

Chapter 1

The Joy of Economics.

1: Introduction.

To me, economics has always been a fascinating subject. On one level, it deals with the economy and how it works, which is one of the central features of our lives today. On another level, it deals with how we make decisions, or at least should make decisions at the level of the individual, firm or society. These two themes will recur throughout this book in differing guises and are central to economics.

Whether we are looking at T.V., surfing the internet, eating or drinking, we are inescapably part of the world economic system, the *global economy*. There are very few if any activities that do not in some way involve the market nowadays. Even going for a walk in the countryside might involve us in using special walking shoes, clothing and transport to the countryside. In this we are different to our ancestors in the distant past: 12,000 years ago gatherer-hunters were largely self-sufficient communities who produced all they needed themselves¹. Even in western European rural communities in the middle ages, there was a much greater degree of self-sufficiency: many things were made within the household and those few goods and services that were exchanged on the market were largely local. At no time in human history has our global interdependence been so great.

The complexity of this system is beyond human comprehension despite being man made. The economic system links almost all of humanity and involves the decisions and actions of us all; it interacts with the eco-system and weather. The whale was almost hunted to extinction to supply the demands of consumers for its products (from ladies lingerie to lamp oil). Global warming is occurring as the production of greenhouse gasses increases with economic growth. Every day each one of us makes many economic decisions (what to buy, what to make, what to do at work, charities to donate to etc.) on the basis of our own preferences and information: the economy is the outcome of all of this myriad of inter-related individual decisions and actions.

2: Infinity in a pencil.

"To see a world in a grain of sand
And heaven in a wild flower
To hold infinity in the palm of your hand
And eternity in one hour."

William Blake...*Auguries of Innocence*.

There is a very real sense in which the economy represents an interconnected whole, in which every individual element is linked with the whole, the global economy. This integration and complexity can be considered if we take almost any commodity and look at what has gone into making it in terms of goods and services.

Let us take the example of if we look at the humble pencil²: this is an old technology that has been around for sometime, but which has so many inputs that have gone into its making that they would need a book to list even the main ingredients. And this is just a simple good, not a refrigerator or VCR. Let us ask the question: what inputs have gone into a pencil, either directly (they were used to make the pencil), or indirectly (they were used to make the things that make the pencil, or to make the things that were used to make things that were used to make the pencil and so on...).

First, let us take the factory that makes the pencils. A real-life pencil factory is a big building, employing many people with different machinery and different tasks. Let us simplify things a lot: at the simplest level, the pencil is made by combining wood, paint and lead (and possibly some metal alloy and rubber if it has an eraser at the end: to keep life simple, we will assume not). The pencil factory will buy these three ingredients from suppliers and combine them using a mixture of labour and machinery. Over the history of the pencil, the technology has changed. Today, this process might be almost entirely automated, possibly controlled by computer. The human labour input would be in terms of monitoring and maintaining the machinery, managing the firm and various other tasks (cleaning the floors,

carrying boxes etc.). In the past, there might have been a less integrated manufacturing process: one machine assembled the lead and wood, another painted it; different workers operated each machine.

We can then go back one level: who and what made the machines; who and what made the wood, lead and paint? What about the human labour: this also has inputs (the things it consumes)? What about the factory: the carpets, doors, building and furniture? To keep the story simple at the moment, let us concentrate on the physical inputs.

The wood comes through a process: trees are chopped down by loggers using axes and electronic saws, the logs are transported by lorry to a wood factory that process it into various forms for use (for example) by pencil manufacturer. This occurs in parts of the world where there are forests: let us say Norway for example. The wood product will then be taken from Norway to where the pencil is made: this might be a journey by rail, road or sea.

The lead³ for the pencil is mined: the mining process involves digging a mine with machinery and labour for ore. The lead ore is then smelted, possibly on a near by site or on a distant site (smelting involves heating up the ore which is energy intensive: in the days before widespread use of electricity, this needed to be done near an energy source, usually coal). The lead is then supplied to the pencil maker probably via intermediaries. The paint is nowadays created using advanced chemical processes in largely automated factories.

We have only talked in a very schematic way about how a pencil is made and told part of the story. I could go into more details at each stage, listing in more and more detail the processes involved and the human actions and physical inputs at each stage.

There are however a few general points I want to emphasise. At each stage, the production of almost any commodity involves some general elements: machine tools, human labour, computers, buildings, electricity, petrol, paper etc. Services are

not really an exception here; whilst the output is not physical, many of the inputs are (look at a restaurant or accountancy firm and you see plenty of physical inputs). Through these almost universal inputs, almost any good or service is linked to the world economy “at one step”. *In the economy, everything is interconnected. We can see the whole world economy in a pencil!*

3. How we understand the economy: the principles that guide economists.

If the economic system is so vast and so complex, perhaps it is beyond understanding?

Indeed, the physicist Max Plank is reputed to have looked into economics, but decided it was too complicated so he decided to study physics instead. Well, as it happens, I think that there are some general principles and insights that economists have developed that give us some understanding of how the market and economy work. The general principles which guide economists can be reduced to a list which includes the following 8 items. The list could of course be made much longer and more precise: however, it would be difficult to make it any shorter or more general.

