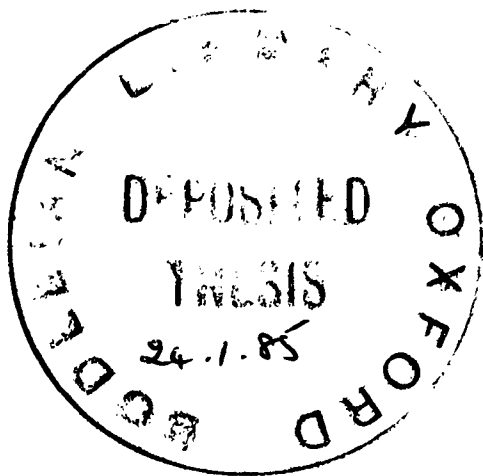


ENFORCED MAXIMISATION:

COMPETITION, EVOLUTION & SELECTION



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ABSTRACT

The theory of 'enforced maximisation' claims that whatever decision procedures individuals and firms adopt, maximisation of utility for individuals and profits for firms will be selected for by the forces of competition. Competition thus enforces maximisation. Evolutionary arguments are typically employed to support these claims, either individually or jointly.

A behavioural economic theory may have three basic components: a theory of preferences, of beliefs, and of the behaviour of individuals in social institutions (particularly firms). To each of these the approach of enforced maximisation has been applied. Becker has argued that people have stable self-interested preferences as the result of selection along sociobiological lines; Muth has argued that individuals' beliefs can be assumed to be represented in a rational expectations fashion, because if they did not do so an arbitrage profit would result, and rational agents would therefore exploit it. Friedman has argued that firms' can be assumed to be profit maximisers because if they did not, analogous to natural selection, they would go out of business.

This thesis argues that these claims are individually unsustainable, and in some form jointly inconsistent. The demonstration uses a series of criteria for deciding between rival explanations. First, it is argued that the sociobiological account of preference formation is deeply problematic, particularly in its account of self-interest and altruism. Second, it is demonstrated that the selection-based argument for the rational expectations account of belief-formation fails. Third, it is shown why profit maximisation is not necessarily enforced by the market.

Finally, the selection for firm's profit maximisation behaviour relies on selection of utility maximising individual behaviour, and such a reliance may be inconsistent with the programme of the theory of 'enforced maximisation'.

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As natural selection acts by competition, it adapts the inhabitants of each country only in relation to the degree of perfection of their associates; so that we need feel no surprise at the inhabitants of any one country, although on the ordinary view supposed to have been specially created and adapted for that country, being beaten and supplanted by the naturalised productions from another land.

Charles Darwin (1859) *The Origin of Species*, p.472.

CHAPTER ONE: INTRODUCTION

It has been argued that the maximisation of utility and profits are justifiable assumptions on the grounds that these modes of behaviour are selected by the forces of economic competition. To act otherwise, the argument runs, gives rise to potential exploitable economic rents. Friedman (1953) informs us that it is reasonable to assume firms maximise profits because if they did not, they would go out of business. Muth (1961) tells us that rational expectations is a reasonable assumption to make about the formation of economic beliefs because the formation of rational expectations is a profit maximising activity. Non-rational expectations give rise to exploitable economic rents. Becker (1976) justifies individual maximisation of self-interested preferences on an explicit evolutionary selection argument.

What each of these have in common is that they all appeal to competitive enforcement of maximisation. They are all indirect arguments, asserting that maximisation in one form or another is enforced regardless of the decision process which individuals actually employ. There is at least an implicit appeal to analogy with evolutionary natural selection in each case, and explicitly in both Becker's and Friedman's arguments. It is these claims which make up what I shall call the theory of 'enforced maximisation'.

This thesis is concerned with examining how robust these claims are, and thus with the relationship between competition, selection and maximisation. It attempts to show how, amongst other things, the process

of competition selects out certain types of behaviour by the negative functioning of its selection filters. I shall claim that this selection process eliminates some inefficient behaviour; yet it does not guarantee either intention maximising behaviour or of outcome maximal choice. The intentional argument is that people who reason according to the maximisation assumption are selected for and hence dominate the population. The outcome maximal choice one is that although people choose for all sorts of reasons, indeed possibly randomly, maximal or best decisions and actions are selected for or against. The thesis is thus a critique of the enforced maximisation assumption as used in economics [1].

The claim that it is futile to criticise this assumption, either because the realism of assumptions is irrelevant (as Friedman (1953) claims) or because maximisation is tautological (as Boland (1981)[2] has recently proposed), is therefore explicitly denied. My critique is however limited to a particular direction, the use of evolutionary arguments to explain the outcome of economic competition. This thesis claims that evolutionary arguments appealing to selection (either by analogy or directly) do not generate maximal solutions (as a prediction of the theory), and the argument is supported by demonstrating how a plausible evolutionary economic argument might be constructed with respect to individual preferences and beliefs, and the behaviour of individuals in firms. In order to criticize the theory it is necessary to examine what

1. I should here acknowledge the important paper with related content by Matthews (1984) on Darwinism & Economic Change, which I read after this thesis was substantially written.

2. Boland claims that because the claim that behaviour is maximising is untestable, it is therefore uncriticisable. See also the comment by Caldwell (1983).

constitutes an explanation of human behaviour, and the important basic components of such an explanation are the preferences and beliefs of individuals, and the institutions within which that behaviour takes place.

Since the enforced maximisation argument has been independently used to justify the assumptions about preferences and beliefs at the individual level, and profit maximisation at the firm level, it is interesting to see whether these are consistent. The thesis therefore looks at the preferences and beliefs of individuals which in part make up the world within which individuals try to achieve the maximisation of their utility function, and how these interact at the firm level, given the individual incentives that the participants have. I am particularly concerned with whether and how peoples' beliefs and preferences have to be incorporated into an explanation, or whether, regardless of these, people are 'forced' to maximise, by the selection mechanisms of economic competition.

The 'enforced maximisation' defense is but one amongst several alternative justifications to be found in the literature of the utility and profit maximising models. Most of these depend upon demonstrating that individuals maximise their well-ordered preferences [1] in at least some ex ante subjective sense. The notion of maximising behaviour is indeed the central principle of modern economics in the mainstream general equilibrium tradition [2], and it is ultimately on this principle that most (but not

1. The term 'well ordered' is used here and throughout the thesis in the sense of an ordering defined by Sen (1979c, p.99) and not in Russell's sense of no infinite chains.

2. Samuelson (1972,p.249).

all [1]) would rest their case for the optimality or efficiency of the market system and economic competition. For the fundamental theorems of welfare economics, relating perfect competition and Pareto optimality, are typically too restrictive in informational demands to provide an adequate and credible ground for defense.

The methodological status of the maximising principle has given rise to a number of problems, particularly associated with its defence and criticisms of it. I shall argue that the principle is all-encompassing: any piece of behaviour can be interpreted, or reinterpreted as if the individual was consistently maximising. But equally there are alternative explanations. Explanation is not unique. The issue at stake is the extent to which the defender of maximising interpretations has to go to carry out a reinterpretation. Becker, for example, has to redescribe altruism, appeal to the costs of time, and introduce human capital considerations into consumption in order to claim that individuals act as if they maximised well-ordered preferences; Muth has to treat ignorance and non-probabilistic uncertainty as if people understood models of the economic structure and formed probability distributions; Friedman has to show why apparant deviations from profit maximisation, like the use of rules of thumbs, mark-up pricing and so on, are really profit maximising decisions, and thus why managers act as if they were actively maximising profits. The issue is what criteria should be used to decide between these rival explanations, and in chapter two I shall spend considerable time looking at how reasons provide a causal account. In particular I shall argue that an act must be "feasible" if it is to provide an explanation, and that typically many maximising acts are not.

1. The most important exception amongst free-market advocates is the Austrian School. See Kirzner (1973) and Hayek (1948).

It should thus be apparent that I am not concerned with what might be described as naive maximisation, associated with assumptions like full information and perfectly competitive environments. As an explanation of behaviour, such a theory is too easy a target. Rather I tackle what might be called sophisticated maximisation, where imperfect information, costs of acquiring information, the redefinition of the objects of choice (especially characteristics and dates of goods), the cost of time, and human capital factors are properly taken into account. It is this model, and not the naive one, which has the universal property in explanation.

I began by noting that the theory of enforced maximisation was one defense of the assumption in the literature. However it is not entirely separate or distinct from others. The wider context within which this thesis fits is the overall viability of the maximising assumption. There are, in fact, broadly conceived, four approaches to defending the assumption or prediction of maximising behaviour.

The first defense claims that the notion of maximisation is a descriptive and explanatory approximation; people do behave individually in a manner approximating the maximisation of a preference ordering using probability information against constraints. Their preferences and beliefs are such that, even under uncertainty, the axioms of the subjective expected utility maximisation hypothesis are approximately met. Deviations from maximising behaviour are either too small to be significant, or they average out in the aggregate.

The second defense claims that the notion of maximisation is a priori true. On this argument, behaviour is assumed to be goal directed in a consistent fashion; it is not under this interpretation an empirical issue

of approximation. This is the view of Austrian theorists [1], and also at least implicitly that held by "revealed preference" theorists.

The third defense is that utility maximisation is an ideal type. There are two variants of this case: either that it represents a benchmark with heuristic explanatory content, or that the ideal is normatively the most desirable. The heuristic value relates to the ability to evaluate less than perfectly rational actual behaviour and efficiency. The fourth and final defense, and the one tackled here, is that maximisation is the enforced outcome of the competitive process.

One particular feature of 'enforced maximisation' is that it admits of the possibility of inefficiency, in the sense of deviations from maximal outcomes. Non-maximising behaviour can arise, since enforced maximisation does not claim that preferences, beliefs and motives are directly of the required kind for descriptive maximisation. Rather enforced maximisation claims to show how some external force, in this case economic competition, imposes a return to maximising outcomes by selecting against such inefficiencies. It admits of the possibility of non-maximising behaviour, but tries to show what the consequences of that outcome would be, and how in particular it would be selected against. It reduces to a dynamic argument about the stability of maximising equilibria.

The first three defenses of the maximisation postulate are intentional; they depend upon the modelling of the purposes and reasoning of individuals. The fourth type with which I am primarily concerned in

1. Mises (1949). See also Robbins (1932), which is discussed below in ch.3, section 3.3(iv).

this thesis is usually presented as an outcome rationality method, attempting to explain actions only by their results and disregarding for the purposes of explanation the reasons why they were produced. In philosophical literature the conflict between these two rationality concepts is described as between 'teleological' and 'functional' explanations. Teleological explanations attempt to explain acts in terms of the intentions and purposes of the actor; functional explanations appeal to the function that the behaviour performs within the relevant system.

The enforced maximisation claim cannot be evaluated without taking a view on these rival methodologies. In chapter two I argue that teleological considerations, while in some cases possibly (though by no means necessarily) irrelevant in animal behaviour, are almost universally vital in explaining human economic behaviour. It follows, I shall show, that the defense of maximisation as enforced by competition depends on descriptive and explanatory foundations related to human mental phenomena. These descriptive and explanatory foundations of enforced maximisation, I shall then argue, are not plausible. Functional explanations fail to take proper account of the reasons why people choose particular actions, and the limitations on the ability of the mind to appraise the totality of options available. The evolutionary defense thus fails on grounds of the "feasibility" of its foundations, and hence it follows that maximisation is not necessarily enforced.

The structure of my argument (and this thesis) is in two parts. The first prepares the way for the critique. I shall throughout use particular criteria of appraisal in rejecting evolutionary arguments. Chapter two considers these in detail, discussing the nature of evolutionary

explanations, the philosophical principles of explanation in appraising the evolutionary explanation, and the nature of economic explanation itself and its derivative components. The first problem of chapter two is, therefore, to give an outline of what constitutes an evolutionary argument. Evolutionary arguments are shown there to be methodologically employed in two distinct ways: either as ultimately biological reductionist explanations, or as analogies. The former approach includes the claim that all behaviour reduces to genetic factors; the latter that there are similarities between animals and humans in economic behaviour, making evolutionary analogies useful heuristics. In order to elucidate these two uses, the components of evolutionary arguments are discussed: specifically the characterisation of mutations, selection mechanisms, phenotypes and genotypes, and replication. It will be seen there that these evolutionary concepts and causal processes are not themselves immune from controversy and ambiguity.

The second problem of chapter two, the philosophical foundations, is crucial to all that follows. If one type of economic explanation is to be rejected, then a prior notion of what counts as a valid methodology for rejection (or acceptance) and some criteria of appraisal are presupposed. In chapter two, these are presented. This presentation hinges on the principle that explanation is necessarily pluralistic: there is, I argue, no single, unique principle of valid explanation. This assertion is rooted in a particular approach to the status of empirical evidence, and is founded on two arguments. The first is the Quine-Duhem thesis; the second is a particular view of causality. Both together, I shall argue, imply that there does not exist a unique relationship between a specific set of data, and a specific set of theoretical terms. Given that, and hence the

inability to decide the validity of the theory of enforced maximisation on empirical grounds, a series of alternative criteria of appraisal are presented: the most important of which are the causal relation proposed, the rationality principles, the classificatory system, consistency and the role of empirical evidence. These criteria are used to give a causal account of human conduct, limited by the feasibility of appraising alternatives, and by the way in which beliefs and preferences are combined to produce actions.

The other key foundation to the critique of part two of the thesis is the relevant background historical literature in economic thought. Economics, as a social rather than natural science, develops out of its past. Maximisation and self-interest have received numerous treatments in the literature and it is thus hardly surprising that many current disputes have been previously well discussed. In chapter three, particular attention is focused on the relationship between economics and biology, the development and identification with the notion of self-interest, and the domain of economic explanation. To an extraordinary degree, these latter two issues have remained matters of dispute. I shall present different views on the subjects and comment on their validity. In particular I shall present Becker's claim for universalisation of his "economic approach" which has been described as "economic imperialism". I shall also present the sociobiologists claims to universal domain - what might be called the theory of "biological imperialism". These arguments are necessary building blocks for the substantive critique of enforced maximisation.

Part two is built then on these foundations. Since the actual employment of evolutionary arguments in economics is so diverse, the second

part of the thesis, the critique, concentrates on the problems confronting the components of economic explanations distinguished in chapter two: preferences, beliefs and institutions. A behavioural theory of enforced maximisation, either in its analogous or reductionist form, must apply to each component, and the second part of this thesis therefore tackles each in turn. The approach is to a certain extent by example, but with a specific intention of showing why appeals to evolutionary theories are inadequate as defences of enforced maximisation with respect to preferences (chapter four), beliefs (chapter five) and firms (chapter six).

Chapter four is concerned with preferences. Typically these are assumed exogenous and constant in the traditional ordinal utility approach. The application of enforced maximisation here is usually reductionist, and in economics is associated largely with the work of Gary Becker. The chapter has two parts which form the steps in my argument. In the first part, I show why preferences are in the main endogenous, and to this end a body of evidence is presented and reviewed to show why a theory of preference formation is required as a result of systematic violations of the axioms. Given, at the next stage, that such a theory is required, it is then shown why the sophisticated claim for constancy given by Stigler and Becker (1977) is implausible.

The second part of chapter four considers the domain argument of 'economic' preferences and maximisation, in the light of Becker's claims concerning its universalisation. This is important since it settles the extent of 'evolutionary' behaviour. Given endogeneity and domain, I tackle next the sociobiological approach of Hamilton, Trivers and Wilson, and Becker's explicit application to economics. What these writers have called

the 'central problem of sociobiology' - altruism - turns out to be critical to enforced maximisation (because of its relation to self-interest), and I show how alternative interpretations of altruistic behaviour would undermine the enforcement argument. These reasons include non-consequentialist behaviour, commitment and non-utility information.

The chapter necessarily covers a lot of ground, but the structure of my argument requires this. I have to show why preferences are endogenous (and hence why the question of preference formation arises at all), what the domain of self-interest is, how the evolutionary argument suggests that both self-interest and altruism (widely or narrowly conceived) are selected for, and why this sociobiological approach is deficient.

If the reductionist argument is inapplicable to preferences, the first component of an economic explanation, I show in chapter five that it is even less appropriate to the formation and revision of beliefs. For the second part of the maximising account of human behaviour is the treatment of behaviour under uncertainty via the subjective expected utility [SEU] maximisation hypothesis. The theory of beliefs it proposes is a theory of consistency. It is not directly related to reality. The content of beliefs is, as with preferences, not the primary concern. The theory of enforced maximisation of beliefs however claims more than the SEU theory, making claims about content as well as consistency. I first claim in chapter five that the theory of rational expectations is the endogenous enforced maximisation theory of the content of beliefs. It describes where the beliefs come from, about which the individual should be consistent. These rational expectations beliefs are, Muth (1961) claimed, the profit maximising ones. Deviations from rational expectations on the part of

individuals are ruled out on the grounds that should such deviations occur, a potential economic rent would arise, which maximising agents would be irrational not to eliminate. It appeals specifically, as Muth pointed out, to just the sort of 'as-if' justification employed in evolutionary explanations. In this chapter, I shall therefore be concerned to provide a critique of the informational content of this enforced maximisation theory of belief formation, and I do so from two directions: the underlying assumptions concerning the structure of the economy and with respect to probability and search. The upshot of the discussion is that for the second component of economic explanation, there is no 'as-if' justification for the general selection of maximising behaviour in belief formation. The criteria of method to which I shall appeal, and which is discussed in chapter two, is predominantly that of "feasibility".

The third component of an economic explanation, and that to which most frequent reference to evolutionary processes is made, concerns firms. The argument here however is typically not causal reduction, but rather analogy. The first clarificatory task of chapter six is therefore the methodological validity of analogous arguments, and the relationship between reduction for preferences and beliefs, and analogy for firms in which individuals necessarily participate. To the extent that firms are managed by and employ individuals, the maximisation of profits or shareholder wealth, and the selection and discrimination against firms that do not do so, presupposes that individual behaviour is selected for and against. But the reductionist claim in this respect will have already been rejected in chapters four and five. Thus the claim that competition acts via natural selection to guarantee the maximisation of profits, put forward by Friedman and others, is invalid to the extent that it is prefaced on

individual enforced maximisation. If the theory of enforced maximisation refers to firms (as Friedman claims it does) then it must be compatible with the behaviour of the objects of that selection - individuals. Furthermore it is also implicitly assumed that the aggregation of particular types of individual preference, the preferences over objectives of managers, produces certain well-defined singular objectives for the firm. The production of a singular objective function requires that the firm as an institution overcomes the aggregation of conflicting preferences to form a unique ordering.

There are two arguments here. The first is a point made by Darwin. Selection will not of itself produce perfection. As Darwin (1859,p.201-2) put it:

"Natural selection tends only to make each organic being as perfect as, or slightly more perfect than, the other inhabitants of the same country with which it has to struggle for existence. And we see that this is the degree of perfection attained under nature Natural selection will not produce absolute perfection, nor do we always meet, as far as we can judge, with this high standard under nature."

It is only if the existence of maximisers competing against non-maximisers is first assumed that maximisation will be the outcome of competition. However, even where maximisers do the selecting, I show that it is not necessarily the case that maximisation is enforced. There are circumstances where this is not the outcome.

The second point concerns the actual selection mechanisms which operate on firms. I distinguish two sorts: internal constraints and

external, inter-firm competition. It is shown in chapter six that neither of these is a tight enough filter to enforce maximising outcomes. Much satisficing behaviour can both survive in the face of competition from other firms and in individual consumer choice between firms. Within institutions, preferences and incentives vary between individual members, and enforcement of policies aimed at maximisation of profit is costly. Externally, in oligopolistic markets, which dominate modern industrial economies, firms are interdependent and subject to similar pressures resulting from the separation of ownership and control. Imperfect information again permits firms to deviate from profit maximisation, without appropriate enforcement mechanisms being available.

The thesis thus demonstrates that there is no compelling reason to suppose that maximisation is enforced on preferences, beliefs or firms, and the arguments involving reduction or analogy with evolution are defective. In the concluding chapter, some of the implications are considered. Economic competition does not guarantee efficiency in the sense of maximising behaviour that I have used it here. By implication it follows that some of the force of efficiency in a more traditional sense is also undermined. Thus the appeal of market solutions as guaranteeing a particular outcome is weakened, in the sense that those who wish to defend it must find some other argument. Positively it follows from the thesis that the content of preferences and beliefs, and the internal organisation of the firm are important to understanding behaviour, and that they should be explicitly modelled, rather than treated as exogenous. The traditional treatment of preferences, beliefs and rational action is too narrow, failing to take account of the diversity of human conduct. Both Becker's work on preferences, and Muth's on expectations, have opened up these

important questions. They have asked the right questions: unfortunately important aspects of the answers they have given are mistaken.

PART ONE:

FOUNDATIONS

CHAPTER TWO: METHODOLOGICAL FOUNDATIONS: Evolutionary theory,
causality and the components of economic explanation

2.1 INTRODUCTION

The first foundation for the critique of the theory of enforced maximisation is the appropriate methodology for appraising it. There are three main issues involved. These concern how an evolutionary explanation is constructed, what count as general criteria of explanation, and how economic explanations are made up. The components of each type of explanation - evolutionary and economic - are exposted here to see what their relation and basis of comparison might be. The question of what counts as a good explanation appeals to general criteria and in this chapter a series of such criteria are discussed.

In section 2.2 the way in which evolutionary arguments are used in economics is discussed. A series of distinctions are made and the major components and concepts of evolutionary theory are exposted. The distinctions made include that between the use of the evolutionary argument as a reductionist explanation, reducing social behaviour to biological causes, and as an analogy [1]. It turns out that this distinction separates out the treatment of preferences of individuals, and the use of the analogy in the theory of the firm. This distinction is exploited in chapter six to point out some of the inconsistencies in the use of evolutionary arguments in the theory of the firm.

A second distinction concerns the relation between functional and

1. The analogous use is discussed in chapter six, section 6.2.

teleological or purposeful explanation. The economic theory of utility maximising behaviour is a theory of purposeful behaviour. Evolutionary arguments are not directly concerned with the reasons and motives for behaviour. I therefore consider first whether a theory of purposeful behaviour can be given a non-rational defense. It remains in this section to outline the component parts of an evolutionary theory, in particular mutations, selection mechanisms, genes, replication, phenotypes and geneotypes, and evolutionary stable states.

In section 2.3, the methodological criteria of theory appraisal are discussed. In order to dismiss a particular explanation which claims to cover observations of actual behaviour, a series of criteria are required by which to judge between it and its rivals. Economists rarely make the criteria they use explicit. They are prone to assume that theories are commensurable without explaining how or why. In this section, I put forward the criteria of "causality" and "feasibility". In passing I show how the counterfactual definition given by Hicks of economic causality (1979) relates to the famous Mackie INUS condition.

Having looked at the components of evolutionary theory, and the criteria to appraise them, the third remaining methodological foundation is to outline the components of economic, as opposed to general, explanations. The question of the domain of economic explanation is left to chapter three. In section 2.4 of this chapter the components of preferences, beliefs and institutions are separated out. It is not that they should necessarily be evaluated in isolation, but rather that evolutionary arguments have been applied differently to each, according in part to our distinction between reduction and analogy. Each of these three

are then analysed in chapters four, five and six respectively.

2.2 EVOLUTIONARY EXPLANATION

(i) Two types of reasoning: Reduction and analogy.

My first point about evolutionary arguments refers to the way in which they enter into explanations. In particular, in economics they are used in two different ways. Either they are used in a reductionist all-encompassing argument claiming that all social and individual behaviour is ultimately caused by biological factors, or as an analogy or metaphor. In general in the literature the former explanatory purpose has been directed towards individual preferences, and the latter towards firms. Beliefs have been curiously left out of the discussion. As Hirschleifer (1977,p.39) points out that:

"as applied to firms ... biological reasoning is only a metaphor. In particular, firms do not follow the reproductive laws of biology... By way of contrast, human individuals, families, races, etc, are biological entities."

One consequence of a failure to employ my distinction is that the precise relations between reduction and analogous explanations has not been adequately discussed, and in economics, how individuals are 'biological entities' whereas firms, which are made up of individual members, are not. The ways in which these affect the explanatory relation between firms and individuals has been neglected.

- (a) Reductionism

The reductionist approach posits a direct causal relation between observed behaviour and genetic constitution. Two questions which arise

immediately are whether reductionism is a valid methodological approach, and if it is valid, whether genetic reductionism is the correct formulation. The methodological question is a central topic of the rest of this chapter. In particular, the validity of a methodology is shown to depend on the provision of a causal account of behaviour meeting a series of general criteria. I shall argue that the reasons for an action, and the feasibility of those reasons must be incorporated in the provision of an adequate explanation.

