect is another term for the presence of big economies of scale.

Superstar economics: see above.

Marginal cost is the incremental cost of producing one more unit of output. **Average cost** is the average cost of producing all the units of output so far. They differ depending on the size of any initial fixed costs such as installing equipment or research and design, and on any other economies (or diseconomies) of scale.

Economies of Scale (see above)

Monopoly power is a description of a leading company's ability to dictate prices in the market because of the absence of effective competition.

Price discrimination means charging different prices to different categories of consumers in order to make a higher profit. It's a widespread practice – think of the different classes of air tickets, discounts for students, money-off coupons to attract customers not willing to pay full price who can be bothered to clip the coupons, or higher prices to see the cinema in the evening. Price discrimination can occur in any less than perfectly competitive market: if there were an infinite potential supply of trans-Atlantic flights, no airline would be able to charge businessmen a \$2000 premium for a little more space around their seat.

Technological innovation is the lifeblood of modern economies, the constant flow of new products and services, based on scientific discoveries and their practical application. The human appetite for innovations seems nowhere near its limits.

A company's **business strategy** is its basic outline plan for making profits. Is it going to grow by cutting prices in a bid for greater market share? By seeking new export markets? Does it care more about increasing the profit margin per sale rather than increasing the quantity of sales? Fewer businesses actually have strategies than you might expect.

Chapter Six

Supply, demand and **productivity** are very familiar by now. **Consumer tastes** means just that, the tastes instilled by familiarity and culture: French consumers prefer wine to root beer, Chinese consumers don't have a taste for dairy products, and young consumers everywhere in the world like Harry Potter.

Comparative advantage is the term for one country being *relatively* more efficient at producing something even if in absolute terms it is less efficient. It is measured by looking at the relative costs of two activities. Whichever country has the lowest cost ratio of X to Y has the comparative advantage in producing and exporting Y even if its cost is higher in absolute terms than in its trading partner.

Chapter Seven

Natural monopolies occur in markets that seem cut out for just one supplier, so great are the economies of scale. The power grid is one example. But in reality natural monopolies are rare. The grid can be regulated so that many suppliers sell electricity to it.

Economies of Scale (see above)

Market failure is a term for the presence of serious externalities. The normal mechanism of price adjusting to match supply and demand does not produce the best outcome.

Network externalities are externalities arising from the fact that the utility of a product or services increases the more other people use it too – like faxes or telephones or the Windows operating system.

A **non-rival** good is one whose consumption by me doesn't stop you consuming it too, like the public park or a good idea or a beautiful poem.

Zero marginal cost is when the production of an extra unit of output incurs no extra cost – like a software program, with high development costs but (almost) zero copying and distribution costs.

Non-excludability in consumption occurs when it is not possible to prevent additional users from consuming the product or service. Once the road outside your house is built, anybody can drive along it. Once a piece of code has been published it's next to impossible to prevent anybody using it.

Public or social goods are often both non-excludable and non-rival – national defence is a good example.

Peak and off-peak pricing offer a way of dealing with congestion: charge more at times when over-crowding is most likely. Useful in transport, energy, cinemas and bars – happy hour is off-peak pricing.

In the post-war years public **ownership** was seen as the best way of dealing with many types of externalities, and governments in many countries **nationalized** chunks of their economies. Since the early 1980s the balance has tilted away from public ownership because the absence of the

profit motive created much inefficiency. Many governments have subsequently **privatised** a lot of what they owned; but those externalities make government **regulation** of those industries in the general public interest unavoidable. The debate, which will doubtless continue to ebb and flow, is not about whether governments have to be involved in the economy, but how best they can do it.

Path dependency means that where we are depends on how we got here. It's jargon for saying that history matters in explaining current circumstances. Often used to describe technological features like the 'QWERTY' keyboard layout, first devised to minimize the chance of typewriter keys sticking together but still used on computer keyboards.

Chapter Eight

Environmental externalities are those which mean private economic decisions take too little account of the costs they can impose on the environment. These are known as **external costs** because you pay to clean up my pollution.

Market failure see above.