1) the operation of *supply and demand* in competitive markets.

Lord Carlisle is reported to have said “*If you train a parrot to say supply and demand: there, you have an economist!*”. The sort of thing you learn in your first undergraduate lectures has proven pretty good as a way of understanding what happens in competitive markets: demand increases tend to raise prices, an increase in supply lowers prices, that sort of thing. Of course, some economists even apply this to non-competitive markets, which is wrong! For example, the notion that minimum wage laws will decrease employment is based on the notion that labour markets are competitive. However, there are strong reasons to believe that labour markets for the unskilled have strong monopsony elements: the employers set the wages. In a monopsony market a minimum wage can *increase* employment. Whilst supply and demand analysis is very useful, you need to think before you apply it: “*is this market really consistent with the assumptions of perfect competition*”?

2) **the response of agents within the economy to *incentives*.**

If you change the incentives you will alter behaviour. This is something that non-economists often have problems with. In everyday life we do not like to think that people are motivated by money: *mercenary* is a dirty word. Well, of course, whilst people do have other motives, the budget constraint and its slope is always there whether we like it or not! As the British prime Minister Sir Robert Walpole said: "Every man has his price"⁴.

3) **the *pursuit of profits and economic rents in imperfectly competitive markets*.**

Firms are not generally altruistic organisations: they are there to make money. They have done and will continue to do almost anything to make more money. There are many examples in business history of murder, the subversion of government, war and indeed almost anything if it enables them to make more money.

4) ***arbitrage: the tendency of arbitrage behaviour to equate returns across different activities and assets*.**

This is the basis of much of the theory of financial markets, from Forex to Wall street. But it also applies across a wider field of assets: whilst arbitrage may be weak sometimes, we can see its force in many markets.

5) **The effect of *imperfect information* on markets.**

The phenomena of adverse selection, signalling, rationing and limits on contractual agreements came to the fore in the 1970s, associated with the names such as Joe Stiglitz, George Akerlof and Michael Spence. The classic application was the market for Lemons. George Akerlof was able to explain the discount on second hand cars in terms of the private information car owners have. People with poor quality cars (Lemons) were more likely to want to sell them than the people with good cars. Spence highlighted the role of education as a signal of quality: even if education was irrelevant in terms of skills, a good educational performance could be a reliable guide to subsequent productivity.

6) **The concept of *opportunity cost*.**

Accountants are pretty powerful people: they play a key role in business organisations and the government. They look at the bottom line: how much cash does something make, how much does it cost, where's the profit? Accountants are not economists. The fact that things and activities have values other than their market/monetary values is something economists have long understood and developed ways of coming up with monetary values different from market values. Although the theory of value was developed to understand how markets work, it created a theory of value which can be applied almost anywhere and anytime, and is central to environmental economics, public economics and many other areas. The importance of opportunity cost is greatest when it diverges from the actual cost.

7) **The analysis of strategic behaviour, in particular the idea of the *Nash equilibrium*.**

Much of economic activity occurs in a *strategic environment*, where individual agents affect each others welfare and there are not many of them. This sort of context is central to *oligopoly theory*, and has a long history of analysis, from Antoine Augustin Cournot's analysis of mineral water duopoly in 1838 to Francis Edgeworth's analysis of price setting duopoly in 1897 (we will discuss this later in more detail later in the chapter *oligopoly theory made simple*). The more recent development of game theory generalised and developed these starting points into a general theory of strategic analysis that can be applied as much to how to run a war as corporate strategy. Indeed, as we shall see in *Donut world and the Duopoly Archipelago*, game theory has even come to play a central role in evolutionary biology!

8) **The *welfare properties of markets*.**

Adam Smith argued that there was something good about the market, who saw the market as guided by an invisible hand to bring about some form of common good. This idea became formalised in the *First Fundamental Theorem of Welfare Economics* which we discuss in more detail later. Under certain assumptions, a competitive market is Pareto optimal. This has some far reaching implications,

some of which we explore in both the macro context in the *mainly macro* part of the book, also in the micro context. Of course, the fundamental ideas of externalities and public goods also are useful in understanding many market failures we see. Even when markets are not competitive, the welfare properties of imperfectly competitive markets can be understood in terms of concepts such as consumer and producer surplus. Economics provides us with the tools for understanding the welfare properties of markets: this will be a central theme running throughout the book.

This list is not meant to be complete or exhaustive. However, it is interesting to note that most of these ideas were developed pretty early on in the history of economics (50-100 years ago), with the exception of the economics of information and game theory⁵. Furthermore, most of these ideas are dealt with in the first year economic principles course.

There have of course been many advances in economics in the last century. However, the advances do not often constitute completely new ideas: rather, they develop old ideas in new ways. The advances are often “technological” in nature: new mathematical or modelling technologies are applied in new settings. Econometrics has benefited from advances in computing. Also, the issues to be addressed have changed with the development of the economy. However, the underlying principles seem to remain the same.

These general principles and notions provide the economist with his or her basic framework for analysing a particular problem, issue or phenomenon: the economists “tool kit”. Different economists will apply them differently: there is much controversy in economics. It is to this issue that we can now turn our attention: the how and why of controversy in economics.