With regard to the specific genetic basis for reduction, its application at the individual level is either via beliefs and/or preferences. If preferences, the important question is how selection operates on them to produce the 'best' set, where best refers to survival value. As will be seen in chapter four, acting self-interestedly may not be the optimal strategy for survival. The argument concerning the validity of reductionism turns on whether showing that a type of behaviour favours genetic replication implies that that was its cause.

- (b) Analogy

The second application of evolutionary argument is by analogy, and may in principle apply to individuals (preferences and beliefs) or to firms. Typically the literature concentrates on the latter. The questions that arise are whether argument by analogy is methodologically acceptable; what the criteria for the use of analogies in causal explanation are; and when one analogy is preferable to another. Specifying the analogy at the firm level with respect to competition is discussed in section 2.4 below, and more extensively in chapter six, section 6.2. That chapter begins with a discussion of the relation between analogy and reduction in explanation,

and the validity of the method of analogy.

(ii) Two types of rationality: functional and teleological explanation

An evolutionary argument is primarily a functional one, concerned with the consequences of actions on fitness, and only indirectly with the reasons why people choose them. It thus contrasts with teleological explanations which stress the purposes and goals of individuals. In genetic explanation, the origin of choice is not stressed; selection and replication determine the success of mutations, of which variants of preferences and beliefs are but examples. But the selection of these 'mental' states is indirect: some types of behaviour are selected for and against by the environment. The explanation of behaviour is not constructed out of the reasons for actions, only the actions themselves. To explain the existence of a certain type of behaviour, appeal is made to the function of that behaviour within the system which is its context. Its success depends on the response of the system to that act. As Wilson (1975,p.3) put it, "the organism is only the DNA's way of making more DNA". Wilson, perhaps the most famous of the modern sociobiologists, adopts here a strong biological determinism. Using the word 'only' he rules out the possibility that some outcomes might have other causes. Because some outcomes are "biologically determined" in the sense of caused by the replication of DNA, it does not follow that they all are. To reply to Wilson requires thus only that a plausible account is given of at least some behaviour in terms other than of fitness and DNA reproduction.

Jon Elster (1983, pp.52-3) gives a definition of a functional explanation as follows:

"a structural or behavioural feature of an organism is functionally explained if it can be shown to be part of a local individual maximum with respect to reproductive capacity, in an environment of other organisms which have attained similar local maxima. If we can show, that it, that a small change in the feature in question will lead to reduced reproductive capacity for the organism, then we understand why the organism has that feature."

Elster's definition identifies functional explanation with at least local optimality. But even that is quite demanding: to say that an organism has a particular characteristic by virtue of its adaption to the environment, does not imply that it could not make a local improvement. It is very important to realise the methodological leap made here. I shall argue that the assumption of optimality - local or global - does not follow from the fact of adaptation. Something more is required about the force or strength of the selection mechanism, and I shall claim that, when we consider preferences, beliefs or firms, this is not forthcoming. Elster's definition is too strong, and furthermore, the relation between function and cause relies on the correctness of the biological account of evolution.

Against such a functional account may be set a different teleological methodology, which stresses the importance of the goals, procedures and belief structures of the acting individual. Goals are only in part those of the system: the individual may partially adapt the environment to his or her own purpose. The argument is conducted from both within the evolutionary framework, stressing the importance of beliefs and preferences on outcomes, and thus challenging the theory's consistency and internal

causality, and from without, stressing rationality and feasibility.

Behavioural economic explanations typically include preferences and the beliefs which suggest jointly alternative policies. But preferences and beliefs are not sufficient in themselves to bring about actions. A theory of action requires, in addition, intentions or the willing of actions. As Nagel (1979, p.278) put it:

"it is not the goal that brings about the action. It is rather the agent's wanting the goal, together with his belief that the action would contribute to the realisation of the goal, that does so."

Behaviour is goal-directed or teleological if it is legitimate to ascribe intentions as well as preferences and beliefs to individuals. Thus they must function as reasons for actions, which, as will be shown below (p.37f), are to be regarded as partial causes.

Functional explanations presuppose a substantive or outcome rationality. The reasons for action in themselves are unimportant. But whereas substantive rationality refers to behaviour "when it is appropriate to the achievement of given goals within the limits imposed by given conditions and constraints" (Simon (1976, p.130)) an alternative view - procedural rationality - focuses directly on reasons for action. Behaviour is procedurally rational "when it is the outcome of appropriate deliberation. Its procedural rationality depends upon the process that generates it " (p.132).

In the context of the firm, when the outcome is the consequence of the deliberations of a set of managers rather than a single individual, there are two sets of important procedures. The first is that of the individual;

the second that of the interactions of individuals. Furthermore at the firm level, the possibility of market power implies that passive response to the environment (price-taking behaviour for example) dictating outcomes can be partially replaced by conscious manipulation. As Penrose pointed out in her article on biological analogies (1953,pp.813-4):

"Once human will and human motivation are recognised as important constituents of the situation, there is no a priori justification for assuming that firms, in their struggle for profits, will not attempt as much consciously to adapt the environment to their own purposes as to adapt themselves to the environment. After all, one of the chief characteristics of man that distinguishes him from other creatures is the remarkable range of his ability to alter his environment or to become independent of it."

Evolutionary theory has then an immediate methodological disadvantage when applied to economics. It plays down the importance of reasons for action. In section 2.4 below the causal importance of these will be examined. But, lest it should be imagined that evolutionary theory itself has a well-defined and uncontested structure, I next show that this is far from the case.

(iii) Different Theories: Darwin & Lamarck

Turning then from the use and method of evolutionary theory, let us now consider their structure and component parts. Evolutionary theory in its modern synthesis has three parts [1]: the source of variation, the

1. See Lewontin (1970).

selection process, and the transmission mechanism. Thus for evolution to occur, a given set of objects must exhibit variation, some individuals must be fitter than others, and there must be correlation between the fitness of parents and the fitness of offspring. This synthesis has emerged and developed from Darwin's work, and one of its rivals, that of Lamarck, has been discredited as an biological explanation. However since the latter has had some analogous applications in economics [1]. I shall also consider it briefly here.

Although Darwin's theory is the precursor of the one most familiar today, Darwin himself lacked a theory of genetic selection. Arguably he believed in selection at a more individualistic level, though of course the location of selection remains a contested issue both in interpreting Darwin and in genetic theory [2].

Lamarck's theory of evolution rested on the notion that desirable characteristics were acquired by individuals as a consequence of environmental pressure, and thus that adaption was ecologically rather than reproductively determined [3]. Lamarck argued that the source of variation was not random, accidental mutations as Darwin thought, but rather that there existed a correlation between the functional requirements as demanded

1. In particular in Nelson & Winter (1982), who claim that their theory is a Lamarckian one. This is further discussed in chapter six, section 6.3 below. I comment on the historical co-development of evolutionary and economic theory in chapter three below, section 3.2.

2. See Lewontin (1983), on the conflict between Mendel's internal (ontogenetic) selection and Darwin's external (phylogenetic) method.

3. Darwin(1859) ch.1, 'Variation under Domestication', p.8 makes his basis of theory in reproduction quite clear. See also for further clarification between his own and Lamarck's theory, p.3,10,134,242,336 & 351.

by the environment and the likelihood of the occurrence of an appropriate adaptation. On Darwin's theory, strictly speaking, the environment does not of itself demand anything. Since Darwin has been vindicated in this difference of views, Lamarck's theory as part of a reductionist programme is untenable [1]. However this does not, of itself, weaken its value as an analogy.

The analogy has a reflection in economics: firms respond to changes in market demand and to changes in costs and technology. They acquire characteristics such as knowledge, skill and technique to enable them to respond to new demands and costs. Knowledge is mainly if not entirely an acquired characteristic: the passing on of knowledge between and within generations is not accidental (as are mutations), but the quite deliberate consequence of learning [2]. Such a process might be very rapid, since it is not limited by reproductive life-spans. But although the Lamarckian reactive model has these common analogous properties, it is not sufficient to guarantee the maximal acquisition of acquired characteristics as will be seen in chapter six below. Indeed it turns out that, to the extent that the analogy of selection deviates from the Darwinian towards the Lamarckian theory, behaviour can further deviate from the maximal case.

1. The real failure of Lamarckian theory is in explaining how required characteristics could enter the genome. Individuals may acquire characteristics and learn, but there is no genetic transmission mechanism in reproduction.
2. This point is noted in Gowdy (1983). Culture may have its own "evolution", as for example Dawkins (1976) has argued. But this 'evolutionary' process is not necessarily either a biologically determined or maximising one.

(iv) Components of evolutionary theories

Theories of biological evolution have, as I noted above, a set of common factors which are incorporated as individually necessary and jointly sufficient for explaining behaviour. These are the causal method of producing observable organic traits from particular genetic factors, mechanisms for producing variations in genetic structure, a transmission mechanism for passing genetic variations between generations, and environmental factors governing the selection by eliminating mal-adjusted organisms. These theoretical entities and the causal relations between them may be considered under the following headings: mutations, selection mechanisms, the distinction between phenotypes and geneotypes, and replication. Let us consider each in turn.

- (a) Mutations: the source of variation

Mutations have three characteristics in an evolutionary argument. They are small, random, and the speed of their effects is usually, but not always, slow. Smallness is a crucial concept in economic theory, and particularly in the theory of perfect competition, where small marginal adjustments are assumed possible to perfectly attain an equilibrium. The biological concept is quite precise in the genetic context. It refers to small substitutions in the DNA double helix [1]. It does not mean that the consequences of such a substitution may not themselves be very large. This is especially so when the gene within which the mutation occurs influences the development of other cells or even genes [2].

1. The transmission mechanism is as follows: DNA is made of nucleotides; proteins are made of amino acids; DNA instructs ribosomes in the formation of proteins.

2. Cancer is an example of such controlled change.

When a variable is claimed to be random, one of two arguments is involved. Either that variable has an unrelated cause to the process which the evolutionary theory is trying to explain, or alternatively the claim is that the variable is causeless. Now the idea of a causeless event is difficult to understand, and it is not necessarily required, so that here I shall keep to the 'unrelated cause' definition. The central issue between Darwin and Lamarck concerns this randomness assumption.

With regard to slowness, replication of mutations occurs with the speed of generational reproduction. This is limited by the age of maturity for each generation [1]. Whether or not maximising outcomes are consequential from random mutations depends on replication.

In the analogy between natural selection and economic competition, the concept of a mutation could be reflected in a series of possible candidates, though these may not, as will be seen, fulfill all the criteria, either of explanation generally or in terms of the specific characteristics of smallness, slowness, and of randomness. These include the theory of innovations put forward by Schumpeter (1934) and more generally of 'impulses' by Hicks (1971), as explanations of economic growth. Such an economic theory of growth on particularly Schumpeterian lines has been developed as an evolutionary theory by Nelson & Winter (1982b). In chapter three it will be shown by way of example that the first of these is at best an imperfect analogy. In chapter six, the third is

1 . Darwin believed that change would be slow, because of the environmental impact on individuals being slow to become hereditary. Indeed in his earlier period at least, he believed in the principle of Yarrell's Law, according to which it takes many generations of impact for the effects of the environment to become strongly hereditary. On this see Mayr (1983) p.32.

critically examined.

- (b) Selection Mechanisms

An evolutionary theory contains one or more selection mechanisms which discriminate between acceptable and unacceptable characteristics.

Selection is a causal process, filtering behaviour. It is causal in that to claim a trait has been selected is to claim that having this trait causes differential success, ceteris paribus [1]. Clearly the characteristics of this selection process are particularly important to the use of both the reduction and the analogy argument. Firstly, in order to enforce maximal outcomes, the filters must be tight or fine enough to eliminate any deviations from the best. To enforce maximising outcomes, they must discriminate against non-maximising intentions. Secondly for the analogy, each selection mechanism must have a counterpart in economic behaviour. On the latter point there is much confusion, as between whether it is just competition which is analogous to natural selection, or rather particular mechanisms of competition. Ghiselin's (1978,p.233) statement illustrates that confusion:

"If it be argued that biology is not wholly an economic discipline, I can only answer that it actually is. All the properties of organisms, without exception, are the result of evolution, and the mechanisms of evolution, selection, is nothing more than reproductive competition between members of the same species. Competition, of course, is as fundamental an economic phenomenon as can be imagined."

1 . See on causality and selection, Sober & Lewontin (1982), especially pp. 159-60.

For the literal case of reductionist explanation, the selection mechanisms must ultimately be the same, and the domain of the competition coextensive [1]; for the metaphor they need not be. Let us look at some of the resultant problems. The first is whether the filters actually are the same, and the extent of deviation. The most important difference concerns the level of conscious deliberation in choice, the importance of reasons in explanation. Consumers can, for example, select with respect to firms which they are dissatisfied with, by either refusing to make further purchases, by complaint, or by loyalty in continuing their custom because of the costs of alternative arrangements. Hirschman(1970) has called these options respectively exit, voice and loyalty, though my application of them is somewhat different. The diversity of such responses is not mirrored in natural selection, because the relatively lower importance typically attached to deliberation and reasoning in choice and behaviour.

A further problem arises once a mutation has been accepted and dominates the population, in that the background conditions of that population and its environment are no longer the same. Hence further mutations are accepted or rejected not on precisely the same criteria as the previous ones [2]. The beliefs of other people form important component parts of the environment and, as will be seen in chapter five, this structural framework within which choice takes place has important implications for the discussion of optimality. If background structural conditions alter, then the meaning of optimal adaption becomes ambiguous.

1 . See discussion of domain in chapter three below.

2. It is possible at least theoretically that an analogous paradox to Scitovsky's may arise. A new position is preferred to the original one, and once there the original position is reselected.

Rather than in the static case, with given exogenously fixed background conditions, in the dynamic case the issue turns on the interaction between the selection mechanism and the partially endogenous environment.

Selection alters not only the individual, but also via the individual the environment. If optimality is to be defined and compared in different periods, ceteris must be paribus, and in dynamics there is no good reason for supposing that this will be the case.

- (c) Levels of selection: Phenotypes and Genotypes

In evolutionary theory there is an important distinction between the genetic blueprint (which is flexible with respect to genetic change) and the organism, which is the quasi-fixed outcome [1] of the development of that flexible genetic code. Natural selection selects at the phenotype level, not individual genes. Gene-groups rather than individual genes themselves are selected, so that an 'advantageous' gene when associated with other genes may be eliminated [2].

In economics, the natural analogy is between a plan and the outcome of the implementation of that plan. The one must in genetic models strongly influence the other. The source of variation is the gene, not the phenotype. In economics, it is frequently the case that the outcome is not an exact consequence of the plan. Plans are typically altered during the development phase, and they frequently lead to what Hayek and Popper

1 . Quasi-fixed because some variability is introduced via the action of the gene through a variable environment.

2 . Dawkins (1976,p.40) argues that on average good genes survive, even if selection occurs at the phenotype level. This is controversial and by no means obvious. In reply see Sober and Lewontin (1982) and Dawkins (1980) furthering the debate.

describe as the unintended consequences of human design [1]. Whereas the gene ceteris paribus determines a unique outcome, the economic plan is typically only partially specified, in the sense that it can incorporate only a partial understanding of the options available. Information is limited and costly; plans are thus only approximations. Genotypes typically are not.

Levels of analysis

The unit of analysis of economic behaviour thus might be the gene, the individual, the firm or the society. The appropriate level depends upon the extent to which the evolutionary selection unit is the society or the individual and thus the extent to which survival depends on the individual qua individual [2], or the individual qua member of society. There are a number of stages between the gene and behaviour, including molecular combinations, such^{that}/there can be no simple transmission relationship between the two. Indeed one gene can act on other genes and/or they may cause proteins to be formed which are their outward expression [3]. While firms and societies might be the level at which selection takes place, the degree to which each fulfills the objectives of their participants - shareholders, managers and workers - determines the tightness of selection on individuals. The case for the more aggregated level of evolutionary unit has been put forcefully by Guha (1981,p.9-10)[4], who points out that

1 . Popper (1961, p.64f) and Hayek(1982, p.61f).

2. The selection of reasons and mental states depends on their level and is dealt with below, pp.147-9.

3 . See footnote 1 on p.28 above.

4 . See p.172 below on Guha's argument.

typically for humans the evolutionary unit is the society or community to which they belong. Individuals can be regarded as playing a strategic game with society, for it is at that level that the pay-offs are decided. On this approach, the choice of evolutionary unit is an empirical one concerning the relative pay-offs. It should be noted however that the location of the level with respect to pay-off does not decide between the literal and metaphoric use of evolutionary concepts in economics. There are many reductionist models in evolutionary theory which purport to explain the existence of social altruistic acts. However these models are designed to locate individual incentives to group altruism. Evolutionary theorists have developed the concept of reciprocal altruism to cover these cases. I explore this concept extensively below in chapter four [1].

Coordination of individual incentives to produce a maximal group outcome is particularly problematic for the theory of the firm. Individuals may have incentives to deviate from policies which would lead to the overall profit maximisation of firms. In particular, as will be seen in chapter six, the correct incentives for all members of the firm depend on the distribution of rewards.

- (d) Replication: the transmission of selected genes

If mutation is the source of change, replication governs its success, if selected (or rather not selected against). Because change is assumed to be limited by the reproductive life-cycle in evolutionary theory, only if similar conditions are repeated with only minor change over generations, will the desirable mutations become accepted and dominate the population.

1 . See Trivers (1971), Maynard Smith (1983) and p. 176f below.

In genetic theory, and the reduction case, replication is by reproduction. Reproduction may take various forms; sexual reproduction being the typical but by no means only method of transferring genetic material. In the economic analogy, it is copying. For the firm, replication by copying [1] rather than sexually reproduced mutations is what counts for profits. The analogy is thus here quite weak: there is no equivalent sorting process in economics.

The economic parallel is indeed weakened by a series of considerations. A stochastic mutation, if by chance it happens to be the optimal innovation for a given structure, will be selected for only if a series of hurdles are overcome. Replication will lead to convergence on an optimal outcome only if the environment is sufficiently stable for repeatability to facilitate that convergence. The problem is that economic replication is not instantaneous; it takes time, in which background conditions may alter. The optimal solution in one period is not necessarily optimal in the next. Furthermore Arrow (1981) has pointed to the more general problems in the economic case. He notes that not all arbitrage possibilities to enforce convergence can actually be transacted where markets are imperfect and, importantly, he pointed out that the optimal act, if at least some others' acts are irrational, is not necessarily to act rationally oneself [2]. By rational, Arrow here includes two notions, the one being what might be called direct maximisation, meaning that the individual chooses the maximising act on an assumption of

1. Imitation is the method in Schumpeter's theory of economic growth; see ch.3, section 3.7(iii) below.

2. This point is developed in ch.5, p.223fbelow.

zero (Cournot) response from others, assuming his act to be independent, and strategic maximisation where others' possibly irrational behaviour is taken into account. If Arrow is claiming that irrational acts may be superior to strategic maximisation, the claim is substantive. If it is merely the claim that strategic rationality dominates direct maximisation, it is somewhat obvious, unless information costs are appealed to. The extent to which repeatability is not a normal feature of economic environments limits the effects of selection on particular innovations. Copying requires that new information and techniques be incorporated optimally to fulfill the analogy. But there are ex ante costs, which may be themselves imperfectly foreseen. Managers have to devote resources to learning and adapting to change. If competitive selection takes time to eliminate inefficiency; optimality is not instantly attained. Again the time period of selection has to be considered: the attribute which the environment of today eliminates because it is inefficient with respect to today's environment, may turn out to be well-adapted to the next period's environment.

- (e) Maxima, equilibrium & evolutionary stable states.

In discussing replication, the idea of convergence on optimal states naturally arose. The comparative term to an optimal state in economic theory is in biology the evolutionarily stable state (ESS), defined as a state for which there exists no available invading strategy. It is a niche in the environment which cannot be successfully upset by any alternative currently genetically available; it is unbeatable. If all members of a population adopt it, then no mutant strategy could invade the population

under the influence of natural selection [1]. What is selected for is fitness. Fitness itself is a primitive term with respect to the theory of natural selection [2]. The population climbs this fitness gradient until a point is reached from which the only possible direction is downwards. At that point it has reached an ESS.

Elster (1983,p.50f)[3] has pointed out in describing this point, that it is a local and not necessarily a global maxima. Fitness can be measured ex post by the number of progeny and thus the success of reproducing genes. But such a measure is relative; it measures only the relative success of more fit genes against less fit genes. The degree of fitness in an absolute sense cannot be assessed. Similar analogous problems, as will be seen below, exist with the measurement of efficiency; relative cost measurement is more straightforward than absolute. Satisficers rather than maximisers might be the selectors.

The important point to note about ESS is that it is a Nash equilibrium concept. The alternative cooperative or collusive equilibrium, which is used in discussions of the advantages of reciprocal altruism, will be discussed in chapter four below. The problem with these equilibrium concepts will be seen to revolve around how it might be possible for the latter equilibrium to genetically evolve out of the former.

1. Maynard Smith(1983) p.10.

2. The claim that it is a primitive term has been powerfully argued by Lewontin (1983). It is controversial and it should be noted that there have been numerous attempts at definition, including most frequently 'inclusive fitness'. See also Rosenberg (1983).

3. It should be noted that the ESS is not assumed reached by Darwin. Even the local optimum could be invaded. Indeed the absence of the possibility of invasion would mean that evolution had come to an end.

Evolution then, if it is a theory at all, is not static; it is concerned with longer run dynamics. Competition shares this characteristic. It concerns entry and exit from markets, bankruptcy and takeover. It is a process rather than a state of affairs. An economic theory which stresses change is not however necessarily an evolutionary one in the sense outlined above. Evolution is more than the development of the future along a time path which is irreversible, though many passing references in economics seem to use the term as if that were all it was. Rather it is a particular theory about what that path is. Economics contains a series of theories of the process of competition. In the next chapter, on antecedents, I will examine some of these views of competition; in particular those associated with Schumpeter and the Austrians.

2.3 EXPLANATION AND PREDICTION

(i) Methodological pluralism

Maximising and non-maximising theories are different explanations of the same observed behaviour. The evolutionary defense of maximisation, one of the four defenses outlined in the introduction, from reduction or analogy, draws on a particular non-teleological method of explanation. Reasons for action in this method are not crucial to description, explanation or prediction. In evaluating an explanatory scheme for which there exists one or more coherent alternatives to cover the same observations, one or more criteria for deciding between the rivals are required. It is natural therefore to turn to the philosophy of science to provide them. These criteria, it must be understood, do not attempt to provide a complete account of the nature of explanation. That is far beyond the scope of the present undertaking. Rather I am concerned to lay down necessary conditions or hurdles, which the competing theories must meet and pass. They are not sufficient for explanation.

The first point to make here is that the criteria are pluralistic rather than singular, and in particular, I shall argue that empirical evidence does not uniquely, of itself, decide between two theories. This fundamental point can be established in two related ways: (i) from the Quine-Duhem thesis, and (ii) from considering the limitations associated with using any particular candidate for explaining a particular set of events. I shall consider both, and then discuss each criterion in turn. It should be stressed that if there were a single decisive criteria, such as empirical evidence, then the approach of this thesis would be invalid. As will be seen, it is doubtful whether evolutionary theory itself predicts

anything which can be measured decisively as a test. It is an amalgam of different assumptions, propositions and claims - about preferences, beliefs and the behaviour of firms - and these need to be separated out individually to decide whether they are acceptable. Evolutionary theory claims to predict that the fittest survive, but this is empty of empirical validity without some content being given as to what 'fit' actually means; in particular, fit for what [1]?

(ii) Indecisiveness of empirical evidence

When presented with an apparent case of empirical refutation, the relationship between theory and evidence needs to be examined. For it does not immediately follow that it is the theory which is at fault. All theories are simplifications, abstracting from complex reality. They are therefore not required to be compatible with the data to the extent of perfect matching. A useful theory is one that is sufficiently close to the data, while at the same time being general enough to be interesting. There is thus a trade-off. Some approximations are better than others; because complete realism is itself undesirable for causal explanation, it does not follow that the degree of divergence is irrelevant. The choice of one theory rather than another is not however uniquely a matter of empirical evidence, as has typically been assumed by positivists in philosophy and by some economists [2].

1 . Huxley (1893) first made this point.

2 . The most notable example here is Friedman (1953). Despite recent attempts to show him in the more favourable light of instrumentalism his methodology is profoundly positivistic, as I have argued elsewhere, in Helm (1984b).