The **tragedy of the commons** describes the depletion of resources held in common ownership because nobody has the (private) incentive to guard them even though that would be in society's best interests. Why is cod running out but farmed salmon not? Why are cows in no danger of extinction whereas tigers are?

Perfectly elastic supply is such that a small rise in price would trigger an infinite increase in supply. It's a limiting case, a horizontal line on the textbook diagram. At the other limit perfectly inelastic supply is a vertical line – no more would be supplied at any price.

Free-riding is what happens when some people are able to take advantage of things that other people have paid for, because consumption is non-excludable. The danger of free-riding is why taxes to pay for public goods are compulsory.

Social cost is an alternative term for total external costs.

Economic instruments are taxes, subsidies and tradable permits that bring private costs into line with social costs and therefore create the right incentives to bring about the best outcome.

Economists prefer economic instruments to alternatives such as bans, quotas and rules, believing people respond better to incentives than to authority.

Regressive taxes fall proportionately most heavily on people with low incomes. The opposite is **progressive taxes**. A sales tax is regressive and an income tax is progressive. On the other hand, once you start tailoring taxes in any way to individual characteristics, you alter people's incentives (for example, about how hard to work) and therefore create inefficiencies. So most governments opt for a mix of different types of taxation.

Opportunity cost is a fundamental concept. It is the value forgone from not having made alternative choices. Every decision has an opportunity cost as well as a direct cost.

Chapter Nine

An **economic rent** is the income resulting from ownership of a rare asset. Land is one example. Natural resources are another. Government regulations often create rents by limiting access to something of value. Licenses are needed for all kinds of activities such as drilling for oil or marketing a new drug, as well as using the radio spectrum.

A **beauty contest** is a polite way of describing a decision by officials or politicians about which candidate should be awarded a valuable scarce resource like a licence to drill for oil or to use radio spectrum. Experience has given us every reason to be cynical about the quality of decisions made in beauty contests.

An **auction** is a market mechanism for allocating such scarce resources, and likely to be more efficient, but not always easy to design well.

The **winner's curse** arises when the winner of an auction has only won by over-paying. Why did none of the other bidders put as high a value on the licence? It doesn't seem to be common in practice, though.

Chapter Ten

Tax incidence is a description of who it is that ultimately pays a tax, because it's not necessarily the people who appear to pay it. Companies can pass corporate taxes onto customers in higher prices. A tax on property sales will get passed straight on to buyers in a sellers' market.

Elasticity of supply and demand (see above)

In working out the value of something over a period of time, what's needed is the **present value**, which puts the future in terms of the present by **discounting**, or reducing according to a rate of interest, future sums. The reason is that mostly we prefer money now to money in future – we are impatient, or to put it in economesese, we have a **positive rate of time preference**. If we have it now we can buy more goods and services right away and enjoy consuming them. This is why banks have to pay interest when we deposit money.

Collusive describes companies that conspire together to boost their profits at consumers' expense. The companies simply agree not to compete.

An **oligopoly** is an industry with just a few big companies whereas a **monopoly** has one, a **duopoly** has two, and then economists stop counting.

As described above, tobacco is an **inferior good** – people smoke less as their incomes rise. Taxes on cigarettes are therefore highly **regressive**.

Chapter Eleven

Game theory is the branch of economics that portrays (or 'models') behaviour as the outcome of the kinds of strategies that are used in games like poker or blackjack. There are several possible outcomes which occur with different probabilities and have different payouts. Game theory is incredibly useful for thinking about things like companies' behaviour in different kinds of markets, or arms build-ups, or any types of decision over time involving strategies. The standard example is the **prisoner's dilemma**: two prisoners are held apart and each offered a deal of a lesser punishment if they spill the beans on the other. If both stay silent they get a short jail term for obstructing the law; if only one accepts the deal he goes free and the other goes to jail; if both tell on the other, though, they both go to jail for the full term. What's the best strategy? In many situations in game theory there will be both a cooperative and a non-cooperative solution. Game theory sets out the prisoners' choices: either cooperate so that both would pay a little bit (jail

time) but both would benefit (a shorter jail term) in the long-run; or take a risk on each other's behaviour by not co-operating, and get either no jail or a long sentence.