4. What do economists argue about?

Why do economists argue and what do they argue about? Clearly, this is a very big question and raises many issues that are general to any area of human understanding:

people disagree and argue about many things and indeed almost anything. However, in the case of economics I believe that there we can usefully oversimplify matters into three major levels or sources of disagreement:

- The extent to which economists adhere to the *laissez faire*⁶ view that the market gets things right (or as right as possible).
- The appropriate model that best describes the economy or market being analysed.
- The relative importance in practice of different factors within a model.

Of course, in any one debate, all three of these sources are often present and interact: for example, take the issue of anti-trust regulation. An economist who is relatively *laissez faire* in outlook will tend to think that the competitive model is most appropriate and that the market imperfections that do exist are not important in magnitude. However, it is useful to divide up these different levels at least at the conceptual level when we read a particular controversy.

4.1. World-views and Spectacles.

If you wear sunglasses, then the world becomes a darker place. Green-tinted glasses make the world look green. Economists have different perspectives or world-views that act like spectacles and shade how they look at any problem. There are traditionally two dominant views on policy: *Laissez-faire* and interventionist. I will outline a brief sketch (caricature) of these views.

Laissez-faire: the free-market works!

Economists wearing these spectacles tend to think of the economy as a (more or less) well functioning competitive free-market economy. The First Fundamental Theorem of Welfare Economics says that such an economy should be “efficient” in the technical sense of Pareto Optimality. According to this sort of economist, the free-market pretty much gets most things right and the role of government is really limited to ensuring that markets can operate freely and perhaps intervening where there are clear and major market failures (due for example to externalities or public goods).

Indeed, in the extreme free-market view government intervention or regulation of markets is seen as a last resort. Far from being the almost divine “social planner” that can intervene to rectify any problem (however slight) in the functioning of markets, the government is a very imperfect tool. It is itself subject to economic influences (lobbying), the need for re-election (in democracies), whilst regulatory bodies and bureaucracies are difficult to control. Indeed, government intervention in markets often has a lot of unintended side effects that may be counterproductive. It is the government that has the health warning, whilst the free-market is presumed innocent until proven guilty.

Interventionist: the free market works, but....

The second view has no generic label, but in the macroeconomic field it is certainly linked to the adjective “Keynesian”. Economists with these spectacles see markets as being inherently imperfect to some significant extent. The free market will often get things wrong if left to its own devices. There is some disagreement over whether the government can do much about it, but the question of regulation or some form of intervention is certainly on the menu as a possibility to be seriously thought about. However, the interventionist has a basic lack of trust about the free-market and believes that its outcome can be at best efficient but unjust and at worst both inefficient and unjust. Even perfectly functioning markets need not get the question of equity and the distribution of income right (it is Pareto optimal to divide a cake up so that one person has everything and the rest nothing). When there is market power or dominance, imperfect information and other imperfections, the free-market can yield highly undesirable outcomes. In this case, the efficient operation of the economy may require some sort of intervention to avoid these imperfect outcomes.

Of course, the extreme Laissez-faire view is held by few, although free-market ideologues are certainly an important political policy pressure group both sides of the Atlantic and around the world. Likewise, most interventionists would accept that there is no real alternative to the market to achieve the bulk of economic organisation in an economy.

Hence one can say that the real debate is really along a continuum: the question is one of extent. How much should the government intervene and how should this best be done? For example, Mankiw and Romer state in their collection of *New Keynesian* papers that

“...new Keynesian economists not necessarily believe that active government policy is desirable. Because the theories developed...emphasise market imperfections, they usually imply that the unfettered market reaches inefficient equilibria. Thus these models show that government intervention can potentially improve the allocation of economic resources. Yet whether the government should intervene in practice is a more difficult question that entails political as well as economic judgements. Many of the traditional arguments against active stabilisation policy, such as long and unpredictable lags with which policy works, may remain valid even if one is persuaded by new Keynesian economics⁷”

Thus Mankiw and Romer are very equivocal about intervention despite their belief that market imperfections are central to understanding the economy.

The importance of history in determining which view is more or less popular is clear. The experience of the depression in the 1930's and the success of the highly interventionist post-war reconstruction in Western Europe meant that most economists until the mid-70s were interventionist in instinct. The revival of laissez-faire economics started in the 70s with the world slow-down in growth. It reached its fulfilment in the 1980s with the two icons of free-market economics in Britain and the US, Prime Minister Thatcher and President Reagan. Privatization and de-regulation became the buzz words of the 80's, whilst the international bodies such as the IMF and World Bank tried to foist these reforms on otherwise unwilling countries. Others simply imitated what seemed like a successful policy, if only as a political strategy to reduce taxes.