I shall here advance a series of arguments directed against such an empiricist position, in order to show why the validity of utility maximisation in general, and enforced maximisation in particular cannot be decided empirically, although empirical evidence might assist in evaluation. I shall then argue that causality and what I shall call 'feasibility' also affect theory choice, before using these criteria to argue against the theory of enforced maximisation. I shall stress throughout that a good predictive theory does not necessarily constitute a good explanatory one [1].

There are a number of important points which bear upon the value of predictive testing. I shall focus on two related critiques of empiricism: that put forward separately by Duhem (1914) and Quine (1953) and known in the literature as the Quine-Duhem thesis, and that advanced by Hicks (1979) (1983) (1984).

(iii) The Quine-Duhem Thesis

The Quine-Duhem thesis concerns the relation between theory and evidence. Duhem, in considering whether 'crucial experiments' are in principle possible in physical sciences, asserted that when the scientist experiments, he is simultaneously testing a network of theories and hypotheses. Evidence for (confirmation or verification) or evidence against (refutation) counted against the network as a whole, rather than in

1. An example which may help to illustrate this point is as follows. The world's best billiard player normally makes shots which are close to the optimum. Therefore a good predictor of his play is to assume that he acts as if he knew the laws of motion, and calculated the optimum trajectory according to the relevant physical theories. That however would not constitute a good explanation of what he actually did.

a specifiable way against a particular member of the network.

Quine developed this thesis as part of his wider critique of empiricism, based on the "two dogmas of empiricism" which he identified: the analytical/synthetic distinction and the reduction of theoretical terms to empirical meanings. He premised the thesis on two claims. The first was that (p.42):

"The totality of our so-called knowledge or beliefs....is a man-made fabric which impinges on experience only along the edges. Or, to change the figure, total science is like a field of force whose boundary conditions are experience. A conflict with experience at the periphery occasions readjustments in the interior of the field. Truth values have to be redistributed over some of our statements. Re-evaluation of some statements entails re-evaluation of others because of their logical interconnections."

Theories involve a number of theoretical terms, logically interconnected [1]. The second claim is then that (p.43):

"No particular experiences are linked with any particular statements in the interior of the field, except indirectly through considerations of equilibrium affecting the field as a whole."

The scientist cannot separate out the theoretical term from the logical set of connections, and thus the thesis itself follows, that (p.43):

1. Quine here perceived theoretical terms as subject to the problems of connection and convention discussed in the philosophy of language. For a discussion of the theory of convention and language, see Evans and MacDowell (1976), Davidson (1984) and Lewis (1970), and with respect to beliefs, ch.5, p.224f below.

"Any statement can be held true come what may, if we make drastic enough adjustments elsewhere in the system....Conversely, by the same token, no statement is immune to revision."

Empirical evidence may act as an indicator that something is wrong from amongst the nest of hypotheses which are necessarily, because logically interconnected, being jointly tested. But it is not decisive; it does not indicate directly where the error lies. The thesis is open to a variety of criticisms, which will be briefly reviewed. But since its interpretation is somewhat unclear, let us first, following Lakatos (1970,p.184), distinguish two versions of it, a weak and strong claim.

Weak Claim.

The weak assertion is that it is impossible to target a specific empirical observation on a specific theoretical term. Science is not a unique relation, but rather plural. This is my position above. It follows that refutation in the cruder Popperian versions (see below) is not strictly admissable. It denies the possibility of an empirical disproof of any separate component of a theoretical system, but does not deny that empirical evidence is useful. It is an argument for a pluralistic methodology.

Strong Claim.

The stronger implication of the thesis is that there is no correct method of theory appraisal, with relation to empirical evidence. Empirical evidence is irrelevant in the sense that observations are not independent of theory.

Since the weaker version of the Quine-Duhem thesis permits some value to be attached to empirical information, in suggesting that existing theory is unsatisfactory, but is not in itself decisive, it is important to see whether the Quine claims are immune to the criticisms which have been levelled against it. These include distinguishing between refutation and verification (Popper(1934)), claiming that Quine's approach is holistic, and claiming that some hypotheses can be isolated, either because background conditions do in fact hold constant across rival hypotheses or because of the possibility of independent testing.

Popper (1934) has claimed that science can be demarcated from non-science by the criterion of falsifiability of hypotheses. Science, for Popper, proceeds by the method of conjectures and refutations, a method ruled out by Quine and Duhem. Popper claimed that scientists should, in forming their conjectures, rule out precisely the Quinian defense (1959). This is hardly satisfactory, since regardless of the motives of scientists the defense remained a logical possibility. By 1963, Popper accepted that many hypotheses were in fact ineluctably embedded in theoretical systems (p.238), though he still claimed that some cases could be rescued. To claim that some, but not all, could be tested and subject to refutation is a different objection, and one Popper has in common with Grunbaum (1960) in particular. This reply, while more plausible than the general objection, is itself very problematic. For we must ask whether the boundary between those which are and are not refutable is itself an empirical one or whether it can be logically stated. Popper himself is forced by this weaker objection to revise his demarcation principle. Neither method is convincing: the former because the thesis itself could be applied to the empirical distinction, and the latter because it remains to produce the

logical separation. If the demarcation is between whether background conditions remain constant, then the scientist must be able to simultaneously test the hypothesis under investigation, and all the background conditions. This may either be too demanding to actually do, or the experimenter may by intervening actually alter the very background conditions he wishes to hold constant [1]. In any event, the possibility of controlled experiments in economics and other social sciences is extremely limited [2].

The consequences of the weak version of the Quine-Duhem thesis are: (i) empirical evidence is insufficient in itself to decide between conflicting theories, and (ii) that theory construction may legitimately proceed in a plurality of different ways [3]. The weak version allows for a plurality of criteria, and to this end I outline and defend a series of criteria for economic explanation and theory appraisal. These include the specification of one or more causal mechanisms, consistency amongst theoretical arguments, the proposing of frameworks for the classification of raw data, the feasibility of assumptions with respect to human rationality and reasoning capacity, the provision of adequate micro-foundation for preferences and beliefs in particular, that a conception of rational behaviour is specified, and that the theory is reasonably data-compatible. Each of these is open to the claim that they are ad hoc, and therefore to avoid this, the rest of this section is

1 . See Hacking (1983)p.149f.

2.. Tax and market experiments in economics are notoriously hard to interpret. See Ferber & Hirsch (1982),esp. ch.3.

3. Strictly, I have only shown that the major singular candidate, the empirical criterion, is not sufficient.

devoted to outlining these criteria to be applied in criticism in chapters four, five and six. There is, it will be seen, little dispute about the data concerning preferences and beliefs; the disputes are all about interpretation.

(iv) Hicks' anti-empiricism

Related to the Quine-Duhem critique of empiricism in general is Hicks' specific critique of economic empiricism. This is based on two propositions. The first stems from the observation that economic theories are time-dependent. Economic institutions and behaviour alters with the passage of time, and the more characteristic problems are not static ones, but are "problems of change, of growth and retrogression, and of fluctuation" (1979, p.xi). It is for this reason that scientific methods are less applicable to economics, since in economics everything must be dated, whereas in science, Hicks' claims, this is not the case. At the level of actual human behaviour, what might be true in one period need not be true in another, even if the motives of the agents do not themselves alter. Furthermore, dynamic theories [1] of economic behaviour need to incorporate the passage of time into processes through the relations of participants in those processes to that change. Testing is then at best limited to periods when the relevant institutions and individual behaviour remains constant, and to what is going on in those periods.

Hicks' second objection focuses on the problems of prediction, and he

1. Hicks uses the term 'dynamics' in a particular way. See his (1956) for definitions.

claims that economics can make only weak predictions [1]. These weak predictions are claims about what will happen if other things remain the same. Since ceteris is almost never paribus, a particular set of observations can never, themselves, form the basis for testing an hypothesis.

(v) Causality

Hicks view on prediction derives from a prior view about causality. If prediction is insufficient to decide between theories, then other criteria are required. The most important characteristic of an explanation is that it isolate one or more causes. Economic theories frequently take the form of a specified list of assumptions and the deductions which can be obtained from them. Propositions are proposed and a minimum set of required premises stated, on the principle of Occam's razor [2]. As such they are only theorems; to provide an explanatory statement requires that two further steps be taken. These are the specification of a causal mechanism, and correspondence rules between the theoretical concepts of the theory and their empirical counterparts. A theory cannot be merely a deduction or an identity. It must be more than this. At minimum the premises of a deduction must reflect "approximately" the structure about which the theory purports to be an explanation. Thus an evolutionary explanation depends on a causal transmission mechanism between the source of variation (genetic mutations) and future individuals via reproduction. A

1. There are few if any explicit (strong) predictions in economics. Not even the 'law of demand' makes clear predictions: negatively sloped demand are predicted only on the joint-condition concerning the income effect.
- 2 . Occam's razor is the principle that unnecessary entities or characteristics which are not needed to derive a result are undesirable for explanation. Of two theories which derive the same results or predictions, the one which is contains less terms and assumptions is preferable.

description does not, of itself, constitute an explanation, unless it is constructed from a classification, and that classification is combined with a causal mechanism. To claim that an explanation requires a causal account is contentious with positivists, who typically tend to see causality not as a necessary connection between two events or states but only as essentially temporal ordering and contingency [1]. But what is more generally contentious is to claim a definition of what causality is. The discussion is thus restricted to a series of claims about necessary conditions for the ascription of causality.

The first point to note about causality naturally concerns temporal priority. Contrary to the Humean position, causality involves more than such a principle, though that principle may in itself be important. Certainly it lies at the heart of so-called "causality tests" such as those associated with Sims and Granger [2]. Deductive reasoning is not tied down to a time sequence, whereas economic explanation is always in time. Description can be static, and cross-sectional, at a point in time; or it can be dynamic, describing change through time-series. Causality requires appeal to factors prior to the period in question in most cases, though as Hicks (1979,p.18f.) points out, with respect to a period rather than a point of time, causality may be reciprocal or contemporaneous. It need not, strictly, be sequential, though in that normal sequential case, a causal explanation explains how particular variables translate themselves

1. This account of causality stems from Hume's justly famous section of his Treatise (1958, bk.1, ss.xiv, pp.155f.).

2. Granger(1969) and Sims(1972). See also Zellner(1979) for an appraisal. Granger & Newbold (1977, p.225) themselves acknowledge these tests to be only temporal relation tests.

through time into others. Thus a second component to causal explanation is required, explaining the mechanism of translation. It is not sufficient to discover a temporal regularity, such as for example between money and prices. A temporally ordered correlation does not of itself tell you why the causation runs from one direction to another, and thus how one variable translates itself into another. The Humean account of temporal priority can perhaps tell us when and where a correlation occurs, but there is no necessary connection for Hume (1958, p.155f). Thus causality is more restrictive: for A to be ascribed as the cause of B, one necessary condition is that a mechanism is proposed as to how A actually brings about B. These mechanisms in economic explanations will be tackled for enforced maximisation below, and in particular how reasons as beliefs and preferences may fulfill this criterion. A consequence of this further requirement is that causality is not equivalent to prediction, whereas it (almost) is so under the Humean account [1]. A theory can be causal without being predictive, since it may refer to a particular time period, or it simply may not be stateable in predictive terms [2]. A prediction may involve only temporal priority. Confusing the two will be seen to be particularly unhelpful in examining the evolutionary approach. The confusion stems from Hume's approach to epistemological problems, and his sense-data theory, and has been carried into modern positivistic thought,

1 . But see Mackie (1974) and Stroud (1977) on Hume. For a more generous account of Hume's theory of causation, see Beauchamp & Rosenberg (1981).

2 . This type of case arises when the general factors causing an outcome are known, but the content of the causes are unknown, or where the factor under consideration is surrounded by considerable numbers of other unknowns. A good example of both is the non-predictive theory of evolution. But see M. Williams (1973)(1982).

and into economics by Friedman in particular (1953) [1].

Temporal priority and causal mechanisms are important concepts in causal analysis. But the problem which is most troublesome to those of a positivistic persuasion [including besides Friedman, Blaug (1980) & Boland (1982)], and why it might be suspected that they neglect causality so completely, is that a causal explanation typically involves the specification of a counterfactual. Now the important point about a counterfactual is that it is theoretical and thus not observable. In evolutionary arguments, such a counterfactual is therefore also not observable, and thus what would have happened in the absence of genetic change cannot be expected to be discovered directly by empirical methods. Therefore, and most importantly, the efficiency of survivors cannot be observationally decided. A theory of what efficiency means is required, and maximisation if one such theory which will be criticised in chapters four, five and six. Comparisons may give some indication; for example geographical differentiated populations may be compared as Darwin did, but these will not be decisive. Counterfactuals are not, and here I differ from Hicks, in themselves decisive: the truth of a counterfactual is neither necessary nor sufficient for the truth of a causal statement [2]. The indecisiveness of counterfactuals arises in two ways: there may be a plurality of possible counterfactuals for a single causal claim, and secondly there may be epiphenomena present. Neither of these points however imply that counterfactual specification is not required.

1. See footnote 2, p.40.
2. Mackie (1974, ch.2).

Digression on the counterfactual definition of causality, and the relation between Hicks and Mackie

It has not as yet been noted in the literature that the counterfactual definition which Hicks has proposed is closely related to the definition of causality put forward in John Mackie's article "Causation and Conditionals" (1965), and later in his book "The Cement of the Universe" (1974; revised ed. 1980a) Mackie suggested that (1980a, p.xi):

"when we take A to be ... a partial cause of B, we can say that if A had not occurred, B would not; a cause is to be taken in this counterfactual sense necessary in the circumstances for B, though sometimes also sufficient in the circumstances as well, or perhaps only sufficient in the circumstance and not necessary: we have alternative counterfactual concepts of causation. But these counterfactual conditional relationships do not exhaust our concept of causation, for this concept includes also the notion of symmetry between cause and effect."

From this, Mackie's famous INUS condition for causality is that:

"an insufficient but necessary part of a condition which is itself unnecessary but sufficient for that result."

We can ascribe A to be the cause of a dated event E if A is an INUS condition for E.

Between this more formal definition, and that of Hicks, there is very little difference, except only in the question of unique sufficiency on a particular date (1).

1. As Sosa defines the difference: "The only significance is that if C is an INUS condition of E then C is an essential part of a condition that is

cont/

If causality were limited to INUS conditionality, then this would be the end of the matter [1]. The importance of causality arises after its counterfactual representation has been recognised, and recognised as a matter of theoretical rather than empirical epistemological status. It is the content of causes which matters.

There are different types of causes. One distinction is between weak or strong ones. Typically in economics quite a number of causes operate together to produce a particular effect. These may be considered to make up a vector, say $(a_1, \dots, a_n)$, producing the total effect, say B. Each component of the vector is a "weak cause" of B, in Hicksian terminology. Only if the vector is a single component vector will strong causality be present [2]. The dominance of weak causality in economics will be particularly important for our analysis of the reductionist evolutionary case, for that account assumes strong causality. The relationship between the component causes may either be separable or non-separable, and there is no a priori reason in economics to suppose that the former necessarily is cont/ uniquely sufficient for E on that occasion, whereas C may be ceteris paribus sufficient for E in circumstances when there are several sufficient conditions for E, including some that do not contain C as a part".

1. It should be noted in passing that the Granger "causality" concept, being limited to temporal relations (see footnote 2 , p.48), is not to be confused with the Mackie and Hicks conditionals, both of the latter admitting of the possibility that causality is not unidirectional. Furthermore, counterfactuals are theoretical assertions (and thus are non-observable) and thus cannot be "causality tested".

2. In biology, if behaviour is caused by teams of genes rather than individual genes, then each gene might be at best be regarded as a weak cause of that behaviour. Only with strong causality would one gene cause one type of behaviour.

the case in any particular example. Typically in Humean accounts of causality, and in the modern Granger and Sims tests, separability is assumed without justification being given. It might also be noted that, so long as the vector is multi-membered, prediction is also weak, since it depends on other components remaining constant. This point is close to the claims advanced in the Quine-Duhem thesis above.

(vi) Classification

In the previous section, the plurality of possible counterfactuals was emphasised. I claimed that explanation involves the ascription of a causal mechanism. There may be alternative possible methods of explaining the same data, and thus we now come to the question of how one alternative is chosen over another. The Quine-Duhem thesis was premised on the assumption that theories are interconnected and must be considered as wholes rather than individual hypotheses. These are effectively 'paradigms' or what Hicks' calls 'classifications'.

Constructing an economic explanation involves the organisation of an actual or potentially large set of data or facts. To an extent, the classification or description of the data is a matter of choice [1]. This choice occurs at two levels, one quite generally and the other more specific. Quite generally, the theorist works within what Hicks (1976b) has described as a set of blinkers, or as Schumpeter (1954) put it, a

1. The issue of whether this choice is value-laden has been much discussed. In economics, see Myrdal (1958) and Dobb (1973, ch.1) arguing for value ladenness, and Sen (1980) and (1981) disputing the contents of these specific claims. It should however be pointed out that there are a large number of ways in which value ladenness can arise, and the above tackle only a subset of these.

"vision" of how the economy works. This general choice of classification is in part determined by what is perceived to be the principal questions to which answers are sought, but it might also be influenced (though not exclusively so as Dobb (1973) would have us believe) by ideology. For example a pro-attitude towards the market might lead to emphasis being placed on the workings of the market mechanism, whereas a pro-attitude towards planning might lead elsewhere. The importance of this classificatory role of theory stems from our observation that in many areas of theory, the facts themselves are not in dispute. It is their interpretation that counts, and alternative classifications alter interpretations [1].

At the specific level, there are two classificatory problems: definitions and measurement. The setting up of a classificatory system requires a set of definitions, which are in part correspondence rules between theoretical terms and the data [2]. The definitions chosen can make a great deal of difference, of which National Income accounts are perhaps the classic example. More relevantly to enforced maximisation, altruism may be classified as enlightened self-interest, or alternatively as an act from non-consequentialist considerations, as will be seen in chapter four below. The crucial question is which of a large, or possibly infinite number of classifications is to be chosen. Whether this is a matter of value-free choice or some other subjective choice rule depends on whether there are objective grounds for deciding between theories. The

1 . Hicks has claimed that Kuhnian paradigms are effectively alternative classifications.

2 . For example data on money is classified in terms of the theoretical concept; similarly for costs and income.

classification must be appropriate to the problem at hand (Hicks 1976), but there may be a plurality of possible explanations, in the sense of a vector of weak causes.

(vii) Feasibility

One of the most important criteria, to which I shall repeatedly refer, is that of feasibility. To the extent that models of human behaviour attempt to explain the framework of choice, the choice-outcomes of the model should be consistent with what people are actually capable of. In particular, attention should be directed towards computational ability, costs of information search and processing, and the information in principle available. There is therefore a relationship between motives and mental states on the one hand, and choice on the other. Models based upon assumptions disregarding this relation, such as that individuals act 'as-if' they knew the true structure of the economy, are unsatisfactory on this criterion, as will be demonstrated in the discussion of rational expectations (enforced expectations) in chapter five, since they do not explain causally how people could come to hold this information set.

This criterion, as stated here, takes a particular view of the "assumptions debate" literature of the 1940's onwards, concerning their realism with respect to the limitations of mental capacity. As I have argued above and elsewhere (Helm 1984b), since empirical evidence does not of itself decide between theories, and since the "assumptions debate" disregards the role of causality, these components of theories need careful scrutiny. The feasibility criterion is one such check. I now discuss the way in which mental ability and reasoning enters explanation.

(viii) Rationality and consistency

There are many accounts of what it means to claim that an act is rational. Economists have generally agreed that rational behaviour implies that a well-ordered preference function is consistently maximised [1]. Appropriately ordered preferences and beliefs are combined to select the maximal outcome of a given set of choices. This notion of rationality makes both descriptive claims, concerning the nature of preferences and beliefs, and the motivational claims, concerning the aims of individuals.

To explain the behaviour of human beings, I argued above that account must be taken of the purposeful or teleological nature of action. Motives must be taken into account in explanation. I am therefore rejecting any attempt to reduce motives to something else - in particular to actions (as behaviouralists attempt) or to neurological changes (as physicalists do). People have reasons for their actions, and these partially determine their actions. In a wider sense than the traditional economists' conception of rationality, I shall now argue that these reasons are partial causes of actions, and that the maximising utility account is a special case, admitting of only one type of cause, one type of reasoning. A more pluralist appraisal of rationality will be proposed, deriving from different types of reasons. In chapters four and five some specific types of reasons will be discussed.

Davidson (1963)(1980), in trying to explain how a reason rationalises an action, argued that it is necessary and sufficient that it can serve, at least in essential outline, as a "primary reason" for that act. Such a

1. Becker (1962) for example claims that this is universally accepted.

reason can be defined as follows (1980, p.5):

"R is a primary reason why an agent performed the action A under the description d only if R consists of a pro attitude of the agent towards actions with a certain property, and a belief of the agent that A, under the description d, has that property."

Davidson then asserts that "a primary reason for an action is its cause" [1]. This notion of causes for actions is of considerable use to our argument. 'Pro attitudes' may be interpreted in a variety of manners, including desires and wants on the one hand, and goals, moral ends and the like on the other. Beliefs may be correct or incorrect, and remain part of a causal account [2]. But the psychology of individuals and the procedure by which they go about making decisions become relevant in this framework to the explanation of actions.

The Davidson account is a development of Hume's position concerning the relationship between reasons and desire. It was Hume who argued that "reason is and ought only to be the slave of the passions, and never pretend to any other office than to serve and obey them"(1958, p.415). (3) Davidson is not however so restrictive, and we need not be committed to so

1. *ibid*,p.4. It should be noted that placing emphasis on reasons as causes downgrades the principle of predicting and predictive testing, since reasons typically cannot be observed. See against Davidson, Hempel & Oppenheim (1953).

2. See Watkins (1970),pp.168-71, in his discussion of the Collingwood thesis concerning historical explanation.

3. The Hume position, of subordination of reason to passions, is an instrumental one. It remains to be shown what are the determinants of passions (wants and preferences in economists' language). If these can be reduced to biological causes, the functional rather than teleological account of behaviour is vindicated.

strong a subordination of reason. For Hume, human nature was fundamentally a constitution of passions, and in his Treatise he argued that man's nature remains constant [1]. I am however are putting forward a more pliable argument; that preferences and beliefs alter, and that there may be interdependence between the two.

Reasons for action include both beliefs and preferences. However in order to qualify as a primary reason, a motivational postulate is required to translate these preferences and beliefs into actions. The choice of postulate or postulates is however not simple, nor is it uncontentious as economists are prone to believe. Two criteria must be met. The first is that of feasibility, and the second is causality, both of which have already been discussed generally and specifically with respect to reasons. The reasons must be specified and be causally relevant. The maximising account of rationality violates both of these criteria, and most clearly in the appeal to 'enforced maximisation'. This appeal, the topic of this thesis, is, it will be argued, neither feasible nor causally relevant to human action.

It must of course be admitted that I have taken here a particular view of rationality as a criterion, about which there is both a considerable literature and considerable controversy. Rationality is often thought to be an absolute criterion of correct or incorrect judgement; that is not the view taken here. Reasons for action (beliefs, preferences and motivation) frequently are in some respect wrong by such an absolute criterion, since beliefs and preferences may be inconsistent, or are insufficient

1. See discussion in ch.4, section 4.6 below

informationally to dictate the rational course of action. Some reasons may be better than others; but that does not make them better causal explanations of activities. Beliefs and preferences are diverse and pluralistic in origin. The motivation for translation into action must permit of a variety of alternatives to self-interest. In particular I shall argue that an account of altruism is required. Furthermore the possibility of indeterminacy of beliefs and preferences needs to be admitted. Just as a set of preferences and beliefs lead to more than one possible potential action, they also may in principle be an indeterminacy in the causal explanation of action.

Rationality need not be singular; there may be many kinds of reason. The strong desire which writers have entertained since the Enlightenment [1] to discover singular reductionist foundations which may act as minimum descriptions of human nature, and upon which everything else can be constructed, is here resisted. Reasons are causes of actions and thus a criterion of explanation of human behaviour is that an adequate account of them is provided. Such an account is likely to be pluralistic. The maximisation of utility account assumes a particular representation of preferences within a utility function, and at least a probabilistic account of beliefs. These claims will be investigated according to their causal efficacy in chapters four and five below. It follows that it is not here assumed that maximisation is tautologically true, though it may be a

1. This distinction between singular and pluralistic approaches has formed a central theme in the work of Isaiah Berlin. See especially his (1981) collection. However, Berlin describes the singular view as rationalistic, whereas I prefer to employ a wider notion of rationality so that reason may also be applied to pluralistic foundations. This kind of distinction is also discussed in Hayek (1967) ch.5.

central heuristic [1].