This chapter offers a good chance to test yourself on these concepts already introduced in earlier chapters: **public good; fixed cost; economies of scale; free riding; opportunity cost.**

Chapter Twelve

More revision: **externalities** and **economies of scale.**

Diminishing returns to scale is the textbook situation whereby additional units of output cost more and more, not less and less. The classic example is agriculture, where farmers have to bring more and more land of decreasing quality under cultivation or spend more on fertilisers to boost output.

Special interest groups are organized groups which lobby government for policies that will help their members, but not consumers, workers or business as a whole. Examples include unions, industry associations, farmers' groups and associations for retired persons. Arguments made by such groups about the economy are not likely to be unbiased.

Chapter Thirteen

The concept of **network externalities** came up in chapter six: they create economies of scale in demand because more users means greater benefits to other users.

Goods which are **substitutes** suffer at each other's expense – if I buy more of one I cut back on the other. Vodka and gin for example. The relevant measure is the **cross-price elasticity of demand**, the measure of how demand changes in response to a rise in the price of another good. For substitutes, if the price of gin goes up I'll buy more vodka instead. **Complements**, on the other hand, are goods for which demand goes hand in hand, like gin and tonic. If the price of gin goes up I'll buy less tonic as well as less gin.

Lock-in is a term referring to the setting of technical standards which are extremely difficult to overturn, like those for mobile telephones or computer operating systems. Lock-in gives some producers a huge advantage, as with Microsoft and Windows.

The **first mover advantage** is the gain from being first in a market and thereby setting standards, reaping economies of scale ahead of competitors, establishing a formidable reputation and so on.

Natural monopolies were described earlier. But if a demonstration of how few are genuinely 'natural' is needed, consider the fact that the mail used to be considered a natural monopoly, in the days before FedEx and UPS and all the other couriers.

Chapter Fourteen

Many of the terms in this chapter have already been introduced: **discounting; first mover advantage; fixed costs and marginal costs; supply-side increasing returns to scale; demand-side economies of scale**, otherwise known as **network externalities; price discrimination**.

Sunk costs is another term for fixed costs which can't be recovered. Once you've built the Channel Tunnel, that's it.

Experience goods are those like books and magazines you need to try out before knowing whether you want to buy it. This is why bookstores now encourage people to browse by putting armchairs in cosy spots.

Reputation is so valuable that companies can incorporate a measure of it in their published balance sheets – accountants call it 'goodwill' and it is closely related to brand value. Some dot.coms had no assets apart from reputation, which is why they could suddenly become worthless when customers and investors revised their views about reputation.

We all know about the **information overload**: more and more information and the same amount of time in which to make sense of it.

Customizing is tailoring a product to each specific customer. Long done on expensive cars, introduced by Dell for PCs and Nike for online running shoes, still waiting for it for most mass market products.

Entry barriers are any kinds of obstacles that make it hard for new companies to operate in any market. Barriers range from high start-up costs (making aircraft or cars, say) to government regulations (in banking or pharmaceuticals for example) that are onerous for a newcomer to meet.

Chapter Fifteen

The **business cycle** is the term for the expansions and slowdowns or recessions that characterize all economies. These cycles are not regular – expansions are generally long, and recessions short – but they last roughly 7-12 years from peak to peak or trough to trough.

There is no technical definition of a **recession**, but it's usually thought of as either two successive quarters of declining GDP; or a year-on-year fall in GDP; or a general decline or slowdown in a wide range of economic indicators such as industrial output and employment.

Creative destruction is the term introduced by Joseph Schumpeter for the turbulent process whereby a capitalist economy expands, with businesses starting up and failing, jobs created and destroyed, new technologies sweeping away old.

Chapter Sixteen

Most discussion of **public goods** concerns national economies and governments. A **global public good**, on the other hand, is a concept that applies on a wider than national scale, as its name implies. There have always been some global public goods – international telecommunications standards and inter-operability agreements, for example, and globalisation has made the idea more relevant today.

Intellectual property rights are legal rights of ownership granted to creators of ideas or bits of knowledge, such as book copyright or patents on new medicines or the specific design for a watch or industrial part. Users must pay a fee, a kind of rent for the use of the property, to the owner of the intellectual property right. The idea is controversial, though, with some thinkers arguing the concept of a property right is inappropriate for non-tangible ideas as opposed to tangible land or resources.