This seemed to have reached its zenith in 1990 when the Soviet Union collapsed: for many it symbolised the triumph of the free market over the state as an

economic organiser. However, the pendulum is perhaps swinging back. Privatisation has never really worked well, creating many unforeseen problems: regulating a privatised monopoly is not an easy thing to achieve, particularly as in most countries there is little tradition in anti-trust law and regulation. Indeed, the US is the exception: in a wave of anti big-business Populist sentiment the Sherman Act was passed in 1890. Hence the US has a century old tradition of anti-trust litigation and an army of lawyers who make money out of conducting cases under this legislation. In contrast, most of the rest of the world actively encouraged cartels and restrictive practices until the 1960s. Most countries (including the UK) still lack effective anti-trust legislation. Whilst hordes of western consultants and advisers to the ex-soviet sphere encouraged the instant dismantling of the planning system this has had disastrous consequences in the short run. At the time of writing (2000) the transition is still to yield growth in the ex Soviet-Union. One can only compare this to the great success of China, which has instead gone for a gradualist and highly regulated transition, being possibly the most successful conomy in the 1990s. Most of Europe is in recession whilst the Far-East has faced financial collapse. This will no doubt foster a return to more Keynesian macroeconomics and interventionist policies: we will have to wait and see.

4:2 Evidence.

Even though economists might agree on the basic framework, they might disagree on the practical importance of different forces at work. For example, economic theory says that demand curves can slope up or down: in the case of an inferior good, the *income effect* of a price-rise is positive and may outweigh the *substitution effect*. It is an empirical question of whether this happens often and for significant classes of goods. I think that most economists would agree that Giffen goods are a rarity. However, let us take a more controversial case: do labour supply curves slope up or down? In this case, even for normal goods, the income and substitution effects of a wage increase work in different directions. It is simply an empirical question of which will dominate. However, it has important consequences: for example, will people work harder if income taxes are cut (the substitution effect dominates) or less (the income effect dominates)?

Many disagreements are about the relative importance of different factors in a particular phenomenon. For example, financial liberalisation has many effects: some

good and some bad for growth. The key issue is which of these tends to predominate in practice. To answer this we need to look at some evidence. If you do not take the extreme laissez-faire view, then really a lot comes down to what you think in practice the important elements are. For example, whilst the world might not be perfectly competitive, is the imperfect competition that is present a *significant* deviation from perfect competition or not?

Unfortunately, the evidence is rarely conclusive. To test a hypothesis it is necessary to choose a data set, to formulate a statistical model and framework to estimate the economic model. There are different statistical/econometric methodologies about how to go about this. At a first stage there is the testing of the model against the data: is it acceptable as a Null hypothesis? A second stage is to test competing models: this is often not undertaken, and is often inconclusive. At each stage, decisions need to be made that are open to debate. The results of empirical evaluation and testing are often not decisive in convincing people that they are wrong in what they believe (indeed, it is very difficult to convince some people that they are wrong using *any* evidence, let alone econometric evidence). For many economists the process of empirical testing is so imperfect that they prefer to rely on theory alone to inform their views. Certainly, there are few examples of economic theories that have been abandoned solely because of the evidence⁸: evidence plays a role in shifting opinion in the profession, but only a very selective role. If only economists could test their theories in laboratories⁹!

4.4 Arguing and the Advance of Economics.

It is important that economists argue about things. Of course, an economist should be forced to develop his or her views and if possible to find evidence to back it up. However, this sort of process is fairly weak. When we develop a theory, we tend to use it to interpret the world (it is a bit like sunglasses): we tend to focus upon evidence that confirms our beliefs and we ignore or play down evidence to the contrary. Nobody likes to be wrong or to have to change their fundamental beliefs (on the economic consequences of cognitive dissonance¹⁰ see Akerlof and Dickens¹¹).

Argumentation forces an economist to confront and answer to other economists. Other economists will often represent different theories, put emphasis on different evidence or interpret existing evidence differently. The need to persuade others places constraints on what can become generally accepted. Of course, an individual may continue to believe something despite what others believe: however, a belief can only become *widespread* in the economics profession if it has some sort of reasonable foundation. The interplay of debate ensures that there is a constant process of going through arguments, sifting through evidence, looking at new ideas and new evidence. Over time, we can but hope the ideas that become widespread amongst economists are reasonable and appropriate. The process of argumentation ensures that this is the case.

The fact that many controversies remain unresolved does not necessarily mean that there is no progress. Rather, it is like a tug-of-war. The truth lies in between the two teams (points of view): the process of debate determines some sort of equilibrium that reflects a mid-point. As outlined earlier, few people adopt the most extreme views: to some extent we are all eclectic and middle of the road. However, we come at problems from different directions and try to pull other people over towards us. Different types of evidence become salient or important at different times and so lead to shifts of emphasis. For example, with a few hyper-inflationary exceptions, significant inflation was a rarity in peace-time before 1970: economists had tended to ignore it. During the 70's and 80's inflation significant in many OECD countries and inflation and inflationary expectations became a major concern of economists. By the late 90s, inflation was already looking like a phenomenon of the past: the 70's and 80's as much a Dark Age aberration for inflation as the 50's and 60's were a Golden Age of high employment in Europe.

5. The limits of economics: are economists stupid?

Weathermen are often blamed for the bad weather; the messenger that brings bad news is shot.

Economists are unable to fully understand the economy. Does this mean that economists are stupid or in some way lacking in common sense? No, as we have

already seen the economy is an incredibly complex system. There are many processes at work, billions of people all over the surface of the earth linked in a web of ceaseless interaction. As the case of the pencil illustrates, almost every activity we undertake connects us with the wholeness of the world economy. There are many reasons that economics is not easy!