The Davidson account stresses the importance of mental states in causing behaviour. It leaves open the question as to whether these mental states are directed towards the consequences of action, to the value of the act independent of their consequences, or towards bringing about ideal mental states [2] regardless of their connection with action. If people can choose that which they attach value to, then whichever of these three alternatives demand subjectively their attention will affect their behaviour. In particular, should a choice be available between two acts A and B, with consequences A* and B*, and associated mental states a* and b*, then whether A or B is chosen is explained in part by whether for that individual $a^* P b^*$ or $A P B$ or $A^* P B^*$. Choosing for example B over A may be caused by a preference for b* over a*, even if $A^* P B^*$ [3].

The relevance of these distinctions comes out in chapter four in discussing utility, and in particular with respect to consequentialism. For the theory of enforced maximisation is I shall argue a consequentialist theory, and predicts that acts are selected according to their consequences (A*,B* in our example). People choosing on the basis of a*,b* or A,B should systematically make mistakes if these diverge in evaluation from A*,B*. Thus to view choice, moral or otherwise, according to non-consequentialist calculations can only be successful in the marketplace if all three levels of evaluation coincide. There are, it will be shown,

1. Contrary to Becker(1976) and Boland(1981).

2. See Moore (1903) esp.ch.6.

3. Another alternative possibility is that the choice is over the 3-tuple, $(A^*,a^*,A) P (B^*,b^*,B)$.

good reasons for supposing that they do not. Of course the definition of the marketplace matters: only in the presence of competition can appropriate selection take place, and the type of competition affects the outcome.

2.4 COMPONENTS OF ECONOMIC EXPLANATIONS

In the previous section, I argued that economic theories are typically deductively constructed using a series of assumptions or axioms, and suggested criteria for their selection. One neglected point in that discussion is that the validity of assumptions depends on the subject matter which the theory attempts to explain. A behavioural economic theory consists of a series of components about which assumptions are made, and in this thesis these will be criticised not in principle as the methodological literature has tended to do, but according to their subject matter. I distinguish between individuals and institutions since competition and selection mechanisms impinge on individuals qua individuals, and on individuals qua members of institutions, the most important of which for the economist, are firms.

Once the components of economic explanations have been discussed, the next chapter considers the antecedent theoretical background of these components primarily from the history of economic thought, and then in the main body of the thesis, chapters four, five and six, the ways in which competition and selection effect each are appraised.

(i) Preferences

The first basic component of an economic explanation is the preference set. There are two broad approaches to theorising about them. The first is to treat them as exogenous, and is the method most frequently employed in economics. The second is to attempt to provide an explanation of their content, and how they might change. Let us briefly look at these two alternatives by way of introduction to chapter four.

Economists typically not only regard preferences as exogenous but tend also to dismiss their content and concentrate on their consistency. In the ordinalist approach, which is considered most thoroughly in this thesis for reasons discussed above with respect to empiricism, axioms of choice such as transitivity, completeness, reflexivity, continuity and so on, are imposed on preferences to guarantee consistency. Typically the treatment of preferences is static. All goods are dated and assumed unique to their respective dates. If the passage of time is permitted, then preferences are assumed to be constant, so that consistency is maintained over periods. In either case, preferences are the same, whereas goods may change from the subjective viewpoint of the consumer. The constancy of tastes over time is a fundamental assumption of the preference foundation of an economic explanation. It may hold even if preferences turn out to be endogenous, though it is less likely in that case.

In the literature there are a variety of attempts to modify this traditional presentation, and move towards a more explanatory theory. A first step in this direction was taken by Lancaster (1971), who argued that the objects towards which tastes are directed are the characteristics which goods possess, not the goods themselves. The demand for characteristics is the factor which remains constant with respect to a preference ordering, not preferences for goods at the superficial level.

While it is important for an economic explanation to get the level of choice and preference correct, deeper theories are argued in this thesis to be required. In chapter four, not only is it argued that preferences are best considered endogenously, but I also consider one of the endogeneity explanations which has been suggested. Becker (1976) has offered a

sociobiological explanation of why preferences must take the form they do, why they must be self-interested, and with Stigler (1977), why they can be considered constant even though partially endogenous. These articles are not completely consistent with each other as will be seen, but they do provide not only a theory of preference formation, but also one that relies of competitive selection. I will argue that the claims of enforced maximisation require an adequate account of the preferences, their formation and change, that this in the sociobiological case is unsatisfactory, and therefore that enforced maximisation as a theory of preferences fails both in itself, and as a non-teleological attempt at explanation.

(ii) Beliefs

The second basic component of a behavioural economic explanation is a theory of beliefs. And just as the evolutionary argument has been used to give an account of preference formation, so also has it been used in the case of beliefs. Maximising beliefs are argued in chapter five to be rational expectations; they can be assumed to represent individuals' mental states on the argument that they are maximising beliefs, formed in a maximising way. Furthermore it can be assumed, on the rational expectations arguments of Muth (1961) at least, that everyone holds them, since not to do so would give rise to a potential profit. A rational agent could exploit the arbitrage possibility of non-maximisers. Criticising and defeating this enforced maximisation argument for our second component of an economic explanation will occupy chapter five.

But by way of introduction to chapter five, let us consider the components of the traditional explanation of beliefs, and their

consistency. For, with the notably exception of rational expectations and its rather primitive predecessor of adaptive expectations, economists have been less concerned with the content of beliefs than with their consistency, mirroring the discussion of preferences. The subjective expected utility maximising model is in this class of models. It is not concerned with belief-content, only the necessary axioms for consistency at a point in time, and consistent revision. The beliefs themselves, like subjective preferences, are typically assumed exogenous. Axioms of probability are imposed; the assumption being that all judgements under uncertainty can be represented by probability numbers. By way of contrast, in chapter five it is argued that there are many different types of uncertainty concerning different types of information and states of the world. It is argued there that the mathematical theory of probability can have more than one semantic representation, and that it does not cover all of uncertainty space. But not only is a theory of belief content required, but also of belief revision in the light of new information. This has two components: (i) a theory of information search; and (ii) a theory of belief-revision in the light of information gained under (i). At best the traditional explanation of revision according to Bayes Rule is a theory of what a consistent individual would do. There is here no theory of belief-content.

The purpose of chapter five is then to resist the traditional account of beliefs as inadequate, and in particular to show why the beliefs that agents have cannot be described as rational expectations. Hence the enforced maximisation theory of beliefs fails. Constructively, since beliefs count as reasons for action, a richer theory of their content, formation and revision needs to be created along the lines of a recognition

of the limited processing capacity of the human brain, and at least some non-probabilistic uncertainty.

(iii) Institutions

The reasons for action discussed under the headings of preferences and beliefs are partial causes of behaviour. Institutions are the structures and hence constraints within which they take place. Thus a further basic component of an economic explanation is an adequate account of institutions, both their nature and their change over time.

Production rarely takes place in isolation. It usually requires organisation, which takes the form of firms. Firms exist in part because of the existence of scale economies of cooperation [1]. Households, within which much production also takes place [2], may also be thought of as firms. Competition and selection impinges on individuals both as individuals, and as members of firms. An economic explanation must therefore incorporate an adequate account of firm behaviour.

Market efficiency and enforced maximisation depend on the firm's decisions; but these decisions are made by at least some of the individuals who make up the firm. The way in which these individuals influence outcomes depends on two important and much discussed factors: control and ownership. As will be seen in chapter six, neither of these concepts are very clearly dealt with in the enforcement literature. Control is frequently confused with power and with the legal status of the firm.

1 . See Coase (1937) and ch.6, section 6.4 below.

2 . See Becker's discussion of household production functions in his (1982) ch.2.

Broadly speaking this problem can be approached either by considering the firm as a set of property rights, or the firm as a series of interlocking contracts. The former concentrates on the conflict between the desire for profit and wealth by owners, and managers ability to maximise their own utility functions. The latter, the agency literature, considers the corporate market to be an efficient one in which well-informed managerial teams compete for control over corporate assets and hence profit maximise. In both, the conflict between profit and utility maximisation remains.

To the extent that selection operates on firms, and only indirectly on the individuals that make them up, enforced maximisation stands or falls on whether or not it provides an adequate explanation of firm behaviour. The central contention of chapter six is that it does not. But before we come onto our basic components of economic explanation, let us consider some antecedents.

CHAPTER THREE: ANTECEDENTS: Self-interest, domain, economic
competition & sociobiology

"We need to know the history of our concepts in order to know what it is that we are handling" Hicks (1974),p.308.

The tangency between evolutionary theory and the theory of economic competition has a considerable history. But more important for my argument are the origins of the antecedent concepts which might be brought under either the reduction or the analogy relationship between the two subjects. For the theory of enforced maximisation, three such antecedents are important. These are the extent to which behaviour is self-interested, the domain or scope of economic competition to enforce maximisation, and the nature of the competitive process. Each has associated difficulties, relating respectively to the object of maximisation, the extent of maximisation, and to the time period over which maximisation takes place. No attempt is made to present a balanced appraisal of writers to which I shall refer, except in as far as they bear upon these issues.

Self-interest has a variety of possible interpretations, including narrow self-centred behaviour (what might be called "selfish" behaviour) and wider self-regarding behaviour, which may include within our own pleasure and happiness the welfare of others. The classical discussion of the conflict between these two is that given by Adam Smith. In considering his contribution, I assess the supposed conflict between the Wealth of

Nations [WN] and The Theory of Moral Sentiments [TMS].

The domain of economic competition has been another area of dispute. Two opposing views are represented by, on the one hand, writers such as Mill who argued that "economic man" is a sub-set of behavioural types, and on the other economic "imperialists" who believed in the universalisability of the narrow format of economic maximising. Exchange and scarcity on the one hand, and self-interest on the other have been separately used to delimit the economic domain: but used jointly by Becker, they justify universalisation or economic imperialism for him. A further set of "imperialists" are a group of sociobiologists who claim the all human behaviour falls ultimately within the domain of genetic causes.

The third area of dispute concerns the nature of economic competition; whether its outcome is a maximising one or whether its results are imperfect. Within that question is the issue of the period over which its efficiency is to be judged - the long and short run conflict.

Each of these three - self-interest, domain and competition - will form the principal sections of this chapter. I shall however preface these with a note on the historical co-development of biology and economics, which forms the next section.

3.1. BIOLOGY AND ECONOMICS.

The explicit relationships in the history of economic thought with the biological sciences begin with the beginnings of evolutionary theory. Darwin acknowledges (somewhat inaccurately [1]) his debt to Malthus:

"In October 1838, that is, fifteen months after I had begun my systematic inquiry, I happened to read for amusement "Malthus on Population", and being well prepared to appreciate the struggle for existence which everywhere goes on, from long-continued observation of the habits of animals and plants, it struck me at once that under these circumstances favourable variations would tend to be preserved, and unfavourable ones to be destroyed. The result of this would be the formation of a new species. Here, then, I had at last got a theory by which to work."

Wallace also admits that the idea of natural selection arose from reading Malthus on population [2]. The Malthusian check on the population's geometric growth, and the struggle for limited food expanding in supply at best at an arithmetic rate, closely parallels Darwin's insight into competition and selection. Mutation (the source of variation) and replication (its transmission) had to be added. However, Malthus himself got his own theory, or at least the inspiration for it, as he acknowledges

1. Darwin (1974,p.71). See also the references to Malthus in Darwin (1868), vol.1, p.10. But as De Beer (1965,p.303 & 1974) points out, Darwin in fact did not read Darwin on this date, and Malthus' influence when compared to that of Lyell, the geologist, on Darwin is much overrated. See also Oldroyd (1980,pp.61-72).

2. Wallace (1905,p.232) claims that Malthus' book was perhaps the most important book he ever read. See Heilbroner (1969) ch.4 for a discussion of the impact of Malthus' on the general world of ideas.

in his essay, from a biologist, one Dr. Franklin [1]. What is interesting, in addition to this interrelation, is that appeal to the principles of mechanics and of physics was not the model.

The influence of Darwin, and the great nineteenth century debate between the evolutionists and the creationists, naturally affected the then smaller circle of academics. It could not be avoided. Marshall explicitly stated his view that economic theory should model itself on biology, though he was less clear how this was to be affected [2]. The philosophy of Social Darwinianism had its impact on both the political stage, and on economists [3].

In economics, biologically inspired theories have surfaced irregularly; in particular in the theories of cycles and the long run [Schumpeter (1934,1954)], preferences and self-interest [Becker (1976a)(1976b)] and in discussions concerning the postulates and competitive framework of the theory of the firm. In the 1950s, there were a series of articles on evolution and the firm, notably by Alchian (1950), Penrose (1952) and Enke (1953)[4]. In the 1960s and 1970s, Winter

1. In the first edition, Malthus claims to have read only four authors on population - Hume, Smith, Robert Wallace & Richard Price. However he had in fact read Benjamin Franklin's 1761 pamphlet (originally published in 1751). See on this Petersen (1979), pp.60-61.

2. See Marshall(1898), and the quite numerous references to biology in his Principles. For discussion of Marshall's views on this see Hirschleifer(1977), Fao (1982) & Levine (1983). Levine explains the confusion in Marshall's analogy between evolution, dynamics and competition with regard especially to the theory of the firm.

3. See Hofstadter(1955) and Oldroyd (1980) ch.16.

4. This literature is surveyed more extensively below in chapter six, section 6.3.

(1964,1971) and Nelson & Winter (1982a, 1982b) tried to model firm behaviour by selection procedures. More directly, the recent debate on sociobiology, focusing on and developing from Wilson (1975), has rekindled interest in the nature of preferences, and in what Wilson has described as the central problem of sociobiology - accounting for altruistic behaviour - which at least apparantly might be thought of as reducing genetic fitness. In economics, the theorist most associated with this problem is again Becker (1976a, 1981).

Despite the apparent richness of this literature, it lacks coherence and consistency in its application to economics. There is no recognised evolutionary theory of preferences, beliefs or the firm. Economists have frequently taken evolutionary arguments, assumed them to have a particular implication for their argument, and applied them. Evolution has been treated as a process of change, without restricting it to a particular causal mechanism. Neither the validity of the theory, nor the justification for its employment have been properly discussed.

3.2 SELF-INTEREST

(i) Demarcation and the content of preferences

One of the dividing lines between traditional political economy and modern economics lies in what each take to be exogenous to explanation [1]. The Classical writers were typically concerned not only with the state, matters of politics and government, but also with the constituents of human nature. The term 'moral sciences' was to include such a conception [2]. Modern economists typically take preferences (wants, desires, needs) as given and exogenous to explanations. That is the demarcation principle. Furthermore, the consistent pursuit of self-interest is frequently taken to be a definition of rationality [3]. The classical economists did not, and in that regard investigated and propounded theories about human nature. Whether or not humans are naturally self-interested was a subject of inquiry, and not of assumption.

The further typical modern assumption is constancy of preferences which guarantees transitivity over time, if it exists at a point in time. Constancy of human nature, which includes preferences, is a claim which is

1. Schumpeter(1934,pp.4-5) summarises the methodological importance of exogeneity as a demarcation principle. He writes: "When we succeed in finding a definite causal relation between two phenomena, our problem is solved if the one which plays the 'causal' role is non-economic. We have then accomplished what we, as economists, are capable of in the question, and we must give place to other disciplines". See also Hirschman (1982,p.9f).

2. See for a discussion of the use of that term by Sidgwick and Marshall, Skidelsky (1983), ch.1-3.

3. Sen (1982b,p.5).

not new. Hume [1] is quite emphatic on this issue:

"It is universally acknowledged that there is a great uniformity among the actions of men, in all nations and ages, and that human nature remains still the same, in its principles and operations. The same motives always produce the same actions: The same events follow from the same causes....Mankind are so much the same in all times and places that history informs us of nothing new or strange in this particular."

For Hume, the 'passions' dominated reason: "reason is the slave of the passions". But the passions, being what human nature consisted in, are constant. That theory of mind is essentially the one which has passed on to modern economics. Preferences are constant and consistent; reason selects acts which generate the maximum amount of satisfaction available to meet those constant tastes.

Other classical economists went further and attempted to examine the nature of those preferences, and to whom they referred. Mill in particular paid considerable attention to psychology [2]. In general however self-interest in a broad sense was, and has subsequently been, assumed in economic behaviour, but not necessarily in other domains. Yet the problem of the meaning and interpretation of altruism has received various treatments; with regard to specific individuals and to society in general. The motivation of reason has been seen as crucial to the functioning of the market. The consequences of self-interested behaviour may be intended or -----

1. Hume (1975),section 8(1),65,p.83.

2 . See Mill (1843), esp.Bk.6,ch.4. In criticism see Popper (1957,p.152f) who regarded what he called Mill's "psychologism" as illegitimate.

unintended; but it has been of considerable interest to explain the apparent paradox [1] that self-interest could produce the social optimum. It might more naturally and intuitively be thought that co-operation, co-ordination, self-sacrifice and planning in market transactions might be more conducive to the social optimum. The concern of the 'moral scientists' of the nineteenth century was premised on the belief that people could and should choose actions which were right in the sense of benefiting society. The central role credited to moral education assumed not only that preferences could be altered, but also a range of alternative preferences which people took into account in choosing their actions. There was little emphasis on the existence of constraints on possible moral reasons, or that selection would necessarily favour self-interest. The growth of culture and affluence freed mankind from the pursuit of 'lower' pleasures and narrow self-interest.

Self-interest remained however a force to be reckoned with, but most writers from Adam Smith onwards have felt the need to temper its extremes. Adam Smith (1976, pp.26-7) may have argued that:

"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, never talk to them of our own necessities but of their advantages."

Nevertheless he saw that (TMS, pp.124-5):

1 . See preface to Arrow & Hahn (1971), quoted below, p. 33 . The paradoxes of hedonism are discussed in chapter four, section 4.5.

"society cannot subsist among those who are at all times ready to hurt and injure one another."

Marshall, one of the 'moral scientists', argued that self-interest was not the sole motive of action. Man had moral sentiments which temper his actions, and that a minimum moral code consisting of some degree of honesty and trust was required to sustain a market system [1]. Both short-run and utilitarian choices reduced longer-run rewards. In the Principles (1920, p.17), Marshall compared the goodness of acts in the following terms:

"What makes one course of action better than another, will not necessarily be a selfish gain, nor any material gain; and it will often have been argued that 'though this or that plan saved a little trouble or a little money, yet it was not fair to others', and 'it made one look mean'."

Marshall also tried to distinguish between self-interest in business life and altruism in the private life of an individual. Thus not only was there a question of whose interest should be included amongst the reasons for action, but also where the act took place, its domain [2]. Money for Marshall is a means³]; the goodness of an action depends on the ends towards

1 . Marshall (1920,p.19) states that "even the most purely business relations of life assume honesty and good faith.

2. Such a view will be found to have parallels in modern biological theories of altruistic behaviour as between families and societies in chapter 4 below.

3. Marshall (1920) p.18: "Money is a means towards ends, and if the ends are noble, the desire for the means is not ignoble. The lad who works hard and saves all he can, in order to be able to pay his way afterwards at a University, is eager for money; but his eagerness is not ignoble. In short, money is general purchasing power, and is sought as a means to all kinds of ends, high as well as low, spiritual as well as material". As

cont/

which it is directed . The distinction between private and public self-interest, between economic motives and others in different domains goes back to Adam Smith, and has been represented as the maximisation of a split-utility function between the two domains by Margolis (1982). Such a view has not gone unchallenged; it fails both because of the inability to provide persuasive reasons why behaviour can in fact be separated by domain, and how in principle it could. There are, as will be seen below (chapter four, section 4.5), great difficulties in maximising multi-membered vectors of goals.

A specific twist to the argument concerning self-interest was introduced by Edgeworth [1]. While self-interest may not be universal to all domains of human behaviour, nevertheless in some domains, he argued, it is. Edgeworth thought it intuitively obvious that the pursuit of self-interest be identifiable as a characteristic of human nature at the individual level, and by profit at the firm. The end of human action is not only to be restricted to the satisfaction of desires, in terms of wealth, but to narrow, self-regarding utility. He wrote (1881,p.52) [2]:

 well as the obvious flaw in this argument, concerning the consequences of the activity of accumulating money, in terms of the possible exploitation and harm to others which might arise, Matthews (1981) has discussed how values in economic and non-economic activities will affect each other, for better or worse. On this see p 190f.below.

1 . See for discussion, Sen (1977) (1983a).

2 . The question of whether economic analysis could be extended to war was a matter of some dispute. If economics is concerned with selfinterest, then such an extension is plausible only if the pursuit of individual self-interest leads to national military aggregate interest. But for those who believed that economics was concerned with the creation of wealth, war involved the negation of economic concerns. As Cannan wrote, the Political Economy of War is "a contradiction in terms" (p.49), quoted in Robbins (1932,p.7).

"But, even admitting a disposition in the purer wills and clearer intellects to accept the first as finis litium, and the useful as the definition of the first; admitting that there exists in the higher parts of human nature a tendency towards and feeling after utilitarian institutions; could we seriously suppose that these moral considerations were relevant to war and trade; could eradicate the 'controlless core' of human selfishness, or exercise an appreciable force in comparison with the impulse of self-interest. It would have to be first shown the interest of all is the interest of each, an illusion to which the ambiguous language of Mill and perhaps Bentham, may have lent some countenance but which is forever dispelled by the masterly analyses of Mr. Sidgwick. Mr. Sidgwick acknowledges two supreme principles in Egoism and Utilitarianism; of independent authority, conflicting dictates; irreconcilable, unless indeed by religion."

Edgeworth is of course quite correct in agreeing with Sidgwick that the pursuit will not necessarily lead to the attainment of their common interest, though perhaps not for the reasons that Sidgwick advanced. For unless the group is quite small or unless there is some form of coercion to make individuals act in their common interest, rather than their individual-regarding self-interest, rational self-interested agents will frequently have incentives to act contrary to that required for the maximisation of their common interest. A co-ordinator is needed to set prices, and an enforcement mechanism to avoid free-riding.

Interestingly Edgeworth's utilitarianism led to his needing to explain why the principle of diminishing marginal utility of money did not imply an

egalitarian conclusion. While for any individual the principle applied, it also applied across individuals who were dissimilar. Any particular individual's nature obeyed the principle; it was just that these individuals varied. Thus some individuals needed more than others to attain the same level of utility. From whence these inequalities came was, for Edgeworth, the outcome of an evolutionary selection process [1]. The problem here is that if human nature can be changed by evolution, either directly or by altering custom, habits and social institutions, then a particular reason must be provided as to why one motive - self-interest - remains constant while others do not. None is provided by Edgeworth.

A plausible argument could be constructed to suggest that historically the restraints on self-interest were perhaps stronger than now. Their strength has certainly varied; in particular the dominance of religious sentiment, with typically a specifically altruistic (if limited) non-consequentialist code [2]. Materialism is, contrary to the constant human nature assumption, a more recent phenomena [3]. Though notions of fairness influence behaviour, concern over for example the "just price" [4], and the illegitimacy of "usury" are not now as powerful as they once were.

1 . Hicks (1984c, p.171).

2 . See on this Tawney (1938) where it is argued that materialism, thrift and private concerns are related in the Protestant work ethic.

3 . For an historical study of a less materialistic conception of life, see Morrison's (1983) interesting study of the medieval mind. In particular note the discussion of the motives for donations to monasteries and burial. See also Thomas (1971).

4 . See Blaug (1978,p.30).

(ii) Smith's conception of self-interest & the paradoxes of hedonism

The ideas of Smith, Marshall and Edgeworth concerning the motive of economic behaviour provide a scope of self-interest . The discussion by Smith is perhaps the most illuminating for our purposes. The equation of self-interest and economic rationality is indeed to be found in Adam Smith's concept of the 'invisible hand' [1], and in this early idea is to be found one of the major difficulties. If the domain of economics is to be decided by selection of an appropriate goal or end of action, it may be required that that end, if pursued by agents in the domain, would lead to the results that may be claimed for it. For Edgeworth the claim was that the pursuit of self-interest was a fact of human nature, and that as a first step to altering this behaviour it would have to be proved that more could be gained for all, as individual recipients, by pursuing alternative . social ends. To Smith, the ideas of laissez-faire and the invisible hand may be seen as being the belief, or indeed the theory, that there exists a dynamic logic to the operation of the economic system as a whole [2]. He states the argument as follows, in the context of stating his case against mercantilism (1976,p.456)[3]:

"As every individual, therefore, endeavours as much as he can both to
employ his capital in the support of domestick industry, and so to

1. A denial of this equating of self-interest and economic rationality is to be found in Sen (1983a).

2 . Viner (1929) ably demonstrates that this view is not tied to any particular approach - he argues Smith's work is quite compatible for example with socialistic approaches. See also Sen (1983a). The concept of 'economic man' is more than a segregation of the economic domain: it is a vision of a certain type of society. It is a philosophy in the broad sense, and as Dr.Johnson wrote: "There is nothing which requires more to be illustrated by philosophy than trade does."