Chapter Seventeen

Foreign direct investment is investment by a company from one country in another country. It can occur either by taking over an existing business in the host country or building a new

business from scratch. Other kinds of cross-border investment, such as portfolio investments, are financial: buying bonds or shares issued by companies in other countries, or bank lending across borders.

Chapter Eighteen

Supply of Labour (see above)

The **lump of labour fallacy** assumes there is a fixed number of jobs to go around, and forgets that the labour market is a market in which demand as well as supply can vary. It crops up in many contexts – immigrants ‘stealing’ jobs, technology ‘destroying’ jobs, a cut in the legal limit of working hours ‘creating’ jobs.

The **assimilation hypothesis** says new groups of immigrants start out earning less than other workers in similar jobs, but later catch up or even overtake.

Congestion costs, remember, are a kind of externality in the (over-)use of public goods.

And **cost-benefit analysis** is the systematic comparison of all relevant costs with all relevant benefits.

The **capital intensity** of the economy (or a firm) is the ratio of capital to labour (and other resources) used in producing output. Within the labour force of the firm or economy the **skill mix** is, exactly as it sounds, the palette of different skills and levels of experience available; it is a kind of **human capital intensity**, human capital being the economist’s term for the abilities a human being has invested in acquiring over the years.

Chapter Nineteen

Diminishing returns we have met before (see above).

Technical progress is the increase in total factor productivity (that is, increases in output not attributable to increases in any of the inputs or factors of production) over time due to improvements in technology.

The **demographic transition** occurs when an economy has reached a modest level of prosperity, and death rates fall while birth rates decline even faster. This brings population growth down from the 2% a year typical of very poor countries, and the average age of the population starts to rise - from the mid-teens typical of poor countries to the mid- or late-40s in the rich countries .

The **demographic timebomb** refers to the fact that a population in the rich nations is stable or declining and average age rising fast – who is going to do the work and pay the taxes to support all those pensioners in the future?

The **dependency ratio** measures the number of dependants below and above working age as a ratio to the working age population.

Chapter twenty

The **financing gap** refers to the gap between what a country would need to invest to hit a target growth rate and the level of national savings.

Human capital is the set of skills, know-how, experience, educational attainment and talents embodied in humans.

Conditionality is the term for the conditions attached to loans and grants by the International Monetary Fund, World Bank and other official lenders. Often criticized as onerous and intrusive, but hardly ever fully applied in practice.

Debt relief means writing off past debts because they are never going to be repaid in full. What matters is how much the write-off cuts interest payments that have to be made, as these are coming out of tax revenues that could be spent on education or health – or indeed arms and presidential palaces.

Social capital is a term even fuzzier than ‘capital’ and ‘human capital’, shorthand for the institutions, habits, values and traditions that characterize any society and might contribute favourably to economic growth. The definition and measurement of social capital are a subject of hot debate. But it is a useful concept because societies do differ so much in their economic capabilities, even if they have similar resources and similar degrees of physical and human capital.

Chapter Twenty-one

Deflation refers to consistent declines over time in the general level of prices in an economy – not just some prices, and not just a steady reduction in the rate of inflation, which is a **disinflation** rather than a deflation.

Demand management is the process whereby governments or central banks try to adjust the aggregate level of demand in the economy, to smooth out the ups and downs of the business cycle or to boost growth.

Fine-tuning is demand management so excellent that it succeeds in eliminating business-cycle fluctuations. Often attempted, at least in the past, and never achieved.

Rational expectations says that what people expect to be true about the future is (by and large) correct, in the sense that their expectations about the economy will reflect the actual behaviour of the economy. Taken too literally, this is obviously silly, but it captures the insight that people are not likely to get things systematically wrong. If the government is running policies that will lead to high inflation, people will tend to expect high inflation.