We need to understand the limits of the economists understanding as well as its strengths. We should understand right from the start is that we will never have an understanding of the economy that is like classical mechanics (physics) and its understanding of (for example) the behaviour of the planets. In particular, we will never be able to predict the future course of the economy over anything but the short term. Secondly, we must understand that economists must always use simplified models which leave many and indeed most things out. There is a limit to the complexity of economic models imposed by our ability to think about and use them (although this frontier is being pushed back by advances in computing).

Whilst we may well understand the things that we have put in the model, the things we leave out might be important sometimes. Inflation is an interesting example, as we have already noted. In many macroeconomic models of the 50's and early 60's, the notion of inflation was largely absent reflecting the fact that inflation was not a problem and was so low it could largely be ignored. When inflation became very important in many economies in the 70s and 80s, it became necessary to include inflation as a central feature of macroeconomic models (for example, using the expectations augmented Phillips curve).

The comparison is often made between economics and modelling the weather system. Although we understand most of the underlying physical processes generating the weather, the presence of threshold effects and non-linearities in general give rise to chaotic behaviour. This means that initial conditions matter: small changes in the state of the weather system can have dramatic effects once we move beyond the immediate future. A butterfly can flutter its wings in Kentucky and it leads to snow in Oslo. Furthermore, our knowledge of the state of the economic system is partial and inaccurate: economic statistics are costly to gather and by their nature often

ambiguous, incomplete and inaccurate. National income statistics are a minefield of unresolved problems: whether we are talking of measurements of unemployment, gross national product there are many contentious issues that are not solved, except by accounting convention.

However, the basic processes in economics involve humans: humans acting in organisations and in society. We certainly do not fully understand individual human behaviour: the detailed behaviour of an individual is often unpredictable and incomprehensible to anyone but the person concerned. When groups of individuals get together and interact within groups and organisations, the results can be very strange indeed. Economics is an attempt to understand this in terms of certain organising principles, within the notion of rational choice and equilibrium as discussed in *Equilibrium and explanation*. Economists tend to talk of economic agents: these would be the household or the firm. We assume that the household and the firm act as if they were an individual rational agent. However, this is not the case! There is no better place to start than by examining *Condorcet's paradox*.

Condorcet's paradox.

The French mathematician and man of letters Marie-Jean-Antoine-Nicolas de Caritat Condorcet was born in 1743 and died in 1794. In 1785 he wrote his *Essay on the Application of Analysis to the Probability of Majority Decisions*. He showed how collective decision making could be inconsistent (intransitive) even if the individual preferences were consistent (transitive). Let us have a look at how this works.

Let us assume that the Condorcet family has three members: Pierre , Jacques and Martine. They decide to go out for a meal. There are three types of restaurant: French (F), Vietnamese (V) and Arab (A). Their preference rankings are

	1st Choice	2nd Choice	3 rd Choice
Pierre	F	V	A
Jacques	V	A	F
Martine	A	F	V

They take a democratic vote.

“Shall we go French or Vietnamese” says Pierre; Pierre and Martine prefer French. OK, so French beats Vietnamese. “So, shall we go to French or Arab?”: now, both Jacques and Martine like the Algerian sweets, so Arab beats French. So it looks like Arab food. But Pierre is not so happy with this, so he says, “Let’s have a last think: Do we really prefer Arab to a Vietnamese? I don’t”. “Me neither” says Jacques. Now Martine is unhappy: “Well, we agreed that a French was better than a Vietnamese, so...”. There are many different endings to this story! The point is that anything can happen if they have these preferences, since there is a *preference cycle* if the household uses majority voting as its decision rule. It does not make sense to represent it as a single rational agent.

Now, this is a simple organisation with a simple decision: what about a firm, university or union? Well, sometimes it is almost impossible to understand how some crazy decision has been taken from a common sense point of view. However, when you look at an organisation and how it works it becomes much clearer: every individual can be behaving rationally, but the organisation is set up so that it takes wrong decisions. *When we think of higher levels of organisation and interaction, things rapidly become very complex.*

Economists base their analysis on a hope: in general, firms and households behave as if they were individual rational agents. Now, this may be an a priori hope, an act of faith which is a core belief which remains unquestioned. Idiosyncratic individuals or organisations do not matter. Alternatively, it might be a belief that idiosyncrasies do not matter that much. However, one possible answer that may apply at least to commercial organisations is that the economic process provides a process of natural selection which forces organisations to be efficient and so, presumably, act as a consistent goal oriented entity (at least most of the time). We will look at this argument in the next section of this chapter and in more detail in *Donut World and the Duopoly Archipelago*.

Whilst the Condorcet paradox shows us how economic agents which consist of several individuals may be difficult to understand, how about the actual individual. How does economic motivation fit in with the wider human condition? For most of us, the economic aspect of our lives is secondary: what matters to us is family, children, friends, arts, sport, hobbies, religion or spirituality, politics and ideology.

However, whilst we may not focus on the economic aspects, they surround and pervade most things that we do. First there is the need to earn a living: most people are doing work they would rather not do. If given the choice, who would get up at 7am and rush into work on a crowded bus or train, undertake work they would rather not do, and rush home at 6pm? Since most of us spend 40-50 hours a week working and travelling to work, it is the dominant feature of our lives.