3. This is a classic piece of 'as-if' or indirect reasoning.

direct that industry that its produce may be of the greatest value; every individual necessarily labours to render the annual revenue of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. By preferring the support of domestick to that of foreign industry, he intends only his own security; but by directing that industry in such a manner as its produce may be of greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was not part of his intention."

Smith here (i) equates individual and general interest as equivalent, and (ii) claims that the latter may be unknowingly pursued by the pursuit of the former. However, this equation is not quite clear; he states that the relation is 'necessary', but then does not go on to the point of saying that all cases are of this type. Behind this view is a dynamic theory of competition, based on two principles: accumulation and regulation. Self-interest leads to accumulation; accumulation increases the demand for labour, wages rise above subsistence level, population rises (higher wages reduce infant mortality), and hence the wage is competed downwards. The stationary state is staved off only as long as the process continues keeping wages ahead of supply of labour. Indeed, as Sen (1983a, p.4) has pointed out:

"The Smithian argument partly rests precisely on the ability of the market to achieve the results intended by individuals, i.e. to fulfill the 'designs' of the participants - and then some more."

It is important to note these doubts which Smith had about the relation,

for if it were universal, then he could not have held that there did not exist a natural 'harmony of interests' among the various social classes. Conflict is crucial to the outcome. As Sowell (1974,p.17) pointed out, the classical economists who adhered to the laissez-faire doctrine based it on the hope and belief that conflict - economic competition - within a suitable institutional framework would lead to the best allocation of resources. Smith argued not that 'benevolence' but 'their own interest' would cause people to serve each other. His attitude towards altruistic behaviour and the public good is indeed rather negative; it is for him inferior to self-interest in the pursuit of the public good (p.456):

"By pursuing his own self-interest he frequently promotes that of the society more effectively than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good. It is an affectation, indeed, not very common among merchants, and very few words need to be employed in dissuading them from it."

Discussions of Smith have frequently focused on the supposed contradictions between the workings of the invisible hand tending to lead the individual "to promote the end which was no part of his intention" in WN and his other great work, TMS. If it is to be argued, as it has been that the two are not in conflict, then they must refer to different areas of human experience [1] or moral sentiments must have a selective

1 . Coase (1976,p.543) argues that "The TMS is a study of human psychology. The W.of N. is a study of the organisation of economic life. A harmony in human nature does not imply that no government action is required to achieve the appropriate institutional structure of economic life." Coase therefore (p.541) could "find no essential difference between the views on human nature in TMS and those expressed in WN."

explanation [1]. In TMS welfare is defined more in terms of the quality of life attainable [2], where the notion of 'quality' refers to a level of moral experience greater than that involved in the "mercenary exchange of good offices according to an agreed valuation" [3].

Conflict, competition and self-interest determine the economic domain. Now supposing that this separation of the economic domain from the moral is possible, the question of feasibility again arises. From the point of view of rationality as a logical idea, concern in economics shifted to the possibility that such a system could actually work. Indeed the obsession with the study of self-interested maximisation of utility continued from Smith to modern general equilibrium analysis. Arrow & Hahn (1971) defined this as the motivation for their work, in a most problematic methodological statement (p.vi-vii):

"There is by now a long and fairly imposing line of economists from Adam Smith to the present who have sought to show that a decentralised economy motivated by self-interest and guided by price signals would be compatible with a coherent disposition of economic resources that could be regarded, in a well defined sense, as superior to a large class of possible alternative dispositions. Moreover the price

1. For example, Ghieslin (1974) argues that Smith clearly saw that our moral sentiments have an evolutionary significance. See also on this Coase (1976, p.539) on the equation of natural selection and self-interest, and Hirschleifer (1978, p.238).

2 . See General Introduction, WN (1976, p.38).

3 . A recent attempt to formulate a dual utility maximisation problem of (i) maximise self-centred utility (WN) and (ii) maximise social utility in Margolis (1982) misinterprets Smith's intentions, though it remains an interesting exercise in its own right. See ch.4, p.190 below.

signals would operate in a way to establish this degree of coherence. It is important to understand how surprising this claim must be to anyone not exposed to this tradition... It is not sufficient to assert that, while it is possible to invent a world in which the claims made on behalf of the 'invisible hand' are true, these claims fail in the actual world. It must be shown first how these features of the world regarded as essential in any description of it also make it possible to substantiate these claims. In attempting to answer the question "could it be true?", we learn a good deal about why it might not be true."

In chapter three the relationship between assumptions and explanations was discussed, and I argued that these must be feasible. Thus the starting point I laid down for an explanation, and that for Arrow & Hahn's study are somewhat different. Indeed their methodology takes the assumption of self-interest as given, and then asks what agents would do in the pursuit of that self-interest. It assumes a theory of human nature, and thus an economic end, and then asks if the pursuit of it is consistent in its own production. It asks whether the pursuit of self-interest represented by a consistent set of preferences of one agent reduces the possible achievement of the ends of self-interest of another. What is at issue is whether rationality - instrumental rationality as a description of behaviour - should be especially reduced to that end, and whether that end is purely economic in nature or whether it is general. It would be hard to claim that this is what Smith had in mind in the WN; yet it is certainly true that parts of that book did encourage others to pursue that question.

3.4 DOMAIN

The idea of the economic domain as restricted to the pursuit of a specific and single end (wealth or utility) in a self-interested manner has been one of the clearer arguments for restricted domain (though some economists have added the claim that this particular theory of human behaviour applies universally). The natural selection argument, as employed by both biologists and economists, focuses on the survival and hence fitness value of that self-interest. It typically assumes it, and then works out the consequences for a world within which it is true [1]. Sociobiologists generalise self-interest, defined for them as fitness-maximisation of phenotype or geneotype, to all human and animal behavioural choices. They identify economics with the pursuit of self-interest, and all behaviour with the selection of fitness. Hence the maximisation of utility, selfishly regarded, is the universal motivation of human behaviour. However there is a second kind of restriction implicit in the literature; the restriction regarding the nature of economic problems. Just as it is perfectly consistent to generalise self-interest, it remains legitimate to generalise something else, to provide an alternative classification and explanation of behaviour, and indeed I shall argue for a pluralistic account. I next consider domain, and Becker's conception of economic behaviour.

1. See chapter four, section 4.7 on the confusion of roles of the self-interest assumption.

(i) Domain and economic competition

Competition operates within a framework of markets: economic competition is restricted to markets in which economic behaviour takes place. The question of domain is one of the extent of selection, and hence the extent of markets and the possibility of enforced maximisation. In discussing domain, there are two issues which any theory or model needs to confront. The first is fundamental in a very deep sense; it concerns the domain of reason and rational consideration. It involves both the question whether the reasons for action count in explanations, and if they do, whether the content of these reasons is restricted to certain types of reason. In chapter two above, I considered the extent to which evolutionary claims allowed for reason to enter into causal accounts of behaviour. The second issue, given the domain of reason, concerns the range of application or subject matter of certain types of reasoning and therefore certain types of behavioural models. It concerns the field of application, rather than the nature of motivation. If selection operates on humans to produce particular behavioural outcomes, attention then focuses on the limitations of that mechanism.

In this section, I consider the debate on the divisibility of social sciences, and in particular whether there exist any special characteristics in the economic domain which require the employment of special methods to study its phenomena. I consider first the claims for specialism, and then contrast these with more generalisable claims. The argument could be presented either as a philosophical exercise or as an examination of the arguments put forward in the economic thought which brought about the separation of the economic domain. The latter historical approach is

adopted here. In the literature reasons for separation and the special characteristics of behaviour are often jointly presented, and thus the separation used here will be necessarily imperfect.

The economic domain might be related to, or separable from, other subjects in two senses: it might be horizontally related to subjects on the same level, or it might be related vertically (by reduction) to more primary subjects. Examples of the former are politics and sociology, and of the latter the sciences. The relation with science affects the appropriateness of its methods. Some would go as far as to say the scientific method cannot be subject-specific [1]. There might also be a link with ethics. In this section I shall be primarily concerned with the horizontal relation, focusing on reduction in chapters four and five. Here I am concerned with what it is that is to be reductively explained on evolutionary lines, not with that explanation as such. The issue then is whether there can be an independent economic domain separate from sociological and political influence: whether economic behavioural necessarily includes, for example, political organisation and choice, loyalty, union political activity, and work discipline, which are also 'political' and 'social' questions. Can there be a special theory, and hence scope for a special selection process, for at least a part of economic activity, or is there an essential political and/or social relation in economic exchanges? Alternatively, are the political and social reducible to economic causes?

1. Hempel (1965, p.17) argues that "the way in which general hypotheses are used in science never involves the statement of a field of application". See also his (1969) paper on the relation of social to natural science.

Nassau Senior and J.S.Mill have both argued that economic behaviour is related to the particular end being pursued; while Robbins (1932) suggested that the existence of scarcity gave problems an economic characteristic. Each of these two approaches are shown here to be illegitimate. Having established a general case for universalisation, I shall subsequently examine the specific "imperialist" claims of Becker.

(ii) Defining the Economic Domain

The very separation of economics as an area of study suggests that its questions may be treated as if they occurred in isolation. In the early Political Economy tracts - whether in Smith, Ricardo or later in Mill - concern for the interaction of economic phenomena with the affairs of the state, and with the state as a necessary precondition for economic growth and development, was always to the fore. With the 'revolution' in economic thought in the 1870's, with the associated marginalist methods and the theory of value founded on exchange and demand rather than production and cost [1], this interactive approach was partially submerged. There were notable exceptions both in terms of individuals (Pareto for example) and in terms of areas of concern (in particular welfare economists concerned with the measurement of national products, such as Pigou). But it is not perhaps too great a generalisation to suggest that after the appearance of the marginalists in 1870, the separation of areas of social enquiry was much more marked. Associated with this division was the claim that the particular model of behaviour - utility maximisation - was especially appropriate to economic problems. The claim came in two forms: (1) that

1. See Hicks (1976b) and Kauder (1965).

the end of economic action may be separated out and examined in isolation; and (2) that the subject matter (rather than the end) is distinguishable, because of such features as, for example, scarcity and measurability. With regard especially to the first of these forms, the classical economists predated the marginalists. Because of the method of presentation and the type of reasoning employed, I shall first examine Nassau Senior's view, and then go on to consider in more detail Mill's contribution.

(iii) The ends of economic action: Senior and Mill

Senior is particularly clear as to the end to which the subject should be restricted. For him it is the pursuit of wealth in all its variables which was deemed to be the subject matter of political economy. The theoretical branch of Political Economy is "that which explains the nature of production and distribution of wealth" (1827, p.7). This branch rested on (p.7):

"a few general propositions, which are the result of observation, or consciousness, and which almost everyman, as soon as he hears them, admits as familiar to his thoughts, or at best as included in his previous knowledge"[1]

The main proposition which Senior claimed to be both intuitively obvious, and yet empirically founded, was (p.30):

"that every person is desirous to obtain, with as little sacrifice as possible, as much as possible of the articles of wealth".

1. This view of the propositions or postulates of economic theory was to be repeated famously by Robbins (1932) a century later.

This notion of wealth is defined (p.30):

"to include all goods and services which possess utility and are scarce, i.e., everything that enters into exchange."

Economics is then for Senior concerned with the material domain of human behaviour [1]. This wide definition of goods and services with consequential utility based on exchange, suggests that the focus of study should not be the classical concerns of production and distribution which so occupied Smith and Ricardo [2], but the more modern preference approach. Senior added a further restriction of the economic domain for reasons of tractability, and to provide a unit of account for comparison. He wrote (1836, p.27):

"Money seems to be the only subject for which the desire is universal, and it is because money is abstract wealth".

Money represents therefore the derived demand for wealth. Political Economy is thus solely concerned with the end of wealth, which can be proxied by money. This postulate approach, which Schumpeter so admired [3], produced a series of assumptions rather than justifications.

To Mill, such a set of postulates was not so obviously corrent, nor

1 . The definition of economics in terms of material objectives was carried on by Marshall (1920, p.1) and Cannan (1888, p.1).

2 . See on Smith and Ricardo, Hicks (1976b).

3 . Schumpeter (1954,p.484) claimed that Senior was "the first 'pure' theorist of that period" because he "attempted to unify and present economic theory according to the requiremants of the postulational method, that is, as a series of deductions from four induced or empirical postulates".

was the domain so clearly defined [1]. For my purposes, I shall concentrate on his 'Essay on the Definition of Political Economy' (1836), in which Mill divided the study of man into distinct categories (Collected Works, vol.4, p.319):

"We may inquire what belongs to man considered individually, and as if no human being existed besides himself; we may next consider him as coming into contact with other individuals; and finally, as living in a state of society, that is, forming part of a body or aggregation of human beings, systematically co-operating for common purposes."

Mill thought that this was one form of disaggregation which could be performed as a valid methodology in investigating human behaviour [2]. It is a much more carefully constructed argument than that of the postulates proposed by Senior, and is not empirically or intuitively based. The segregation of stages, to which pure mental philosophy, ethics, and social economy pertain respectively suggests that reductionism to psychology and methodological individualism is permissible. It is this third category, the social, which Mill then divides up in order to make a special case of a part of the whole. (The word 'whole' may be misleading here; Mill regards the whole as merely the sum of its constituent parts.) It is here that Mill introduces his concept of 'economic man' (ibid, p.321):

1. Mill regards the stationary state not with the distain of his predecessors (in particular Smith and Ricardo). He welcomed a state of affairs in which the destructive pursuit of wealth through competition would be at an end. He suggested population control as a way of preserving the standard of living. See ch.7, p.304 below.

2. See Mill's Logic (1843) Bk.3, ch.5, ss.3.

"[Political Economy] does not treat of the whole of man's nature as modified by the social state, nor of the whole conduct of man in society. It is concerned with him solely as a being who desires to possess wealth, and who is capable of judging of the comparative efficacy of means for obtaining that end. It predicts only such of the phenomena of the social state as take place in consequence of the pursuit of wealth. It makes entire abstraction of every other human passion or motive; except those which may be regarded as perceptually antagonizing principles to the desire of wealth, namely, aversion to labour, and desire for the present enjoyment of costly indulgences."

Mill goes on to make it clear that this is a theoretical construction, asking the question of what man would do if he were to pursue wealth to the exclusion of other motives or desires. He recognises that other desires do sometimes conflict with the pursuit of wealth, and regards these as 'checks'. He does not claim with Senior that wealth could in fact be pursued in isolation, or that it actually is.

Behind this methodology lies Mill's concept of science and the scientific method [1]. Science takes the ends of human action from Art, which determines them; it is an instrumental investigation of the best ways of attaining those ends. But a further point is worth noting; that the ends of human action, summarised by utility, may themselves be divided into parts. In particular, utility from wealth could be studied separately. Each partial explanation forms a part of behaviour. Man cannot act from any one motive alone, but his behaviour can be studied in this partial

1 . Mill (1836,p.321). See also the Logic(1843).

2 . ibid, p.322. Hicks' concept of weak causality discussed in chapter two of his (1979) similarly tries to separate out and examine each cause in isolation.

manner. Mill writes that [2]:

"Not that any political economist was ever so absurd as to suppose that mankind was really thus constituted, but because this is the mode in which science must necessarily proceed. When an effect depends upon a concurrence of causes, these causes must be studied one at a time, and their laws separately investigated, if we wish, through the causes, to obtain the power of either predicting or controlling the effect; since the law of the effect is compounded of the laws of all the causes which determine it."

So, for Mill, the end of human action, utility, could be divided according to its sources, and one presumes that Mill imagined that these components could then be added together to form an aggregate [1]. The idea of economics as an analytical investigation of a partial set of causes of behaviour, as having special objectives appropriate to it, is one of the clearest divisions associated with the idea of 'economic man'. Yet Mill was perhaps more careful than his followers in this regard; he did not claim that individuals were actually capable of such a single-minded pursuit of wealth, only that they could be studied indirectly as if they did.

Raised here are a number of methodological problems concerning partial causality and feasability which have already been discussed in chapter 2

1. Mill (1863), ch.2, discusses a related point of the conflict between the pursuit of higher and lower pleasures, and leaves the aggregate resolution unsatisfactorily defined. This particular point suggests a vector interpretation of utility which I discuss below in more detail in chapter four, section 4.5(iv).

above. The division of utility by source creates problems for selection and maximisation which will arise in chapter four. The purpose of this exposition is not so much to draw methodological conclusions as to indicate one argument for domain restriction, and hence a reduced scope for economic competition. This method of defining the domain predominates over another alternative in the literature which does not find such ready expression: that there is something special about the subject matter, rather than the ends being pursued. To this alternative argument for domain restriction I now turn.

(iv) Scarcity and economic subject matter

One particular type of claim concerning the economic domain is that it is restricted to 'business activity' and in particular with the allocation of resources. Marshall (1920, p.1) suggested that economics is "the study of mankind in the ordinary business of life". Cannan (1888) thought economics to be "the study of the things having to do with man's economic welfare", restricting the satisfactions to be included. But it was Robbins' definition, in his 'Essay on the Nature and Significance of Economic Science' (1932) which offered the most radical definition of its subject-matter. In contrast to the division of the economic domain according to the classical view into material and non-material, Robbins suggests that there are three fundamental characteristics of human existence of which the economist should take account. These are (p.12-13): (i) that the ends of action are plural and diverse; (ii) that the amount of time available and the means required to satisfy the diverse ends are limited; and (iii) there exist alternative applications of both the time and the means available. It is not that we should reduce ends to a single

economic one: "Nirvana is not necessarily single bliss. It is merely the complete 'satisfaction' of all requirements" (p.13). Robbins therefore regards economics as that domain concerned with the problems of scarcity, and such claims concerning scarcity and competition come closest to natural selection. He regards his conception as 'analytical' rather than 'classificatory' (as he calls the idea of concern with material welfare (p.16)). His approach (pp.16-17):

"does not attempt to pick out certain kinds of behaviour, but focuses attention on a particular aspect of behaviour, the form imposed by the influence of scarcity. It follows from this, therefore, that in so far as it offers this aspect, any kind of human behaviour falls within the scope of economic generalisations ... in so far as any kind of activity involves the relinquishment of other desired alternatives, it has an economic aspect. There are no limitations on the subject-matter of Economic Science save this."

Economic analysis is not limited to exchange and the ends of economic activity are not to be distinguishable from others (p.24): "to speak of any end as being itself 'economic' is entirely misleading. The habit, prevalent among certain groups of economists, of discussing 'economic satisfactions' is alien to the central intention of economic analysis".

Economics is then for Robbins, the method of analysis of a particular type of problem, where choice is involved instrumentally between different means to achieve given ends. It is an approach quite separate from the above arguments of Senior, Mill, Edgeworth and Smith, and is certainly not concerned with economic or egoistic hedonism. The Robbins view is that economics is about 'economising': the passive and mechanical selection of

those acts which achieve given ends [1].

This definition has not proved satisfactory to many of Robbins' successors. Robertson (1957) pointed out, in his first chapter 'What is economics?' (p.23):

"It seems to me that such a definition [Robbins'] is at once too narrow and too wide, excluding from the scope economics such topics as the defects of organisation which lead to a general underemployment of resources; and procuring the exclusion of the chemist and the engineer only to admit the army commander and the cricket captain placing his field, both of whom are concerned with allocation of scarce means which have alternative uses."

Even if the idea of scarcity were to be accepted, certain types of scarcity are more amenable to one type of analysis rather than others. The 'material' view of economics has continued to survive despite Robbins' attack, and most readily it has survived in welfare economics. But, as Hicks has pointed out [Hicks (1959 & 1976a)], welfare has had at least two distinctive meanings in this century - the Pigovian concern with the measure of national income, and the new welfare economists' concern with Paretian approaches. Pigou's famous claim^[2] that economics welfare is that

1. The passivity contrasts with the Austrian theories of von Mises and Shackle which focus on the active generation of choices and alternatives from which selection is made. The choice set is given for Robbins, not generated.

2. Pigou (1920). This was a view which Hicks (1974) was to describe as welfarist. Robbins (1938) gives his reasons for rejecting interpersonal comparison.

part of welfare that can be brought under the measuring rod of money carried through the problem of social accounting from the classics [1].

Robbins' solution has remained without universal consent and his use of the word "science" in his title gave further cause for controversy. If a domain is to be separated out, then it is important to understand the methodological status of the claims made within that domain. Economics, unlike other more backward areas of social inquiry, could be distinguished by its scientific method. The objections to this demarcation principle are those raised in chapter two above.

(v) Claims to wider applications of maximisation.

Thus far I have considered two quite separate types of claim for restricted domain - that the goal or end of economic action is special, and that the subject matter is special. I now go on to consider the wider claim, first generally and then in sections 3.5 and 3.6 quite specifically.

The larger claim of universalisation of the theory of human behaviour is to be found closely associated with utilitarianism, especially in Bentham's work, though of course the subject of political economy prior to the marginalist revolution of 1870 was always conceived as a wider subject of study [2].

More recently in this century, Wicksteed's 'Common Sense of Political

1 . See Hicks (1983) essay 2, on 'Social Accounting of Classical Models'.

2 . Modern Austrians such as Mises have also adopted universalisation positions. To him "all action is economic" since "economic action consists in the endeavour to remedy the state of dissatisfaction" (1960, p.61).

Economy' (1910), contains in particular in Bk 1, Chapter 5, a detailed analysis of homo economicus [1]. He stresses the conflict between introspective and behaviouristic approaches. He writes (p.165):

"We may either ignore motives altogether, or we may recognise all motives that are at work, but in no case may we pick and choose between the motives we will and the motives we will not recognise as affecting economic conditions."

Economic motives cannot be isolated out by behavioural methods, and thus either motives should be ignored altogether, or others taken into account. That does not of itself prevent isolation of the economic domain, but at least, whether behaviouralism is or is not rejected, it does prevent us from having just self-interest as the defining motive and characteristic of economics. Wicksteed himself argues for a separation of an "economic relation", rather than an economic motive, and that relation, following Jevons, was one of exchange. As such he is not a universalist, but rather presents a position similar to Robbins. The problem is that if the same motives apply, and if that relation is extended to include all scarcity cases, then it is not clear where the division is to be found. If however all behaviour is to be described as self-interested, then of course the economic approach is the approach to human behaviour.

It is interesting that the modern approach of universalisation which will be considered below is composed of a combination of both the pursuit of self-interest and the exchange condition; both of which have in isolation been used as arguments against universalisation. Those who claim

1 . The book itself is an exposition of Jevon's theory.

that such an isolation can be made must show why this is possible. It is illegitimate methodology to assume without argumentation a foundation and to construct theories upon it, relying on the predictions of the theory to excuse the assumed foundations [1]. Indeed, even if it is possible, there exists no empirical evidence to show that one kind of motivation is applicable more in one domain than another.

If the universalisation case has combined the two positions of an assumed end (self-interest) and an assumed economic relation (exchange), then it is pertinent to examine what happens when this model is applied to domains into which economists have not usually ventured. Self-interest may indeed be universal, but we cannot have a partial analysis of it as an explanation; the question "what would an agent choose if he were self-interested?" is a legitimate explanation of his behaviour only to the extent that he actually is.

1. The criticism of this methodology, portrayed by Friedman (1953) is widespread in the literature. See above p.40, and Wong (1973) and Helm (1984b).

3.4 ECONOMIC IMPERIALISM

(i) Becker's Economics

In numerous articles, and two books, Becker presents a masterly attempt at universalising his "economic" methods to all human behaviour. The books, 'The Economic Approach to Human Behaviour' (1976b) and 'A Treatise on the Family' (1981) respectively define the approach, and apply it to particular problems traditionally considered outside the economic domain. In the failure of this attempt, I shall argue that it is the model employed which is to be rejected, rather than the universalisation, unless some special reason can be given for the restriction of the self-interest motive to the economic domain. The argument for universalisation is not new as was seen above.

In the second and most recent of the two books, the theory is applied to the family. This application is considered here in some detail to see, by example, what would be involved in a widening of domain. The model's lack of appeal in explaining family and psychological feelings will indicate its undesirability generally, rather than the restriction of domain. Becker specifies his intention at the outset [1]:

"In this book I develop an economic approach to the family. The title does not refer to economic aspects of the family, however, because

1. Becker (1981,p.ix). Two substantial reviews of the book are to be found in Journal of Economic Literature, 1982, by Ben-Porath and Hannan. In Stigler and Becker (1977) again cases which are typically considered to be examples of non-economic behaviour, such as addiction and persuasive advertising are brought within the economic model. See on these, p 176f. below.

most non-economists and most economists would interpret the qualities "economic" to indicate that the discussion is confined to the material aspects of family life, to incomes and spending patterns. My interest is far more ambitious; to analyse marriage, births, divorce, division of labour in households, prestige, and other non-material behaviour with the tools and framework developed for material behaviour."