The **liquidity trap** is what happens when interest rates can fall no lower because they are already close to zero but that's still not low enough to stimulate demand. A reduction in interest rates should persuade people to spend more rather than hold on to cash and bank deposits, but in the trap they prefer this 'liquidity'. The reason may be that if there is deflation, the real interest rate is higher than the nominal interest rate. The nominal rate is what your bank says it pays you on your deposit; the real rate is this nominal rate adjusted for what you expect inflation to be. If inflation is negative, the real return to holding on to your deposit is higher: goods will cost less if you buy them next year rather than now.

Governments can **crowd out** private investment by borrowing in the financial markets. The government borrowing drives up the interest rate all borrowers must pay, as they are competing for the same pool of savings.

Stagflation is the combination of low or no growth and high inflation. It is both unpleasant and has no place in conventional economic theory. Best avoided.

Chapter Twenty-two

Inflation is the percentage increase in the price level, usually measured at an annual rate.

Hyperinflation is wildly excessive inflation, running at thousands or tens of thousands of percent a year. Inflation is bad enough; there is nothing more corrosive to a society than hyperinflation.

Demand management: see above.

Fiscal policy refers to decisions about government spending and taxation; **monetary policy** to decisions about interest rates, credit conditions and liquidity in the financial markets.

Aggregate supply is the economy's total supply capacity, and the missing link between demand management and inflation. Allow demand to expand without paying attention to the **supply side** of the economy, and the only result will be higher inflation.

The **Phillips Curve** links the unemployment rate with the rate of inflation. It slopes down: the higher the inflation rate (y axis) the lower the unemployment rate (x axis). But bitter experience has taught us that this is not a trade-off governments can manipulate according to preference, because if they boost demand and hence accept higher inflation in order to cut unemployment, the Phillips curve moves. It slopes down short-run but in the long run is vertical at the **non-accelerating inflation rate of unemployment** or **Nairu**. This is determined by supply-side conditions.

Inflation targetting is the outcome of this experience. Central banks now concentrate on keeping inflation low and steady at 2-3% a year. Sometimes they have an explicit inflation target, sometimes it is implied.

Deflation is negative inflation or falling price level.

Central banks have an easier task the higher their **credibility**. If people believe the central bank will always do what it takes to keep inflation low, the chances are they'll behave in ways that keep inflation low anyway, not making huge pay demands for example because they know that will drive interest rates higher.

A big debate in monetary policy is **discretion** versus **rules**. A rule like ‘always raise interest rates if the money supply grows faster than x%’ will help credibility but could be damaging in some circumstances – if, say, the excess growth is due to a technical change in the banking system rather than a change in economic behaviour. The modern consensus favours ‘constrained discretion’ which means rules for when it’s permissible to deviate from rules.

A **monetary target** is an alternative to an inflation target. They were popular in the late 1970s and early 80s, and took the form of target growth rates for the **money supply** i.e. cash plus different kinds of bank deposits. The rationale was that inflation could not occur if there was a limit on how fast the money to fuel spending became available.

An **exchange rate target** is the final kind of target for monetary policy, involving fixing the exchange rate with a major currency like the dollar. The rule is then in effect ‘have the same inflation rate as the United States’. It is a great way of reducing very high inflation rates but can be disastrous when (a) the wrong exchange rate is chosen and/or (b) other policies are inconsistent with stabilising inflation, for instance when the government budget deficit is huge so it has to borrow bucketloads to finance its spending.

Chapter Twenty-three

The **peace dividend**: the government and national resources freed by not having to spend massive amounts on armaments and defence.

Automatic stabilizers are tax and spending devices that offset the direction of the economy without requiring an explicit decision – such as unemployment benefits (so the government spends more when the economy is weak) or sales taxes (so the government takes less tax when the economy is weak).

Chapter Twenty-four

This one is about handling data, not concepts. Without well-based statistics, there’s no picture at all, never mind a big picture.

Chapter Twenty-five

Supply of Labour and Supply side (see above)

The **substitution effect** is the effect of a higher wage rate on the work-leisure choice: if you are paid more per hour you have an incentive to work more hours and consume less leisure. The **income effect** works the other way: if you have more money thanks to a higher wage rate you need to work fewer hours to cover your bills.