Second, there is the need to have money to pursue our other ends: we need money to house and clothe ourselves and our families; we need money to go out to a restaurant or go on holiday. There is a budget constraint linking all of our different activities: in some sense our expenditure must not exceed our income. As Charles Dicken's Mr Micawber said:

“Annual income twenty pounds, annual expenditure nineteen six, result happiness. Annual income twenty pounds, annual expenditure twenty pounds ought and six, result misery”. *David Copperfield*.

Whilst economics might not be an explicit or conscious element in many of our activities, it has its effect anyway. We might object to its presence when it intrudes, but like Mr Micawber we cannot ignore it except at our peril!

6: The Economy is intelligent.

How is all of the economic activity organised? Well, clearly, no person or group of people organises this activity directly. There have been centrally planned economies, but that is another story. If we think back to the ancient world, the trade in spices and silk, the countries trading with each other had no idea what the world looked like, and probably little idea of each other's existence in any detail.

The answer is that the economy is an intelligent system which organises economic activity: it is a *self-ordering system*. This might sound a little odd. What is the economy: I can see people, cars, houses, products: I can even “see” firms and corporations (at least I understand and can identify them). Surely, the idea of an “intelligent economy” is a useful fiction, as in “the economy behaves as if was organised by something”? No, *I mean that the economy itself is an intelligent self-ordering system*.

This idea that the pursuit of self interest by economic agents could lead to an good outcome has been around for a long time. Perhaps the first person to write about this was Bernard Mandeville (1670-1730) in his famous book, *The Fable of the bees: or private vices and publick benefits*. Mandeville believed that the “private vice” of self interest led to the public good. Adam Smith (1723-1790) also famously wrote

“It is not from the benevolence of the butcher, the brewer or the baker that we expect our dinner, but from their regard to their own self interest. We address ourselves not to their humanity but to their self love...Nobody but a beggar chooses to depend chiefly on the benevolence of his fellow-citizens” Smith (1776).

Adam Smith saw the whole universe, including the economic system as operating to maximise welfare of all beings: the divine Being’s “benevolence and wisdom have, from all eternity, contrived and conducted the immense machine of the universe, so as at all times to produce the greatest possible quantity of happiness” (Smith 1759). Thus when we read Adam Smith’s statements about an *invisible hand* guiding the market, he had in mind the invisible hand of a divine entity. The universe was a machine designed by god, the economy a part of this vast machine¹². This sort of view perhaps made good sense in the 18th century, when most people believed in an active God, but nowadays most thinkers do not see the economy as having a divine order imposed on it.

Older views of the intelligent market were very much linked to the *Laissez faire* view discussed earlier. Indeed at times, this view seems to be very much in tune

with the inimitable Dr Pangloss. As Voltaire's good Doctor said to his patron the Baron:

"It is demonstrable," said he, "that things cannot be otherwise than as they are; for as all things have been created for some end, they must necessarily be created for the best end. Observe, for instance, the nose is formed for spectacles, therefore we wear spectacles. The legs are visibly designed for stockings, accordingly we wear stockings. Stones were made to be hewn and to construct castles, therefore My Lord has a magnificent castle; for the greatest baron in the province ought to be the best lodged. Swine were intended to be eaten, therefore we eat pork all the year round: and they, who assert that everything is right, do not express themselves correctly; they should say that everything is best." Voltaire (1759).

Modern views of the intelligence of markets are not based on the idea of a divinely imposed order, but rather the view that the order of the economy emerges: like life itself the economy is a *self-ordering* system.

To understand this we need to think of other intelligent self-ordering systems. Biological systems are one obvious example (we will be looking into this a bit more in *Donut world and the duopoly archipelago*). Since Darwin, we have understood how a principle of natural selection can operate to create an orderly eco-system: species adapt to themselves, other species and the environment. No one plans this: it is the way nature works that order can arise out of chaos (to steal Ilya Prigogine's book title). If we look at an ecosystem, we see the end result of this process: a delicately balanced system where everything seems to hang together in a finely choreographed dance of life. Natural selection is based on one fundamental principle: those features that enhance replication (the generation of progeny) are favoured. Genes are passed on from generation to generation of all life on earth: which genes prosper and develop depends on how successful they are in making copies of themselves. The genes interact with themselves and the environment giving rise to the natural world of living things.

The ordering principle in economics is almost as simple: activities that generate profits are favoured; activities that do not generate profits are discouraged. In order for some sort of activity to be sustained over time it requires some sort of profit to be made. In order for something to be profitable, it needs to generate revenue: this means that people with money are willing to pay for the activity either directly or indirectly. The costs of an activity need to be less than the revenue, at least in the long run. This idea should not be taken to an extreme: it is not the case that all activities that can make a profit happen all of the time, it also the case that activities that do not make a profit can happen in the short run. There are other motivations driving humans to do things.

If an activity does not earn profits, it can only survive if there is some other such motivation for it. For example, charities and religious organisations rely on a non-economic motivation, relying on people giving time and resources. They are able to undertake and sustain activities which no strictly commercial organisation would undertake. However, you can re-interpret the religious organisation as supplying a product or service (e.g. salvation, entertainment): however, the transactions are largely non-market; whilst the activities and services can be valued implicitly, they do not have a market value. However, there is one school of thought that sees churches as commercial organisations (Ekelund *et al* 1996).