For Becker all human activities are treated as examples of utility maximisation from preferences that are relatively stable [1], and not just the conventional 'economic' behaviour. Self-interest is universal, not restricted in domain. The economic method, the core of which is for Becker (1976,p.5):

"the combined assumptions of maximising behaviour, market equilibrium and stable preferences, used relentlessly and unflinchingly."

is to be applied directly to traditionally non-economic questions such as family life.

On the basis of assuming that utility maximisation represents the whole vector of possible behavioural motivations, Becker proceeds to develop a complete theory of the 'marriage market', of mating (assortative), the demand for children, opportunities for children, inter-generational mobility, divorce, and change in family structure. Where other economists have been keen to stress the imperfections of economic systems in terms of the absence of markets, Becker sees markets

1. Becker (1976b). In the introduction Becker defends the stable preferences assumption necessary for maximisation of utility to be meaningful. See again discussion in ch.4.

functioning wherever he looks. Markets are where competition takes place; competition implies selection; and selection allows (for Becker) maximisation to be enforced. It is however necessary to establish what one means by a market; what the necessary and sufficient conditions for their existence are, and in particular what the informational requirements are, before assuming their existence. Assigning shadow prices where these are not visibly existent is open to both theoretical and empirical difficulties. These shadow prices value things only to the extent that the numbers assigned mean something to those involved. Providing an explanation of behaviour involves I argued in chapter two positing the reasons that the actors hold as partial causes. The legitimacy of valuing in say the 'marriage market' depends on whether the participants see it that way.

It is important to understand just how much Becker's universal theory claims. Every type of behaviour, human and perhaps non-human, can be reduced to a preference list as expressed in utility terms [1]. There is nothing special about emotions and feelings, such as love, hate, lust, tenderness and so on which cannot be expressed in terms of stable preferences in utility terms. (Actually introspective evidence would suggest that many of these emotions are highly unstable in nature; indeed the utility may be derived from their very instability). Furthermore, for Becker, every human interaction is governed by a price (if only a shadow one), where preferences are ascribed, and has a marginal interpretation.

Choices are governed by the consequences (expected or actual) of

1. This is, according to Becker (1976b) preface, the tautological or circular problem.

actions; these cases of emotional preferences cannot be considered non-consequentially for Becker. The notion that people in their less public relationships with others may act out of commitment [1], regardless of the utility consequences of their actions, or for other non-consequentialist reasons, is ruled out by assumption. Within this framework, and accounting for much of Becker's extension of the normal domain of economic consideration, is the idea that time is an economic good [2], in the sense that it also has a price and a market. Households allocate tasks between husbands, wives and children according to the opportunity cost of their time. Other considerations of inter-family behaviour, such as rights, are not applicable.

(ii) Bizarre examples of universalisation: marriage and love.

Becker applies his 'economic approach' to personal relations, and it is in his examples that the model is to be questioned. Because the examples seem to violate intuitive understandings, it does not follow that universalisation is invalidated. Rather it may be that it is the model itself which is at fault, and that the inapplicability of it to the examples suggests problems with it which also apply to other more traditionally economic domains.

Let us look at Becker's discussion of the 'marriage market' and at the notion of love. The 'marriage market' is treated like any other economic market. It is efficient if it is one which (p.66):

1. See p. 191-3 below and Sen (1977). See also Matthews (1981) for a discussion of the Marshallian distinction between public greed and private virtue; selfish behaviour in business and altruism at home.

2. Becker (1965).

"assigns imputed income or 'prices' to all participants that attract them to suitable polygamous or monogamous marriages. Imputed prices are also used to match men and women of different qualities: some participants ... choose to be matched with 'inferior' persons because they feel 'superior' persons are too expensive. Obstacles to the efficient pricing of participants arise when the gains from marriage cannot readily be divided or when one spouse (usually the husband) is given more power than the other. Bride prices, dowries, divorce settlements and other capital transfers evolved partly to overcome such obstacles."

The concept of 'love' can be for Becker accommodated within this market framework. In a domain where one might expect non-consequentialist behaviour, Becker specifically directs attention to preference and consequentialist utility. He writes that (p.82):

"the effect of love on the equilibrium sorting is analytically a special case of the effect of differences of preferences."

His argument here is based on altruism - love being expressed in terms of my utility depending on the utility of the person to whom my love is directed [1]. The agent still maximises his or her utility; the difference is that utility is here interdependent. Becker makes this explicit (p.84):

"It can be said that M loves F if her welfare enters his utility function, and perhaps also if M values emotional and physical contact with F. Clearly, M can benefit from a match with F, because he could

1. See by way of contrast Elster (1979,p.165) on the 'spontaneity problem'.

then have a more favourable effect on her welfare - and thereby on his own utility - and because the commodities measuring 'contact' with F can be produced more cheaply when they are matched than when M has to seek an 'illicit' relationship with F. Even if F were 'selfish' and did not return M's love, she would benefit from a match with someone who loves her, because he would transfer resources to her to increase his own utility. Moreover a marriage involving love is more efficient than other marriages, even when one of the mates is selfish, and increased efficiency benefits the selfish mate also."

By defining love in this particular restricted and indeed bizarre sense, the problems of the contradictions between selfishness and love are avoided. Love is defined as a part of expanded self-interest; there being no other permitted motive by assumption. The theory is a classification of behaviour, not an explanation in itself [1]. Becker reinforces the final point about efficiency by invoking what he calls the 'Rotten Kid Theorem' (ibid,p.179 & 1976a), which states that the selfish mate is induced to act as-if he or she cares for the benefactor in order to increase the level of derived utility.

(iii) Becker and Sociobiology

Becker's position illustrates what happens when the model of maximisation of utility is expanded to cover domains, such marriage and love discussed above, where economists have previously not wished to venture. If there exist no special reasons for domain restriction, then what he has attempted is simply to work out the logic of the model. This

1. See chapter two, section 2.3(iv) on classifications.

model is closely related to sociobiological models. The parallel does however bring out a further point: that the economic claim to hegemony is not without rivals - there exist political models [1], as well as biological models which would also claim to dominate the explanation of human behaviour. The universalisability position does not require a single model; there may be a plurality. What the example does illustrate however is that no one model is a priori applicable to a specific domain, unless some clear demarcation criteria are proposed and defended.

The sociobiological approach to human behaviour is employed by Becker to justify his model, though ambiguously, he stops short of the full reductionist account. For him it is a combination of the economic approach and the sociobiological approach rather than making one a derivative of the other. He states his methodological approach in his 1976 article as follows (1976a, p.826)[2]:

"I have argued that both economics and sociobiology would gain from combining the analytical techniques of economists with the techniques in population genetics, entomology, and other biological foundations of sociobiology. The preferences taken as given by economists and vaguely attributed to 'human nature' or something similar - the emphasis on self-interest, altruism towards kin, social distinction, and other enduring aspects of preferences may be largely explained by the selection over time of traits having greater genetic fitness and survival value. However, survival value is in turn partly a result of

-
1. One interpretation of Marx follows this universalisation claim.
 2. The full reductionist account was first entertained by the Social Darwinians. See on this Hayek (1982), p.23 & p 71 above.

utility maximisation in different social and physical environments".

And in his Treatise, he stresses that actions can be explained in the maximising model without reference to conscious mental states, the reasons for actions (p. x):

"Of course, I do not assume that other species calculate the relative advantages of different behaviour or 'try' to maximise; the economic approach does not even assume that humans consciously maximise. Moreover, the application to the biological world of an approach developed for humans does not presume that human behaviour is significantly determined by biological considerations - only that non-humans as well as humans allocate scarce resources while competing in various situations."

Becker's argument leads him into circularity, as he has come close to admitting elsewhere [1]. The strong version of the sociobiological reduction typically assumes that the environment is made up of utility maximising agents. It then shows why this assumed behaviour is guaranteed: that self-interested maximisers will turn out to be genetically the fittest. Hence they will be selected. The circularity is thus apparent; it depends on first assuming agents are maximisers, and using that premise to generate the assumption. Even this however may not be sufficient; maximisers may in aggregate produce non-maximal outcomes [2]. Furthermore it is not obvious that the best strategy is a maximising one if at least some others are non-maximisers. These are all cases which I shall say more

1 . (1976b), preface.

2.. See Schelling (1978a) and p .150 below.

about in chapters four and five.

What should be stressed at this stage is that Becker employs selection and sociobiological arguments to justify a series of assumptions of the 'economic approach', and I shall show that these different arguments may be inconsistent. On the theory of preference formation he suggests a series of partially conflicting theories. First preferences are themselves subject to selection. Second, self-interest is selected for. Third, there are good reasons for supposing that cases which are typically held to demonstrate instability are in fact readily explained within the constancy framework. Fourth, he argues that a version of self-interest includes altruism, where altruism can be defended on an evolutionary selection argument. Fifth, the rationality assumption is not necessary to establish the important theorems of modern economics. The inconsistencies arise out of appeals to a dynamic process to justify constancy of preferences over time; of applying selection to some components of behaviour, but not to human nature itself; and as to whether consistency of preferences matters at all. I shall in the next chapter consider these claims, and show how the inconsistencies arise.

3.6 SOCIOBIOLOGICAL IMPERIALISM

Modern theories of sociobiological explanation date from the work of Hamilton (1964), Trivers (1971) and most famously Wilson's (1975) treatise, 'Sociobiology' [1]. The theory has produced an intense debate reminiscent of the early reception of Darwin's theory. Just as in the latter case, much of the criticism has been misconceived, a misconception compounded by its most ardent advocates.

What kind of theory is sociobiology, and in particular how does it measure up to our criteria of explanation set out in chapter two above ? What are its causal mechanisms? What classifications does it propose, and how does it treat mental states and reasons for action ? Is it empirically testable?

The sociobiological theory is one explanation to cover a given data set; one amongst many. It relies on a classificatory scheme for description, and employs theoretical terms to translate that classification into a causal account. It takes concepts like altruism and competition, and forces them into particular categories by redefining them [2]. Given any data set, there are, as was pointed out in the discussion of the Quine-Duhem thesis in chapter two, a large if not infinite number of possible categorizations. Because one classification is all encompassing, it does not necessarily follow that it is the correct one.

1 . I should perhaps stress that what I here call the sociobiological position relates to the theory expounded by Hamilton et al., and not the weaker more plausible cases also proposed in the literature.

2 . Burini (1981,p.378) describes this procedure as a case of 'back-metaphor'.

Sociobiologists are confronted with enormous variety in the world. That variance needs to be explained: how could selection lead to different and equally successful outcomes? To argue that behaviour is partially determined by biological factors is a relatively harmless claim dependent on the degree of determination: to claim that all human behaviour can be so reduced is a much stronger claim open to specific objections [1].

The sociobiological research programme is a reductionist one which relegates the role of motives and reason in action - sometimes it is physicalist (reducing motives to neurological changes) and sometimes it is behaviouralist. In Wilson's exposition, it is both. Specifically, it is the application of the evolutionary theory outlined in chapter two to the explanation of human behaviour, and in particular social rather than individual behaviour. The problem, recognised by Darwin himself, is that if selection occurred at the individual level, there existed many examples of behaviour which did not directly favour the survival of the individual, and hence apparently contradicted the theory. Most apparent was altruism, and sterility, and the most complex problem to which much research was directed was the problem of insect 'societies' where sterile castes of workers acted against their own interests in order to benefit the society as a whole. The key insight, provided by Hamilton (1964) was to suggest that the notion of 'own or self-interest' be widened. Just as from Adam Smith onwards we saw earlier in this chapter a discussion of a wider conception of self-interest, so the sociobiologists also grappled with the meaning of this concept. If the domain of selection was widened to include

1 . It is interesting that even the clearest biological reductionists feel difficulty in dealing with cultural behaviour. See for example Dawkins (1976),

not just individuals, but genetically similar individuals, then members of the population might enhance the survival of at least some of their own genetic material by helping others and reducing their own 'fitness', when those others contained some of their own genes. The fundamental problem of sociobiology is therefore the explanation of apparant altruism.

Trivers (1971) expanded the coverage of the theory to explain apparently altruistic acts where no genetic material was assumed to be common between the participants. He proposed the idea of 'reciprocated altruism', whereby one individual acts to help another if, and only if, he expects that individual to reciprocate at some future date. In other words, the individual might enhance his long term interests [1] by making some short term sacrifice now for an expected reciprocated sacrifice in the future, if there are economies of scale to be exploited by joint-production. The problems with this development are twofold. The first is that the theory of specific, directed two-person altrusitic acts is not equivalent to generalised altruism, directed towards society rather than specific individuals [2]. Secondly, since returns are expected in the future, they are uncertain. A prisoners' dilemma problem arises [3] in which the possibility of free-riding emerges. In treating altruism and self-interests in the next chapter these difficulties will be appraised.

1 . Trivers (1971,p.39).

2 . For example blood giving and anonamous donations. On this see Collard (1978) p.140. One possible explanation of generalised altruism is that in small populations, the cost of doing a small favour is low and there is a good chance the beneficiary will be related anyway. This is called 'statistical kinship' in the literature.

3. See Collard (1978),pp.45-49 for prisoners' dilemma and Trivers' predictions.

The theories of Hamilton and Trivers was generalised by Wilson in his 'Sociobiology: a new synthesis'. Wilson however was less cautious than Hamilton or Trivers and the consequence has been an intense debate [1]. Claims made in debate suggest a much more whole-hearted reductionism than had hitherto been the case. These included:

(1) sociobiological models must be used in explanation of universal types of behavioural tendency, trend or pattern for all animal behaviour.

(2) in so far as humans are one species of animal, evolutionary theory can explain regularities of human behaviour.

(3) organisations, representing rules and methods of human decision-making, evolve and thus have evolutionary explanations.

(4) disciplines concerned with human behaviour (eg economics, politics, anthropology, sociology) are branches of biology.

(5) normative values and philosophies are biologically determined.

These claims, in increasing order of determination, were presented in a forceful and controversial way. As Caplan points out (p.9):

"The claims for sociobiology have been made with a stridency and conviction that have led some to consider whether ideological, *are being imported into sociobiological discussions* valuational, and metaphysical presumptions/of human beings in the name of empirically valid scientific findings and methods".

Moral considerations are not of direct concern at this stage, though I

1 . See for a sample Caplan (ed)(1981). The subsequent list of claims is derived partially from Caplan's introduction, p.8.

shall return to this area in chapter four and in the concluding chapter. What is my concern is the extent to which arguments based on selection can justify self-interest as an assumption, and altruistic behaviour under that description. The common feature of these claims listed above concerns the possibility of genetic explanation of social behaviour, and a key characteristic of that cooperation in some form of altruism. To the extent that sociobiologists consider altruism to be "the central theoretical problem of sociobiology", and since survival might intuitively be thought to put a premium on self-interest, the possibility of an evolutionary defense of altruism would give critical support to Becker's 'economic approach'. (The centrality of altruism suggests quite a narrow conception of what 'social' behaviour consists of).

3.7 COMPETITION: SHORT AND LONG RUN ARGUMENTS.

The theory of evolution is about the long-run, so long as it is based on a Darwinian conception of natural selection. If however it is Lamarckian, and thus allows for acquiring characteristics, there is no reason (save the cost of investment in acquiring the characteristics on which the economics of education has much to say) why it should not be rapid.

Using the Darwinian theory, the analogous consideration in economics is then with the long run. Now it is a curious fact that generally long-run theories have been the concern of Classical and Austrian economists, but not the more neo-classical general equilibrium ones. Smith, Ricardo and Marx and Mill proposed such theories, as did Schumpeter, Kirzner and Mises; but not Walras, Jevons and Menger (except in a very restricted sense) [1]. The marginalists typically assume that in the long run all factors are variable, and in that sense they have a long run flex-price model. But it is not an historical claim; it is not in time despite Marshall's [2] explicit attempt to put it in a temporal context:

"And this element of Time requires more careful attention just now than does that of Space. For the nature of the equilibrium itself, and that of the causes by which it is determined, depend on the length of the period over which the market is taken to extend. We shall find

1 . Indeed the classics and moderns gave differing definitions of what economics was about which influenced this division. For Smith it was the causes of wealth, intimately associated with growth, distribution and change; for Walras the determinants of price.

2 . Principles (1920), pp.274-5.

that if the period is short, the supply is limited to the stores that happen to be at hand: if the period is longer, the supply will be influenced, more or less, by the cost of producing the commodity in question; and if the period is very long, the cost will in its turn be influenced, more or less, by the cost of producing the labour and the material things required for producing the commodity."

It may be objected that I have here neglected neo-classical growth models, with their stress on technical progress residuals. Yet these theories do not explain growth from a causal direction in the way that either the evolutionary theories or the classical ones do.

Equilibria in the short and long-run are quite different, yet the biologists' ESS, introduced in chapter two, is long run Nash-equivalent equilibrium [1]. The claim in this latter state is that it will actually come about, while the marginalist economist does not normally claim that at some future date his long run state of affairs will actually occur. Rather the long-run equilibrium prices are what would occur as the natural or normal values of commodities, if conditions were stationary for long enough. What should be stressed is that the evolutionary theory allows (indeed is a theory of) for disequilibrium and imperfection; mutations are analogous to shocks and surprises to the system [2], throwing it out of its equilibrium path. So it would be natural for the theory of enforced maximisation in the long run to have a source for disequilibrium shocks in

1. But note that it is Nash only in the sense of its individual regarding behaviour, not in maximisation terms.

2. Indeed the role of shocks or surprises has led some historians of economic thought to suggest an Austrian line of descent for the Lucas-Sargent-Wallace new classical macroeconomics.

its system.

(i) Classical and neo-classical theories of economic competition

The classics typically, however, did believe that the stationary state, the socialist state or whatever, would actually happen. They proposed a causal explanation of how these would come about; whereas in the long run models in modern theories one does not find a causal account of how such flexibility is to be arrived at. Indeed, reasons are given why it will not, either because falling transactions costs imply that firms and planning will replace markets [1]; because concentration has increased; and because other explanations of the growth of fix-price markets, associated in particular with Hicks [2]. Markets are where competition takes place; their extent determines the extent of selection. The questions which arise are: what is the extent of the market, how efficient is it; and how long do the forces of competition take to work themselves out? Let us consider first efficiency and time periods.

The history of economic thought abounds with different accounts of the process of economic competition. These differ in at least two respects: the choice of the key explanatory variable, and the notion of what dynamics mean. The major distinction between the classics and the moderns concerned the latter: in general classical writers were concerned with a society which they regarded as one in transition. That transition was towards a

1 . Williamson (1981) discusses the various forms that transactions costs take. Hannah (1983) is perhaps the best account of the development of large-scale enterprises; with regard especially to political demands for rationalisation, the capital market and managerial change.

2 Hicks (1969) esp.chs.9 & 10.

point; for many (Ricardo in particular) this was (see above) a stationary state with quite undesirable properties. Of these writers, Smith thought that the economy would evolve towards growth and increased prosperity by the division of labour; and increased division of labour led to an increase in output. Output increases led to rises in demand pari passu, which expanded the extent of the market. Hence although the division of labour is limited by the extent of the market, it expands that extent. Wages could be indefinitely kept from subsistence by the expansion of output, ahead of population growth.

Such optimism foundered on the unfortunate reef of Malthus and his population theory, and on Ricardo's stationary state. Both Ricardo and Malthus, despite well-known difference, believed in some form of the iron-law of wages, and its 'dismal' prospect. For the crucial factor in the Smith account was continued increased returns to scale. However Malthus pointed out that in agriculture this could not be expected to continue: while population expanded at a geometric rate, food production would manage to grow only at an arithmetic one. The result forced wages to subsistence level, as labour supply expanded elastically to meet the demand. Since changes in infant mortality were closely related to food provision, population could reasonably be supposed to expand quite rapidly on an improvement in conditions. A reduction in the birth rate, via birth control, was unexpected. It was this struggle of population which gave Darwin his insight [1].

Marx attempted to define the laws of motion of a capitalist economy,

¹ . See p.70 above.

based on an economic determinism driven by the method of production. Competition led to an increase in concentration and a falling rate of profit; wages were forced down to a subsistence level, and the social structure deriving from the economic facts of life coalesced into mutually antagonistic forces, inevitably bringing about eventual revolution and the fruits of the communistic state.

J.S.Mill told another story. The stationary state would arrive on Ricardian reasoning, but population need not follow Malthus' unpleasant geometric progression. Voluntary choice could lead to birth control; the wage would then be kept above subsistence, and people could opt out of the unpleasant reality of struggling to gain an advantage of their fellow men [1]. Birth control was a matter of educating people, and hence Mill spent a considerable part of his political life campaigning for it [2] .

These accounts differed radically from what was to follow. Marginal theory was essentially static; no realistic dynamic theory based on neo-classical principles has ever been erected as a convincing explanation of the growth of modern capitalism, and in particular of the corporate economy. Indeed such concepts are precisely what the theory tries to eliminate [3].

In the modern period there are a few exceptions; these include Schumpeter's (1934) theory of economic competition, Hicks' A Theory of

1 . See quotation from Mill on p.304 below.

2 . See Hicks (1983), p.68 on Mill and the stationary state, and especially the amusing footnote 14 on that page.

3 . The standard references to the neo-classical growth theory are still Hahn & Matthews (1965) and Solow (1970).

Economic History (1969), Friedman's theory of capitalism (1980), the Austrian approach in its subjectivist form of Schumpeter, Hayek and Shackle, and the modern theory of the growth of the firm, associated Marris (1964) and Chandler (1977). These are antecedents of the theory of competition, and all except Friedman deviate from strict enforced maximisation.

(ii) maximalists and minimalists

In considering these views of the theory of changing markets, an important distinction will help to organise them for my purposes. This is between maximalist and minimalist views of the market. A maximalist believes in market efficiency; a minimalist does not. To the maximalist, markets in general result in optimal (best) outcomes. There may be exceptions, in the form of government intervention, taxes, tariffs, and in some public goods. These are however exceptions, where constraints have only to be rearranged to return to the optimal. His terms are equilibrium and maximisation. This position is one which can be readily associated with Becker's views outlined above. Since these have already been considered, I shall conclude this chapter with discussion of the minimalist's position, concentrating on one version of it defended on evolutionary grounds - that of Schumpeter.

The minimalist admits of frequent market failure, and his terms are disequilibrium, imperfect information and uncertainty. Thus the possibility of selection and evolving of growth emerges from this uncertainty. The role of the entrepreneur in exploiting disequilibrium is stressed, whereas maximalist neo-classical growth models typically have

little room for this 'factor of production' [1]. No theorist precisely fits these categories, for they are 'visions' of the economic system, ideal types, frameworks of reference, rather than exact models.

(iii) Schumpeter's theory of economic history.

Schumpeter explicitly refers to his theory as an evolutionary one. It is evolution by analogy rather than reduction. The key component of the theory is innovation. It is the exogenous element, though Schumpeter cannot resist giving some account of their causes. He does not point to the 'Protestant Ethic' explicitly, as Tawney (1938) had done, but he does consider that the social framework of capitalism, with its stress on individualism [2], is more likely to produce innovation. Capitalism, for Schumpeter (1939,p.223) is:

"that form of private property economy in which innovations are carried out by means of borrowed money, which in general, though not by logical necessity, implied credit creation".

Innovations tend to be clustered and are defined quite generally to include (i) the introduction of new goods; (ii) new methods of production; (iii) opening of new markets; (iv) conquests of new sources of supply; and (v) new organisational forms. They are disequilibrium phenomena, and thus a more successful society is one that aids creation and disruptive entrepreneurial activity. The entrepreneur is motivated by (i) the desire and will to found a private kingdom; (ii) the will to conquer; and (iii)

1. See in particular on the entrepreneur Kirzner (1973), Knight (1921), Schumpeter (1934), and more recently, Casson (1982).

2 . See Schumpeter (1942).

the joy of creating. He is not a maximiser, and capitalism is the form of activity which both allows this degree of anarchy and provides the money finance. Innovations are hence non-rational in origin and unpredictable ex ante. Progress is violent, discontinuous and abrupt (1939,p.44).

However, innovation creates the very forces which lead to its own decline. Capitalism, Schumpeter (1942) claims, inevitably turns into socialism as pressure for oligopolistic collusion grows, leading to the intermediate stage of 'Trustified Capitalism', where planning and control militate against innovation.