WEBSITES

International organisations

The World Bank

<http://www.worldbank.org>

The International Monetary Fund

<http://www.imf.org/>

The Organisation for Economic Co-operation and Development

<http://www.oecd.org>

UK Government sites

The Treasury

www.hm-treasury.gov.uk

The Bank of England

<http://www.bankofengland.co.uk/index.htm>

The Office for National Statistics

<http://www.statistics.gov.uk/>

US Government sites

Bureau of Economic Analysis

<http://www.bea.doc.gov/bea/pubs.htm>

Commerce Department

<http://home.doc.gov/>

including labour statistics for the US and other countries

<http://stats.bls.gov/datahome.htm>

Federal Reserve Board

<http://www.federalreserve.gov>

The Council of Economic Advisers

<http://www.whitehouse.gov/cea/>

Census Bureau

<http://www.census.gov/>

Economists' sites

Most academic economists maintain a website with their research papers, course material and popular writing. Good blogs/portals which gather the work of many economists are:

Economist's View

<http://economistsview.typepad.com/>

and

Vox EU

<http://www.voxeu.org>

Newspapers and other media

Amongst the obvious choices (although some of them charge for some content) are:

The Wall Street Journal

<http://www.wsj.com>

The Financial Times

<http://www.ft.com>

The Economist

<http://www.economist.com>

Reuters

<http://www.reuters.com>

Bloomberg

<http://www.bloomberg.com>

Chapter References

This is not an exhaustive bibliography. It includes books and articles that are accessible to readers who are not professional economists, and some websites that include such material as well as more technical stuff.

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'The Soulful Science' by Diane Coyle (Princeton University Press 2007) is my survey of recent new research in economics.

Chapter Three

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Chapter Nine

<http://www.paulklempere.org> has plentiful material on auctions, some very difficult, some not. See also the FCC's site for details on the US auctions, research papers and assessments.
<http://www.fcc.gov/>

Chapter Ten:

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Chapter Eleven,

'A Beautiful Mind', Sylvia Nasar's biography of John Nash, is an enjoyable book which illuminates the importance of game theory.

Chapter Sixteen

NBER Working Paper no. 7716 by Michael Kremer was the origin of the global fund for vaccines idea.

Chapter Seventeen

'Globalisation and its Discontents' by Francois Bourguignon and others, Centre for Economic Policy Research, May 2002 (<http://www.cepr.org.uk>), is a non-technical overview of the evidence on globalisation.

Chapter Twenty

William Easterly, 'The Elusive Quest for Growth' (MIT Press 2001) gives an accessible history and critique of many of the past fashions in development economics.

'Tropical Underdevelopment' by Jeffrey Sachs, 2000, available at

http://www2.cid.harvard.edu/cidpapers/tropics_eha-1.pdf

John Sutton, 2001 Royal Economic Society Lecture, <http://www.res.org.uk>

Chapter Twenty-one

On Japan, Argentina and other topical issues in macroeconomics, the best place to start is a website run by Nouriel Roubini, <http://www.stern.nyu.edu/globalmacro/> It has material ranging from newspaper articles through to technical working papers.

Chapter Twenty-two

Mervyn King, 'Monetary Stability: Rhyme or Reason?', 7th ESRC Annual Lecture, 1996.

Available from <http://www.bankofengland.co.uk>

Frederic Mishkin and Klaus Schmidt-Hebbel, 'One decade of inflation targetting in the world', National Bureau of Economic Research working paper, July 2001, <http://www.nber.org>

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Bob Woodward, 'The Agenda', (Simon & Schuster 1994) is an excellent account of the budget debates that took place when Bill Clinton became president in 1992.

Chapter Twenty-four

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In Praise of Economics

Bryan Caplan, 'Systematically Biased Beliefs About Economics', Economic Journal (112) April 2002, pp1-26.

Partha Dasgupta, Modern Economics and Its Critics, working paper posted at <http://www.econ.cam.ac.uk/faculty/dasgupta/>

Richard Freeman's course website, covering complexity theory, is at <http://www.courses.fas.harvard.edu/~ec1818/>

David Henderson, Innocence and Design: The Influence of Economic Ideas on Policy, Blackwell 1986.

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Paul Ormerod, Butterfly Economics, Faber & Faber 1998.

Robert Shiller, Irrational Exuberance, Princeton University Press 2000.