Replication happens in economics: those activities that earn profits are sustained through time and become more common. Profitable firms grow and take others over; less profitable firms wither or go bust. Firms and consumers imitate successful firms and consumers. A good example here is crime. Despite attempts to stamp it out for centuries, the fact that there is money to be made by crime means that it survives and seems to prosper across almost all times and societies.

So, economic order emerges *spontaneously* from the process of selection and replication. The question then arises, is this a good order from the point of view of *homo Sapiens*? Diseases and earthquakes are natural phenomena, but even Dr Pangloss had trouble convincing Candide that such outcomes were the best of all possible outcomes. If we view the order as set up by a benevolent deity, then it seems

pretty plausible that the economy would be set up to operate “for good”. If the order is not set up in this way, then we may have a problem. Disease occurs through natural processes of selection and replication, yet most people believe that we need to intervene and treat or prevent disease in a variety of ways.

Is the order which emerges from the economic system in any sense *optimal* or even just *pretty good*? Or is it sometimes or most of the time pretty bad or very bad? Well, here we come back to the fundamental dichotomy between laissez faire free marketers: these people believe that the market is pretty much as good as you can get. Others disagree.

In order to understand the intelligence of the economy, recall the *Fundamental Theorem of Welfare Economics*. This says that under certain circumstances, which we can summarise as being that markets operate perfectly, the market outcome will be Pareto optimal. Pareto optimality means that the economy yields an outcome such that you cannot make one agent better off without making someone else worse off. If for simplicity we imagined an economy where everyone was identical in terms of their abilities, preferences and initial wealth, Pareto optimality implies that the welfare of the representative household will be maximised. In unequal economies, Pareto optimality is not so attractive: a Pareto optimal outcome might involve very unequal outcomes for different people.

The exact reasoning behind this outcome is beyond this introductory chapter. However, we learn from the introductory economic principles course how resources are allocated by the price mechanism (at least when markets operate competitively). No one needs to know the big picture: each individual agent just gets on with his or her own business, earns money, spends it and lives their life. The market in some fundamental sense “works”, prices are established often without the need for complex institutions or planning by anyone. In the ancient world spices travelled from China and India to Europe, and people in Europe did not even know that China or India existed! It is pretty amazing how all this can happen, but it does and has been ever since the beginning of civilisation.

The basic mechanism underlying the optimality of competitive markets is that voluntary exchange makes both parties better off. If all opportunities for exchange are taken up, then all opportunities for making people better off will be exploited.

So, why do people think that the market might get things wrong? Well, we discussed this earlier, there are fundamentally two reasons. First, the fact that not all exchange is voluntary. This is not the way it is usually expressed, but I think that it captures the notion of externalities and public goods pretty well. An externality happens when I am affected by an action taken by someone else which is not mediated through the market (by which I mean properly functioning competitive markets). In a competitive world, prices reflect opportunity costs. Individuals take actions which reflect these costs. All agents are doing as well as they can given the prices they face. When an externality occurs, this is not the case. Of course, agents continue to do as well as they can, but the prices no longer reflect the true cost. This means that you are able to undertake an action which makes me worse off, which is in effect an involuntary exchange. If a property developer buys some land next to my back door and builds a house there, he makes me worse off. The land price does not include the value of the open view/quietness to me. Likewise, if a car or factory pollutes the neighbourhood, the people polluted are forced to consume the pollution. The market does not work: the outcome is not Pareto optimal. The welfare of all could improve in principle.

The second reason why the Fundamental theorem breaks down is that there is *imperfect competition* in the economy. This theme occurs in several of the following chapters. Perhaps the best way to illustrate this is with the *Prisoner's Dilemma*, a model that we will meet several more times in this volume. This model is very important in the social sciences: *it is seen as capturing the idea that when agents pursue their own interest an inefficient social outcome results*. This stands directly in opposition to the perspective of Bernard Mandeville and Adam Smith. The model is important because it can be seen as standing for the equilibrium viewpoint of game theory, which has become almost as central to economics today as the competitive model.

The basic idea is that there are two players (Alice and Bill) and two strategies: cooperate C and defect D. If both players cooperate, they get a payoff (money, utility) of 2 each; if they both defect, they get 1 each. Now, if one (Alice) defects whilst the other cooperates, the defector gets 3 and the cooperator (Bill) 0. Now, the social optimum can be seen as the outcome when both cooperate: they each get 2. They are both better off than when they both defect and get 1. However, note that when Alice defects whilst Bill cooperates, she does very well (3) whilst he does badly (0). Whilst Alice might be pretty happy with this outcome, Bill would certainly not be. From an objective outside view, we would prefer both to cooperate unless we put Alice's welfare first. Now, what will happen in this situation? Well, there has been a lot of debate about this if the game is repeated, but most people agree that if it is only played once, then the equilibrium is with both people playing defect, D. Why is this? Well, all either player needs to note is that defect earns the highest payoff *whatever the other player does*. If the other player chooses cooperate, I earn 3 by defecting and only 2 by cooperating. If the other chooses defect, I earn nothing if I cooperate and 1 if I defect. So, the argument goes, we will both choose defect. But this is not Pareto optimal. Alice and Bill would both be better off if they could cooperate.