Schumpeter claims this to be an evolutionary theory, and his work has been the mainspring for modern 'evolutionary' theories in economics, in particular Nelson and Winter (1982) and Boulding (1981). The relation is at best an analogy however, and it is unsupportable except in the weakest sense. In chapter two, I argued that mutations are characteristically small, random and exogenous in evolutionary theory. Schumpeter's innovations are however typically not random. They occur in clusters [1], bunched together by joint-causal factors. They are endogenous in the sense that a theory of innovations is proposed, howbeit somewhat vaguely. Innovations may not be small; they may be large enough to alter the environment which acts to select them, either by altering it physically, or by altering people's perceptions of it. Defending the Schumpeterian analogy, one could argue that it is the new idea which corresponds to the mutation; the impact of the idea of an innovation itself is causal, and may be large [2].

1. Schumpeter(1947).

2. Further support may come from the idea of "punctuated equilibria", of relatively rapid local change, followed by a period of stagnation,

cont/

(iv) Other minimalist views

Both Shackle (1949 & 1967) and Hayek (1937) stress the imperfections of the market system and the sources of instability. But one interesting feature which emerges is that stressing market imperfections does not of itself imply a policy bias against markets: indeed in Hayek's case it is quite the reverse. The price system economises on information that the participants has to process; hence it is superior to the much more informationally demanding planning method of allocation.

Shackle's theory represents a radical subjectivism which denied the possibility of general probabilistic calculation. For our purposes, these criticisms tell against maximising behaviour with respect to beliefs which will be analysed in chapter five. The inability to form probabilities makes maximisation under uncertainty meaningless and undermines the enforced maximisation which Muth argues as a justification for rational expectations.

One other strand of economic theory which is minimalistic in conception, but not in the Austrian mould, is that of the behaviouralists. Behaviouralist theories associated with Simon (1955) and Cyert & March (1963) stress the boundedness of human rationality, and the mental limitations on calculating alternative consequences of possible acts. If behaviour deviates sufficiently from the optimal then it will be revised, but not all imperfect practices are eliminated. In chapter five I consider the effect of the behavioural limitations stemming from the use of corresponding to Schumpeter's theory of clusters. See for the biological theory, Eldredge & Gould (1972). The alternative view supporting gradualism is also defended in the same volume by way of comparison.

Cont/

aspiration levels in analysing a limited number of alternative activities. Furthermore I analyse evidence in chapter four of psychological studies questioning the degree of choice consistency that is required for maximisation. In chapter six, the implications of this satisficing approach are examined for firm behaviour and the theory of enforced profit maximisation. To enforce a maximising outcome by selection, there must be initially some maximisers. To be a maximiser, maximisation must be feasible according to our criteria in chapter two. Simon's argument is that such a capacity is not to be expected.

3.7 CONCLUSIONS

In this selective survey of antecedents, I have considered the role of self-interest, the domain of economic competition and hence the potential reductive or analogous explanation, and some theories of long-run behaviour. Forcing a categorization of the literature is far from satisfactory, but it does serve to illustrate two points. First, the ease with which some writers claim these so-called evolutionary theories naturally relate to the concepts of economic thought does not stand up to careful investigation. Secondly, that the treatments of these issues - self-interest, domain and long-run processes - are frequently ambiguous, with a wide variety of alternative explanations. Strictly, the evolutionary theory can permit of only one. Altruism must reduce to self-interest; domain must be universal; and the long-run must be explained by survival and fitness. A singular causality theory fits uneasily on the pluralistic disputes in economics. In the next three chapters I show just how uneasy that fit is for preferences, beliefs and firms respectively.

PART TWO:

COMPETITION AND ECONOMIC SELECTION

CHAPTER FOUR: ENFORCED PREFERENCES: Explaining Preferences and Altruism

4.1 INTRODUCTION

Preferences are basic to human behaviour. Any economic theory ultimately rests on assumptions about preferences, and enforced maximisation is no exception. Strictly the theory of enforced preferences relies on the reductionist component of evolutionary argument in economics and accepts the fundamental assumption of sociobiology that human behaviour is ultimately traceable to genetically determined causes. It has two forms: (i) that behaviour is partially determined by genetic factors; and (ii) that it is totally made up in this fashion. The first claim is not controversial, whereas the second is. It is a statement of a particularly strong version of causality. Although reason might be inclusively determined by genetic factors, its independence is somewhat compromised. Some deterministic element is present in all sociobiological explanations. In this chapter I am concerned with the limitations of reductionist explanations, and in particular with showing that the maximisation assumption cannot be justified along this line of argument, and in two senses.

The first concerns preferences, their change and stability. In order for maximisation to be enforced, it has to be possible (feasible), and that means that preferences must be of a certain form. That form is an ordering, and the assumptions or axioms typically invoked to guarantee this include most importantly transitivity and completeness. Economic behaviour typically occurs over time, rather than statically, and hence the

traditional theory also assumes constant and/or stable preferences to guarantee transitivity over time. I shall argue that this traditional representation does not provide a good explanation of consumer behaviour, and that typically preferences are endogenous and perhaps unstable. It will thus follow that these necessary conditions to enforce maximisation are not met, and thus the the theory fails to adequately explain behaviour.

The second concerns the central problem of sociobiology, the explanation it provides of altruistic behaviour. I shall argue here that there are wider reasons for action other than utility information, and that these include moral reasons which can be non-consequentialist and non-self-referring. Such reasons could not be possible under a utility characterisation of reasons or motives for action, which is itself another necessary condition for enforced maximisation to be possible (feasible).

In economics the most forceful advocate of reductionism (as well as of economic imperialism) is Gary Becker. He has, as was seen in chapter three, specifically addressed himself to this question: with respect to the independence of demand curves from considerations of rationality and the reasons for action (1962); the constancy of tastes and their similarity between individuals (Stigler and Becker 1977); the content of tastes, particularly altruistic preferences (1976a, 1981); and finally with respect to motivation and rationality (1976b, 1981). In chapter three Becker's views on the domain of maximising behaviour in explaining all human behaviour were exposited. Much of this chapter will be taken up with the economics of Gary Becker, since he holds many of the views that are here resisted.

In this chapter then, the reductionist programme is critically appraised. Becker's approach, outlined in the previous chapter, is analysed and shown to be unsatisfactory. It is used as an example of reductionist accounts, and criticisms of it apply, I shall argue, quite generally. First however, the conventional approach to the theory of choice needs to be stated, and its axioms. Secondly, I shall show what is at fault in this theory; specifically why a theory of preference formation is of importance to the study of human behaviour. Thus our first task is to support Becker's contention that the problem (of preference formation) which he and others, in particular sociobiologists, investigate is a real one. This entails an investigation of conventional theory and evidence with respect to preferences. The latter turns out to be highly contentious. Next Becker's solution is discussed, and a critique put forward, concluding that maximisation is not necessarily enforced or enforceable in the preference method.

Once the central question of preference content has been removed, the further reductionist claim concerning self-interest must be met. In chapter three, its central presence in economics was noted, though its domain disputed. The sociobiologist is much preoccupied with this, and in particular with giving an account of how apparently altruistic behaviour can be so prevalent, if it seems to reduce genetic fitness. Wilson (1975), we noted, goes as far as to claim that this is the central problem of sociobiological research [1]. The answer these writers give is to reduce examples of apparent altruism to cases of sophisticated self-interest. In

1. Others, notably Nagel (1970), see it more generally as the central problem of moral philosophy.

resisting this claim, the utility representation of preferences, and the extent to which people act only with respect to the consequences of their acts, are questioned, and the possibility of non-utility information motivating actions considered, including a plurality of moral reasons. My argument involves the claim that there are at least some essentially reasoned choices which are not genetically determinate in the way that sociobiology (and hence enforced maximisation in the reductionist sense) suggests, and that are not therefore self-interested.

The sociobiologist view is one paradigm or classification within which apparent deviations are reinterpreted. My more pluralistic account is another classification, howbeit somewhat less precise. To decide between them, this chapter applies the methodological criteria of feasibility, causality and classification developed in chapter two in explaining behaviour. Reductionist accounts rule out mental phenomena in explaining actions, focusing instead on genetic determinants. This chapter constructs rival teleological explanations of the 'hard cases' (such as altruism and consistency) which are not easily accommodated in the theory of enforced maximisation.

PART ONE: CONSISTENCY AND STABILITY OF PREFERENCES

4.2. THE THEORY OF CONSUMER BEHAVIOUR: A CRITIQUE.

Modern consumer theory is dominated by two logically similar, but methodologically distinct, theories: ordinal utility and revealed preference [1]. In this section I shall concentrate on the former, since its emphasis on consistent choice is most precise. Nevertheless since revealed preference infers mental states from observed actions [2], it will be criticised as a theory which has in common with evolutionary theory the attempt to provide primarily reason-independent explanations.

The ordinal approach emphasises the framework of choice rather than the content of preferences [3]. Indeed the method by which preferences are generated is assumed to be independent of the ability to satisfy them. Maximising utility is independent of the origins of utility. One of the questions which the theory is designed to answer is what would have to be true of choices in order to derive an ordering, which when coupled with an appropriate motivational assumption (maximising in a self-regarding manner) produces outcomes which conform with our intuitions. These intuitions, concerning value and demand, may be empirically supported.

1. Ordinal theory here essentially means that of Hicks & Allen (1934); revealed preference that of Samuelson (1938).

2. Samuelson (1938) takes this positivistic line, which is developed in his (1963) defense of 'operationalism' and which led to the famous F-Twist/S-twist argument. On the methodology, see Wong (1973) and (1978). The behaviouralism of revealed preference also characterizes the Ramsay-Savage approach to revealing belief-states, and this is discussed and criticised in chapter five below, pp.242f.

3. On the relation between choice and value see Broome (1978) and Little (1949).

(i) Axioms of Preference

The axioms invoked in the ordinal theory are, unlike hypotheses, universal in domain of application. They are in themselves propositions of a logical system, rather than hypotheses about the real world, and thus the theory is not directly an explanation or an empirical theory. By directly, I mean that for explanation a further auxiliary claim is required: correspondence propositions, that individuals behave as the axioms require, and that the goods observed in the world are what the theoretical preferences refer to. For empirical results, it should be noted that another auxiliary hypothesis is needed. Nothing is unconditionally predicted by ordinal theory. In particular the demand function is only negatively sloped if the income effect of a price rise is not positive and greater than the negative substitution effect. Furthermore these can be predicted from non-maximising models [1]. But clearly it is the operational variant of the theory which is of interest: thus the correspondence of behaviour to the axioms and the conventional assumption about the normality of goods are usually appealed to. In questioning the credibility of this theory, the extent of the correspondence between the theoretical terms and observed behaviour needs to be investigated. There is no accepted way of proceeding with such an investigation, since it is, as I pointed out in chapter two, a matter of dispute as to whether the assumptions or the predictions should be checked.

1. Becker (1962) makes this point: "Not only utility maximisation but also other decision rules incorporating a wide variety of irrational behaviour, lead to negatively inclined demand curves because of the effect of a change in prices on opportunities".

There are then at least two reasons why attention should be directed at the axioms or assumptions. The first is that there are few if any precise predictions which discriminate between alternative explanations. The second is that the meaning of a predictive test, and in particular failure to pass it, is at best ambiguous. In chapter two, the arguments concerning the Quine-Duhem thesis and the use of ceteris paribus clauses were discussed, and the case for stressing the reasons for actions as causes, and feasibility as a criterion of appraisal, was advanced. It follows directly from that discussion that the appraisal of the reductionist account of preferences involves disputes about axioms.

In this section therefore I will tackle the evidence relating to feasibility and causality of the major axioms of the ordinal utility theory, and suggest reasons why they may be thought to be unsatisfactory. That is necessary in order to justify the search for a theory of preference formation, which is in turn the motive for Becker's invoking the sociobiological approach. For if preferences obeyed the axioms, then the need to explain in a reductionist manner their origin would not be so strong. If economists cannot rely on the existence of an ordering, then some theory of preference formation is required, some statement about the content of preferences. So in this section I justify this, which Becker holds in common with his adversaries. It remains to give reasons for deciding between the disputants.

The essence of our approach is to argue that there are many different sorts of preferences, just as there are many sorts of beliefs. Economists

have tended to treat all preferences alike, and as exogenous [1]. Yet different sorts are acquired in different ways, and their stability and susceptibility to alteration varies. There are also different levels of preference; some are basic or primary [2]; others may be derived, less important secondary ones. My argument will be that preference formation is complex, and that no single theory will suffice. This implies rejection of particular theories of constancy based on reduction, such as the Becker approach, and I will argue that there can be no unique theory to replace it.

Turning directly to the axioms themselves, the most important of these are the consistency requirement (sometimes regarded as a narrow meaning of what it is to be rational) and second, the completeness axiom, which makes claims about the scope of human reasoning, and thus implicitly about our feasibility criterion.

(ii) Consistency as Transitivity

The idea of transitivity as a necessary condition for a consistent preference ordering has some limited intuitive appeal but, as will be seen, little empirical support. It is central to the theory of choice, frequently being taken as a necessary condition for rationality [3], though its role is somewhat different in revealed preference and in ordinal approaches. It is defined in a timeless way, and may only be strictly applied to choices - actual or counterfactual - at a point in time.

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1. Hirschman (1982a,p.9) notes this prevalence, and some of the motives for it.
 2. This issue of level is discussed below in the section 4.4 on endogenous preferences.
 3. Sen (1982b) p.5.

Transitivity over time requires the joint claims of transitivity at a point in time and constancy of preferences over time. The latter assumption is specifically of concern to us, since it is what Becker has defended and is the most important operational assumption. The problem then of checking the axiom of transitivity is that in the absence of the rare (or strictly, impossible) event of simultaneous choice, transitivity can only be tested over time and the joint hypotheses of constant tastes and transitivity are empirically indistinguishable [1]. Deaton and Muellbauer (1980,p.27) note that:

"This axiom is at the centre of the theory of choice and has the greatest empirical content of those axioms responsible for the existence of preferences. Nevertheless, it is quite difficult to think of satisfactory counterexamples. Many of those usually cited involve the passage of time so that preferences change during the consistency test; that is, of course, entirely besides the point."

Tastes may, it has been argued, change frequently, and often in unpredictable ways. The person may not know whether he or she will prefer x to y at some future date, from the perspective of the present.

There have been psychological studies reporting intransitivity of preferences, one early and important one being Tversky (1969) [2]. This study will serve as a framework. It claimed in particular that in multi-dimensional choice sets, agents typically compared alternatives

1. See Hahn & Hollis (1979,p.4f) and Sen (1982b, p.3).

2 . Some early evidence is surveyed in Coombs,Dawes & Tversky (1970),pp.160-163. See also Pearce (1964).

dimension by dimension, rather than considered the combined value to themselves of each alternative considered separately. Agents then compared these overall evaluations. Furthermore, Tversky found that small recognised differences were ignored, even for important dimensions. These considerations were tested by creating appropriate gambles for subjects, and Tversky claimed that the results showed systematic, predictable intransitivities. The problem with the evidence is that it is in fact compatible with both the consistency axiom and the alternative, that consistency is expensive, and will therefore be sacrificed for other objectives if a conflict of sufficient cost arises. Transitivity, as Deaton and Muellbauer pointed out, can be rescued by an appeal to taste change. Despite replication of Tversky's results by, most notably, Ranyard (1976), and Lindman & Lyons (1978)[1], the empirical tests are not decisive.

These studies are controversial precisely because they are not decisive between alternative hypotheses. The axiom of transitivity is only indirectly testable. In principle there are two methods of empirical indirect testing. Either testing relates to actual observed behaviour, or subjects in specially designed laboratory tests can be presented with hypothetical choice problems. The former runs into the changing preferences problem already discussed, and the latter into problems of interpretation, as asking people to consciously order their preferences may lead to biases in choice since additional time is devoted to the problem and 'strategic' relevation may take place. One might however expect that subjects who are aware that their consistency is being checked, and who

1 . See for a survey of this evidence Slovic & Lichtenstein (1983).

spend time thinking about choices, might be more likely to act transitively, and thus evidence of inconsistency in the Tversky-type experiments would be more, rather than less, compelling than real world choices.

Critics of this type of study have laid stress on the context of choice, and how the observer and subject interpret it. For example, Luce & Raiffa (1957, pp. 25-6) claim that where likes and dislikes are vague and unclear, people make mistakes in their choices which, if pointed out to them, they revise. Further intransitivities occur in cases where inherently incompatible alternatives are evaluated over different attribute scales [1]. Other defenses of the transitivity axiom stress that it is an approximation, true in most but not all cases, and having useful heuristic value, or that the axiom represents some normative ideal. The final type of defense is to claim some deeper level consistency of preferences, which 'explains' apparent inconsistency at the superficial level. This is the line taken by Becker with respect to constancy of preferences over time, and then leaves him free to hold the transitivity axiom over time. To this we return in detail below.

Since the transitivity axiom is so important to traditional theory [2], and the maximising assumption in particular, it is perhaps worth trying at this stage to consider the relationship of the evidence to its theoretical explanations. The first point which emerges from our

1 . On the inability to make certain trade-offs, a contentious claim, see p.195 below.

2 . But see Becker (1962) on irrational behaviour and stable demand curves, resulting from the budget constraint alone, and the replies by Kirzner (1962 & 1963).

discussion is that, since empirical evidence is not decisive, we have essentially two paradigms [1]. The first sees all economic behaviour as inherently rational, in the sense of consistent, and interprets apparent inconsistency either as minor deviations from the norm of behaviour, or as mistakes in the evidence, and seeks some rationalisation within the axioms. The other paradigm sees behaviour as subject to much greater variance. People are not, in this view rational calculators, but rather limited in consistency, varied in preferences, and constrained by capacity in carrying out comparisons of alternatives. To decide between these, in chapter two a series of criteria other than empirical evidence alone were discussed. These criteria included classificatory scope, the extent to which ad hoc appeals were needed to explain supposed counterexamples, causal explanatory powers, feasibility and rationality as reasons for action. On these criteria there is sufficient doubt about transitivity to warrant consideration of the content of preferences, their origin and variance.

(iii) Completeness

Whereas the transitivity axiom demands consistency in comparison, the completeness axiom demands information on comparisons. It gives the theory scope which, when combined with consistency, produces the substantial form of the ordering. It abstracts from uncertainty, and thus neatly separates preferences from beliefs and belief-formation, discussed below in chapter five. It neglects the problems of searching amongst goods in order to discover one's preferences. Such a wide claim is to be contrasted with

1 . I do not wish to be at this stage committed to interpreting 'paradigm' as Kuhnian.

Simon's critique of maximising models, which essentially denies this axiom [1].

There are three possible interpretations of the completeness axiom: (i) agents do have completely ordered preferences; or (ii) they could in principle have such an ordering; or (iii) given any binary choice they could in principle express an R preference relation. Of these alternatives, denying (ii) implies the falsity of (i).

One kind of evidence is research into brain capacity which suggests that (ii) is false [2]. Simon has observed that (1977,p.159):

"Because the central nervous system can do only a few things at a time, and because the human memory and the human environment jointly contain an enormous amount of information potentially relevant to behaviour; it is essential that there exist processes to determine what tiny fraction of this totality will be evoked at any given moment and will, during that moment, constitute the effective environment of thought and behaviour. It must be possible to make decisions about what to attend to before making decisions about what to do about that which is being attended to."

and argued that there is no empirical support whatsoever for the possibility of complete preference orderings. Simon's objection is thus one of feasibility, in the sense of that this cannot be reason for actions.

1 . See Simon (1955).

2 . Newell & Simon (1972).

Denying (iii) would involve the suspension of judgement. In a full-information world, this means that some alternatives are incommensurable. The possibility of incommensurability arises in two cases; either some preferences cannot be compared with others and traded off, or there exists sufficient uncertainty such that belief is temporally suspended (either because not formed, or formed and suspended), pending new information. The former is discussed in this chapter below, and the latter in chapter five.

If the completeness axiom over the whole consequence space were to be dropped, and a subset of that space form the limit to choice, rationality would be 'bounded' or 'local' to that space; within the subspace an act could be rational in the sense of being the locally best available given the constraints, while globally not necessarily being so, in relation to information potentially available concerning other alternatives [1].

The problem is this: inferior choices are made at the surface level and indeed these may be intransitive. Comparing all alternatives globally and checking their consistency is expensive, such that the optimal choice, given the costs of information and of checking, may be to act inconsistently. Now in terms of the interpretation of behaviour, it may be claimed that at a deeper level, choice is in fact consistent. There are information costs, and the rational act requires that these costs are only incurred to the point where they are just offset by the rewards. The problem then is that ex ante the agent does not know what is the optimal

1 . On bounded rationality, see Simon (1957)pp.198-202. Analogously, a species may be well-adapted with respect to a local population and thus locally optimal, while not necessarily being so when invaded by another species.

subset over which to express a choice [1].

The notion of bounded rationality is of an agent using highly selective serial search procedures of the environment within a locality, without expanding his search to a wider possible total dimension. The specification of the limited sphere to which an ordering is applied is a complex problem in itself. One proposed method noted above is that of Simon's theory of satisficing (1955). That theory attempts to explain both the domain of choice, the local subset, and the method of search within it.

(iv) Other axioms

To produce an ordering which can be maximised, other axioms are also needed in addition to the main ones of transitivity and completeness. These include, depending on the precise purposes of the theory, reflexivity (which is relatively harmless in terms of feasibility), continuity, non-satiation, and sometimes convexity [2].

Since the intent of this thesis is to question enforced maximisation, and particularly with respect to feasibility and causality, our interest is on the major axioms and on the nature and content of preferences to which I now turn.

1 . There is a particular problem of equating marginal benefits and marginal costs of search, which is that it leads to an infinite regress. This point is developed in chapter five, p.255f.

2 . See for an exposition, Deaton & Muellbauer (1980).

4.3 THE NATURE OF PREFERENCES

Having argued that there exist good reasons for questioning the applicability of the axioms, but that the decision as to their acceptance was not a purely empirical one, there remains at least two major views of preferences. These are the ordinal utility theory on the one hand, and a much more complex and incomplete account which asserts, in March's description (1978,p.598), that:

"Human beings have unstable, inconsistent, incompletely evoked, and imprecise goals at least in part because human abilities limit preference orderliness."

In this section, in order to further investigate these two conflicting accounts of the same data, I suggest that considerations of evidence and explanations of changing preferences, acquired or otherwise, preference-revision in the light of new information, and preference reversals, is sufficient to warrant considerable scepticism of the ordinal theory, and to imply the need for a theory of preference formation. These arguments need to establish more than that there is a divergence between observed and assumed behaviour. Axioms or assumptions, I argued in chapter two, are of necessity simplifications, and thus can only approximate. These arguments and the related evidence are considered under the headings of 'endogeneity' and 'stability' below.

It does not however follow that because preferences are endogenous that they must be unstable. Indeed Becker, it will be seen below, holds endogeneity and stability simultaneously as part of his theory of enforced preferences. Preferences are for him biologically endogenous, but also

stable. Selection enforces stability. Thus to reject enforced maximisation in Becker's version, I shall need to argue for endogeneity, but against stability.

(i) Endogenous preferences: the origin of preferences

To claim that a concept is endogenous to an explanation (a model or theory) requires some causal explanation of why it assumes the value that it does. So the task of demonstrating endogeneity is one of giving causal explanations of preferences. What counts as decisive between the claims of exogeneity and endogeneity is the superiority of a particular causal explanation, plus reasons for thinking that these causes have significant implications for the understanding of behaviour.

If preferences are endogenous, they are not in themselves the initial conditions of economic explanation; rather the causes of them are. In the enforced preferences theory, these causes are genetic. Now endogeneity has typically been presented in the literature by reference to particular examples. These include advertising, interdependence and social conditioning, acquired and learnt tastes, and addiction. Each example purports to demonstrate that there exists some cause or causes, itself part of the explanatory scheme or model, which determine weakly (in the sense of partially cause) the observed preferences. From the examples, it is then argued that these cannot be taken as given.

More generally Stigler and Becker (1977) have attempted to recapture all these cases within the framework of human capital theory and the economics of time. These examples are in fact open to interpretation in both of our paradigms, the maximisation of utility and a more pluralistic

approach. Each paradigm has associated with in what Lakatos (1970) would call a "positive heuristic", which here may be respectively described as "search for a description of the objects of choice for which preferences are exogenous" and "search for endogenous causes of preference change". I shall first consider briefly the examples, and then examine the general defence of Stigler and Becker. It will be shown how far the first heuristic needs to be stretched, and thus how much rewriting of the objects of choice is required.