In general, we can see the inefficiency arising quite simply: each person acts to maximise his or her own utility or payoff, but ignores the effects of his actions on others. In this case, if Bill is cooperating, Alice acts to maximize her own well-being and ignores the fact that by defecting her own gain (from 2 to 3) is outweighed by Bill's loss (from 3 to 0). This fundamental feature happens whenever there is imperfect competition. Imperfect competition occurs in any market where agents have market power. It is thus a very important model if we do not live in an economy characterised by perfectly competitive markets.

We will explore these themes in much more detail in this volume, but for now we have the conclusion that although the economic system might be intelligent, it does not have to be socially optimal. We live in a pretty clever social system, the global economy. However, there are winners and losers. Indeed, we all may end up as losers. Take the Greenhouse effect on climatic change: it results from the emission of Greenhouse gases all over the world cumulated year by year. If there is drastic

climactic change in the next century, we may all be the losers. There is no particular reason to think that the market will get this right: the people who will be suffering are not born yet and are unable to express their demands. The market will not work here: it requires governments to have the vision to look into the future and do something now. Some hope!

So here we have the main dichotomy amongst economists. On the one hand we have those who believe that the spontaneous order generated by the economic process is in some sense optimal, based on the model of perfectly competitive markets without imperfections. On the other we have those that believe that the spontaneous order may be far from optimal, based on the idea of imperfect markets. As we have remarked earlier, this split explains the origin of most debates amongst economists. This is as much an ideological difference as a scientific one. As such, it is unlikely to be resolved by evidence unless historical experience provides unambiguous evidence either way.

Perhaps I better come clean here. As you will discover from reading the following chapters, I am myself very much in the second camp: whilst markets work, they are far from perfect. My PhD at Oxford was on the subject of oligopoly theory, markets which are by their very nature non-competitive. Since then, all of my research has explored the implications of imperfect competition, whether it be in labour or output markets, at the micro or the macro level. To me perfect competition is at best an interesting special case, a first attempt to understand the economy. However, to stop there is to miss out on the real journey of discovery, to understand how agents interact with each other. This journey may not be easy and it may have many difficulties, but it has to be done if economics is to be taken seriously and develop as a science of human society.

7. Conclusion.

Well, I hope I have given you some idea of the issues and perspectives on economics that excite me. Economics often becomes a dull subject for students and others, the dismal science. This happens because economists tend to get caught up in their own world and miss the big picture. With increasing specialisation and technical

demands on researchers, they have little time left over once they have done their teaching and research. This is a real shame. The issues and the ideas of economics are fascinating: they can and should be explained to a wide audience in a non-technical manner. The essays in this book have been written not for the general public, but for economics students. However, I have tried to make the ideas as simple and clear as possible whilst keeping their essential message. I very much hope that you find the chapters stimulating and that they convey some of the pleasure and excitement that being an economist has given to me.

¹ However, there is still evidence of trading networks even in Stone Age communities: high quality flint was quarried and mined and then traded over wide areas (Rudgely 1998, p.173).

² This idea is based on a story originally written in 1958 and recounted by Milton Friedman in his book *Free to choose*, written in 1980.

³ In fact, various alloys are used nowadays, but let us stick to good old fashioned (if poisonous) lead.

⁴ In fact, he said ““All those men have their price”, referring to fellow members of parliament.

⁵ Although, as we discuss in *Donut world and the duopoly archipelago*, the concept of the Nash equilibrium originates in Cournot’s 1838 book.

⁶ The term *Laissez faire* is traditionally associated with free-trade: there should be no restrictions to free trade in the form of tariff or non-tariff barriers. However, I use it in a wider context of a general belief that the market is best left to its own devices in most or all areas. “Laissez faire” is a French term which literally means “let make!”, which is best translated as “leave alone”.

⁷ Mankiw G and Romer D (1991), *New Keynesian Economics*, MIT press, page 3.

⁸ It is always possible to recast a theory (“generalise” it) so that it can conform more closely to the facts. A theory is only abandoned when this process of generalisation results in a ramshackle theory and a simpler alternative comes along.

⁹ Some people have interpreted certain decisive historical events as almost experiments: for example, the Thatcher years or the Vietnam war. However, the essence of experimental methodology is that experiments can be repeated and the

design developed over time. Thatcher and Vietnam only happened once, so our ability to evaluate their effects is limited and inconclusive.

¹⁰ Cognitive dissonance occurs when there is a conflict between what you believe and what you see. For example, at various times Messianic groups have predicted the imminent end of the world: a classic case of cognitive dissonance occurs when the end of the world fails to materialise at the appointed time. It is amazing how many people prefer to stick to their beliefs come what may: “do not adjust your mind, reality is at fault”.

¹¹ Akerlof G, Dickens W (1982): The economic consequences of cognitive-dissonance *American Economic Review*, 1982, Vol.72, No.3, pp.307-319.

¹² For a full argument supporting this view of Smith, see Denis (1997).