(ii) Rival interpretations of apparent endogeneity examples.

- (a) Example One: Advertising

Perhaps the most frequently invoked example in this context is advertising, which is argued to have in addition to informational content to aid choice on existing stable preferences, persuasive effects altering preferences [1]. The central concern is that of consumer sovereignty, whether the Chicago view of the individual or the more pliable view of human nature is correct [2]. No one doubts that advertising frequently alters choice; the question is whether it alters preferences. The Chicago position is that all advertising is pure information, and that if consumers prefer advertised goods it is because it is cheaper, from their point of view, for the firm to provide information about the product to them in certain circumstances, rather than for each consumer to individually engage

1 . Studies which suggest that advertising has persuasive qualities include Packard (1957), Galbraith (1958) (1967, pp.266-67) and Mishan (1971).

2 . See Reder (1982). The Stigler & Becker solution discussed below is in this tradition.

in search activity. The justification for this claim is that, because consumers express a preference for advertised goods over non-advertised ones, they therefore reveal a preference for information. It is assumed that people will never purchase something which does not contribute to their utility. Hence agents could never be persuaded to buy something for which they had no positive resulting expected utility benefit. The argument is thus one by assumption: it is assumed that consumers cannot be persuaded, and then shown why they cannot, given the assumption.

Another related defense concerns the idea that advertising is directed towards characteristics bundles [1], and not the goods themselves. Tastes for characteristics may remain constant while choices over goods alter. What has altered in choice alters by the advertising change in the characteristics for the goods. For example the demand for goods which are "fashionable" may remain constant, but different goods may have this characteristic at different times, and the indicator of "fashion" may be conveyed by advertising. Thus preferences over characteristics remain constant, but because a good plus advertising is not the same as the good without advertising (in terms of characteristics attributable to those goods), choice is - without inconsistency or implausibility - altered.

This second argument leads however to a difficulty: observed differences in choice in the face of advertising are not decisive between exogenous and endogenous interpretations. The issue is not then an empirical one of differing predictions, but rather of which provides a better description and explanation of the same choices, and thus the

1. See Lancaster (1971) for the classic exposition of this approach to consumer behaviour.

alternative paradigms rest on our causal criteria of chapter two, particularly feasibility.

- (b) Example two: Interdependent and strategic preferences.

Some preferences depend on others' response to one's own choices. Examples of these include snob value [1], bandwagon effects [2], and positional goods [3]. The maximising choice in each of these cases is interdependent on others' maximising choices. Furthermore others' maximising choices is dependent on the first individual's behaviour. The preferences underlying the choices produce these difficulties because of their social direction. It may be that the desired characteristic is relativistically defined, as in the example of social scarcity (Hirsch's positional goods), social conformity, relative income group conformity [4], or some combination of these. In each case, the preferences of agents are prima facie endogenous, and agents cannot be viewed atomistically with respect to their social environment from which they derive at least some of their preferences.

But again, as in the advertising example, there is a reinterpretation within the exogeneity paradigm. For it is open to the defender of exogenous preferences to argue that a distinction can be made between what might be called basic and strategic preferences. By basic I mean

1 . Veblen (1925).

2 . Leibenstein (1950).

3 . Hirsch (1977).

4 . As in, for example, Duesenberry's relative income hypothesis (1949).

precisely those preferences which are not derivative from any others (of which the primary ones which sociobiologists use are survival and self-interest), and remain constant. The reinterpretation is a re-definition. In the above case, the argument would be that social preferences can be interpreted as a basic preference for social approval, admiration, or whatever is the appropriate psychological desire on the one hand, and a derived, contingent preference for a particular good which happens to have the right characteristics. The deep or basic preference for social status remains constant, while the derived preference for particular goods varies with changing social scarcity and institutions. Different choices in different periods may satisfy the same deep preference. To use the same example as in the advertising case, but to give a different explanation, the preference to be fashionable may remain constant while items of clothing which satisfy it may alter.

- (c) Example three: Acquired Preferences.

A third case of apparent endogeneity is the acquisition of preferences, where these are related to previous consumption. Marshall [1] gave the example of the taste for music, arguing that an exposure to 'good' music increased the hearer's appreciation of it, hence increasing demand. But just as acquisition might be beneficial in the Marshall case, it could equally work the other way, with addiction to drugs, tobacco and alcohol. These examples have received more recent attention from von Weizsacker (1971,1983), from Peleg and Yaari (1973) and from Stigler and Becker (1977). The von Weizsacker model relates preference to lagged

1. Marshall (1920),p.91.

previous consumption, while Stigler and Becker have taken a quite different view, arguing that by incorporating the economics of time into the cost constraint, and considering the human capital acquisition in learning to appreciate such goods, preferences remain constant, but the marginal productivity of time rises, 'explaining' the apparent change in choice of allocating time. This latter substantive defense, allowing for the possibility of enforced maximisation, is examined in detail below.

Finally mention should be made of the argument, put forward by Cyert & DeGroot (1975) that experience might alter a person's knowledge of their preferences, without changing their underlying utility function. Experience represents in this view new information rather than an alteration of preferences.

[Digression on the levels of preferences: individuals and society]

Having considered interdependence and preference acquisition, I now digress to consider the social influences which might effect individual preferences, and hence the level of preference selection, before turning to the fourth example of endogeneity - choosing preferences.

Interdependence of choices is the result of the social rather than individualist part of man's existence. But specifying the degree to which an explanation of behaviour needs therefore to be orientated towards society rather than the individual is not straightforward. In the methodological literature (and this is a methodological problem) the issue turns on the validity or otherwise of 'methodological individualism'.

In its extreme form, methodological individualism is reductionist to a single identifiable ultimate unit of explanation. For what is required is

a definition of the individual unit around which explanation is to be constructed, and that unit must not be composed of a series of separable parts. In the social sciences, there have been a number of candidates for this role, though none has been shown to be ultimately incapable of further decomposition. They include the gene, the person (phenotype), and society [1]. Stress on individuals as against society has two interpretations: one stressing that explanation is to be conducted in terms of individuals, and the other stronger methodological claim that individuals are separable from society in the sense that they are not determined in their behaviour by the social. While the primary form allows for strategic behaviour and social interaction [2], the latter is quite prohibitive of social terms in explanation. Concepts like class can have no meaning in the latter form of explanation. Social concepts, or 'wholes', vary considerably in their scope and application, and as Mackie (1978,p457) has pointed out:

"Some wholes are obviously more accessible to us than their components. We can understand what a human being does without analysing this in terms of how each cell in his body or his brain behaves. Equally we can often understand what a human society does without analysing this in terms of the behaviour of each of its individual members. And the same holds quite generally: we can often understand complex wholes as units, without analysing them into their parts."

Amongst the numerous issues which arise in this context, I am here only

1 . See ch.2, section 2.2, on the components of evolutionary arguments, esp. pp.32-34.

2? See Becker (1974).

concerned with one aspect, namely that the social has influence over the individual, and particularly with respect to the choice of preferences. I want to advance a weak claim, that preferences are influenced and thus in part learnt from the environment [1]. Such influence need not however be all encompassing, for it turns out that even such a weak form of influence creates great, if not insurmountable, difficulties for the utility maximising model [2]. Of course, should the social be more important in the stronger determining manner, then the model will be further undermined. However the concern here is only with the minimum social influence necessary to question its force.

This weaker position recognises that it is the individual who does the acting, and that he faces a society within which the consequences of his actions will be partially determined. This society may exist as an entity, or it may be that the agent believes that it exists as a way to accommodate, organise and categorise the immense amount of diverse information presented to him. In other words, a person may usefully think in terms of collectives like armies, schools, unions, firms and so on simply because in that way he can comprehend, whereas if he were to try to isolate and understand all the individuals which make up these collectives, the limits of his ability to cope with the amount of potential information available would soon be reached. But since people think in terms of these

1. The evolutionary argument relies on environmental selection on genes and then to preferences, so in part I am appealing here to that sort of argument.

2. It follows from this result that methodological individualism and the maximising utility model are not accidentally coincidental in both utilitarian and post-utilitarian thought. On this point, see the discussion above in chapter three on Mill's concept of political economy, p.91 f.

collective terms in forming their beliefs, these form reasons for their actions. They can therefore act as causes of behavioural choices. Hence the world is altered because people act 'as-if' collectives existed.

Interdependency of choice may be recognised or unrecognised. It may be the case that decisions taken in isolation for individualistic reasons, taking others' choice as exogenous, do not result in desirable utility consequences to the extent imagined, if others are choosing similarly. Cooperative solutions often dominate non-cooperative ones [1]; the problem is however that these frequently turn out to be unstable [2]. There are two issues which arise in this context with interdependency: first that the possibility of gains from strategic behaviour can be considerable [3], and second there may be an individual/aggregate inconsistency.

In the former case, it is clear that maximisation by direct policies can frequently be inferior to indirect methods. Gauthier (1975,p.418) has argued that:

"It is rational to maximise one's utilities, but it is not rational to do this by a straightforward policy of individual utility-maximisation. In examining the connection of rational activity and maximising activity, this paradox must be elucidated."

But also, in the latter case, what individuals maximally choose in isolation may not equal the maximal outcome in utility terms potentially

1. In oligopoly theory this is a standard result; see Osbourne (1976).
2. The incentive to free-ride where information is imperfect may frequently be quite strong.
- 3 . See Schelling (1963) and Vickers (1985).

available at the aggregate level. As Schelling (1978a,p.19) states it:

"How well each does for himself in adapting to his social environment is not the same thing as how satisfactory a social environment they collectively create for themselves."

The utilitarian ideal that rational self-interested individuals acting collectively will produce what is the collective purpose by virtue of each individual's self-interest is thus questionable. At this stage I do not however comment on the generality of these phenomena.

Often in the literature, one finds the weaker implicit or explicit assumption that people tend, if not already in it, to act such that there is a tendency towards the socially optimal state. Indeed it is sometimes claimed that, if recognised, it is irrational to act otherwise. Hirschleifer, for example, in reviewing Schelling's book quoted from above, claims that there are "compelling forces towards convergence in many social decisions". Elsewhere in the rational expectations literature, which I discuss much more fully in the next chapter, it is claimed that people will converge on the perfect foresight equilibrium because they would not willingly participate in an explosive economy [1].

The substantive issue of collective and individual rationality, and the level at which enforced maximisation operates are reflected in the sociobiological difficulty of explaining the development of group altruism

1 . See Begg (1981,p.31f.). The argument against this perfect foresight path is that, since the probability of just one individual acting irrationally is quite high, and only one act of irrationality is required to destabilise, each agent should expect the saddle-point to be unattainable, and thus act other than the way required to bring it about.

for maximum social as against individual gain. The reciprocal altruism justification does not guarantee social optima being attained. Explaining the possibility of altruistic behaviour arising does not guarantee the 'right' level of altruism is attained. As will be seen later in this chapter, there does not seem to be any persuasive reason for this 'social rationality' at the individual level. If it is rational, then it is in some (non-preference maximisation) moral sense; the justification as rational comes from outside the model it claims to support.

Our two paradigms deal with these cases of interdependency in different ways. The utility maximiser resorts to re-specification of the constraints, paying careful attention to strategic pay-offs, and to possibilities of reciprocal altruism. The other view stresses the limitations of objectives which result from these complexities, and motives other than self-interest to explain how social behaviour is possible in a wider interpretation of altruism.

- (d) Example four: Choosing Preferences

The last section raised the possibility of wider preferences including response to strategic considerations, and social goals. Values and preferences come from somewhere: either innate or acquired. Most children derive them from a combination of their parents and their social environment rather than from genes [1].

There are two questions which should be considered here: whether choice over values is possible at the individual level (whether these are

1. Allport (1958), Coles(1977), reported in Akerlof(1983).

genetically determined), and if such choice is possible, what set of values an individual would choose. Subsidiary to this problem is whether or not individuals, in the case where they prefer to have preferences other than their own (for example the smoker wanting not to want to smoke) might appoint an agent to make these choices for them [1].

An important discussion of the choice of values is provided by Akerlof (1983). He provides a number of cases claiming to show that as people go through different experiences, their loyalties alter. Loyalty filters have important implications, Akerlof argues, for the ways in which individuals and institutions attempt to reach specified goals. Effectively, Akerlof is distinguishing between different types of preferences, along the lines of our above distinction of basic and other preferences [2]. For him the basic preference is the goal of wealth maximisation [3]. Let us consider one of Akerlof's examples. It concerns whether parents will attempt to instill the value of honesty in their children. The model concerns the labour market, and the returns to honesty and to honest workers.

Assume:

(i) one job type, producing output y

(ii) parents have a choice between children being honest or dishonest

1. The choice of democratic choice rules may be more general examples.
2. See p.145f above.
3. Akerlof assumes that selection operates on individuals, not societies. Matthews (1981) discusses the necessary values, such as honesty and trust, needed for market competition to succeed. See discussion of this below, p.190

(iii) risk neutral competitive employers

Let:

y = output from work

x = possible embezzlement amount

q = probability of embezzlement x

$u(.)$ = utility function of worker

ch = cost of training children to be honest

dishonest worker's wage = $y - px$

$E(u) = (1 - q)u(y - qx) + q.u(y + (1 - q)x)$

honest worker's wage = y

net income = $y - ch$

$u = u(y - ch)$

therefore:

parents train children to be honest if:

$u(y - ch) > (1 - q)u(y - qx) + q.u(y + (1 - q)x)$

Loyalty filters and the choice of preference may act to aid the achievement of goals: it is explicitly assumed by Akerlof, and never questioned, that the maximisation of individual welfare is the objective to which preferences are adjusted. Akerlof's problem can be considered as one in which individual welfare forms a higher or meta-goal and that

preferences may be adapted to meet it. In this respect it follows Cyert & DeGroot's (1975) suggestion that utility, as well as beliefs, adapts to new information.

Policies such as honesty and loyalty are means to the achievement of this assumed goal. Thus some preferences are altered and thus alterable, but not all. However it remains to argue two points. The first is the extent to which individuals would wish to choose to maximise their children's welfare in the narrow sense of wealth. This is an example of the more general question which is the concern of the rest of the chapter, where altruistic behaviour is essentially self-interested. The second concerns whether the adoption of rules of thumb, such as strategic preferences like honesty, is interpretable as maximising behaviour or whether it represents satisficing conduct, given the extent and nature of information available and the beliefs of individuals. Akerlof's case is informationally extremely demanding. People typically do not know in advance their offsprings likely career, and hence the relative payoffs of the two strategies. Honesty might be generally the superior strategy, but in particular cases inferior. And because one strategy - say honesty - can be shown to be superior to another, it does not follow that it is a maximising strategy. Nor does it follow that selection will favour a general rule or mode of behaviour where it leads in some cases to short run elimination.

Some types of preference may be less open to choice than others. The sort of case I have in mind relates to the example above of the smoker who might prefer a cigarette over some available alternative, and prefer not to want one. Cases such as these, which may involve addiction, where deep

preferences conflict with superficial ones, are more difficult [1]. The question "what sort of person would I like to be?" might be interesting in itself. But for our purposes the interesting analytical issue is whether that choice can actually be made. To an extent these kinds have simply been assumed away: since actions depend partially on the reasons for them, and reasons are not fully determined. The extent to which certain beliefs are determined, in the sense of selected for and against (such as rational expectations dominating other kinds of expectations) are discussed at length in the next chapter. With regard to the sort of cases alluded to above, it is sufficient for us to show that some preferences at least are matters of choice, and that included in the choice set is self-interest, and some alternatives to it.

1. See Winston (1980).

(iii) Preference stability

It will be remembered that the model of behaviour resting on preference orderings derived under the axioms of choice discussed above is developed statically. Discussing preferences over time introduces two complexities: first, since the future is uncertain, preferences refer to expected rather than actual utility outcomes; and second, preferences and tastes alter over time. Both make consistency of choice over time a more complex notion. Preferences for goods are contingent with respect to time, and beliefs about states of affairs depend upon the available information set at points in time. Thus all goods must be dated, and specified with respect to the subjective beliefs of the person considering them. This process of redefinition is an integral part of the traditional theory of consumer behaviour: utility from goods is person- and time-specific so that apparent inconsistencies in choice behaviour can be explained by subjective characteristics changes. Transitivity, it was noted above (p.133), is defined at a point in time, and holds dynamically only if tastes are held constant.

- (a) Interpreting instability

In this section therefore the problems associated with preference stability over time are discussed. There are three possible methods of dealing with the issue while maintaining the traditional theory of choice:

(i) assume that preferences are constant over time as an approximation, noting that such changes as do occur are exceptions;

(ii) provide a theory of how preferences change over time, so that the causes of the changes then become themselves the exogenous variables in the

model, rather than the preferences themselves;

(iii) claim that preferences are unnecessary to explanation of stable behaviour, as posited separately in some sociobiological explanations, and by Becker (1962).

It is a central contention of this chapter that a strong sociobiological explanation is not sustainable. Constant tastes is of course only an assumption, and the justification of assumptions is that they provide simplifications which make for both analytical tractability and approximate to the actual behaviour of people. Assumptions require causal correspondence rules, as claimed in chapter two above. Finding some cases of endogenously changing tastes does not of itself invalidate the constancy assumption. The question is thus whether preference stability is the rule to which there are some exceptions, or whether preferences are quite generally endogenous and unstable. For example it may be argued that the rate of change of tastes is slow, such that although in the long run tastes are not constant, for the short period analysis the model is quite adequate. On the biological account of the evolution of tastes, it has been pointed out that since mankind has been evolving for several million years, it is unlikely that changes in tastes would occur within the period of time covered by the data which may be considered in testing particular economic hypotheses [1]. To this point may be added that since we know so little about the direction and causes of preference change, the best guess is the assumption of constancy.

Endogenous preferences are not, it is to be remembered, necessarily

1 . Rubin & Paul (1979).

unstable preferences, though establishing endogeneity is a step towards questioning stability insofar as that stability would require a justification under endogeneity whereas it would not under exogeneity and thus directly constancy. Endogenous preferences could be constant, or the process generating them might itself be a stable one [1]. Further it should be noted that even if preferences are unstable it does not immediately follow that choice behaviour itself will be unstable [2], though if this were the case the uniqueness of the relationship between preferences and actions would have been broken.

Evidence that preferences are unstable is not then conclusive for either of our two paradigms, the traditional and the more complex. From the discussion in chapter two on the status of empirical testing, it could not be so. However it does give rise to reasons for believing that there might be instability, in that the evidence needs to be rationalised within the available theoretical frameworks. This evidence comes in several forms, two of which concern intransitivities and preference reversals. Intransitivities have already been dealt with above (p.000f); thus in this section I shall concentrate on preference reversals.

- (b) Preference reversals

Inferring preferences from hypothetical choices involves a judgement about beliefs as well as preferences, since it is the combination of these two sets of reasons for actions which produce the act. Thus the evidence

1 . As in the theory advanced by von Weizsacker (1971) for example.

2 . Peleg & Yaari (1973) and von Weizsacker (1971). Note also that there are equilibria with intransitivities.

which I now discuss spans both parts of the enforced maximisation hypothesis, and overlaps with the next chapter.

Preferences that are reversible are not stable, since transitivity over time is weakened. The literature on such reversals is large. Lindman (1971) in an early study claimed to demonstrate that preferences may be inconsistent between gambles. He considered the case where an explicit choice between two gambles, x and y , resulted in $x P y$, but where this choice coincided with simultaneously a lower reservation price being attached to x rather than y when the subject considered the gambles x and y in isolation. Explicit choice focuses on the probability of winning; reservation price depends on the amount of the winning. Similar evidence has been presented by Lichtenstein & Slovic (1971, 1973), Grether & Plott (1979), Pommerehne, Schneider & Zweifel (1982), and Reilly (1982). The remarkable fact about these studies is the extent of replication of the reversals. As Slovic & Lichtenstein (1983, p.599) note in surveying the evidence:

"The most striking result of these studies is the persistence of preference reversals in the face of determined efforts to minimize or eliminate them."

The importance of this evidence, and its validity, is contentious. Though there is this evidence to suggest that preference reversals do in fact occur, it has not been conclusively shown that this type of behaviour is frequent, and in particular, frequent enough that the assumption of its non-existence diverges sufficiently from the majority of cases to require that the origin and stability of preferences be questioned. To be convincing an explanation of why such behaviour occurs is required, and as

Schoemaker (1982,p.546) has pointed out, no adequate explanation has so far been provided. It is however worth noting that advocates of the traditional theory have not in this case provided a re-interpretation of the apparent axiom violation, whereas in all the other cases considered here this has been done.

Let me suggest one possible explanation. It may be that different types of preference and belief are involved. Preference reversals represent a combination of guesses about both future consequences and future preferences. Suppose that preferences existed with respect to monetary gains from gambling expressed in sterling currency, while other preferences reflected the need for security, here reflected in reservation prices. The inconsistency of preferences manifest in this reversal might reflect the tension between these different types of preference. Such an hypothesis derives from a much richer theory of preferences and their origins, and of course is ruled out by the treatment of preferences as exogenous. Beliefs about future states, about which I shall have more to say in the next chapter, might vary in kind. Preference bundles, on this view which I am here advancing, would then be seen as the complex bundles of outcomes of different types of preference and beliefs.

Finally, Becker (1962) argued that, to take the third method of dealing with unstable preferences listed above, one of the central results of traditional consumer theory concerning downward-sloping demand curves, does not require maximisation or stable preferences, but follows from the scarcity of resources. Teleological assumptions are, on this view, unnecessary. Becker argued that by consideration of budget constraints, and assuming all market participants are price-takers, the major theorems

of modern economics could be derived without the assumptions of the traditional ordinal theory. More will be said about this article below [1] since the central non-teleological claim goes to the heart of the validity of sociobiological explanation in general, and enforced maximisation in particular.

This section has considered the claim that preferences are unstable, the principle responses to this claim, and shown the difficulties of sustaining these responses. This lends some support, but not of course proof, that they might be thought of in this unstable fashion. In the chapter so far, I have presented a critique of the traditional ordinal theory from a number of directions, and seen how various counter-examples have been reinterpreted within the traditional axioms. In the next section I consider the major response in the literature presented by Becker, both in his own right and in conjunction with Stigler. In doing so some of the principle difficulties with reduction will be highlighted. Becker claims, as shown in chapter three above, that economic analysis is universal, that people do have constant tastes, and that these tastes are self-interested. Behind each of these assertions Becker has in mind a sociobiological explanation as he explained in his (1976a) article reviewing the relationship between economics and biology. His is a reductionist explanation explicitly used to defend enforced maximisation.

1. See p. 174f.

4.4 REINTERPRETATION IN THE MAXIMISING FRAMEWORK

Section 4.3 considered the nature of preferences, and the arguments and evidence for considering them to be endogenous and unstable. The way in which each of the examples presented could be interpreted in each of the two paradigms was preliminarily outlined. I now consider more generally how these apparent observations have been argued to be comprehensively reinterpreted in the traditional framework. This general reinterpretation has been proposed by Stigler and Becker (1977), and it is their model which I shall concentrate on. Their argument for constancy of preferences is one of the fundamental problems for reductionist explanation. Another is that of the unimportance of reasons in explaining human behaviour argued for by Becker (1962) and referred to above. Once these reinterpretations have been discussed and rejected, the way is clear to consider in part two of the chapter the remaining enforced maximisation argument for preferences - altruism and self-interest.

(i) Human Nature and the constancy of tastes

Stigler and Becker in their article entitled 'Das Gustibus Non Est Disputandum' have argued the case for the proposition that (p.76) "one may usefully treat tastes as stable over time and similar among people". Their argument is constructed in the following way (p.77):

"To support out thesis we offer samples of phenomena we believe to be usefully explained by the assumption of stable, well-behaved preference functions. Ultimately, this is indeed the only persausive method of supporting the assumption, and it is legitimate to cite in support all of the existing corpus of successful economic theory ...

We take categories of behaviour commonly held to demonstrate changes in tastes or to be explicable only in terms of such changes, and show both that they are reconcilable with our assumptions of stable preferences and that the reformulation is illuminating."

The methodology is quite remarkable. It involves the claim that the maximisation hypothesis is only justified by its usefulness (an instrumentalist claim) and that existing theory is successful. Fundamentally Stigler and Becker adopt a Friedmanite instrumentalism: useful theories are those which yield good predictions [1]. Yet Becker adds the additional claim that the theory is also a good explanation, and by this he means in particular that the assumption of constancy of tastes, and generally the axioms of ordinal preference theory provide an accurate description of behaviour. It is a descriptive accuracy which leads to 'good' predictions for Becker, whereas Friedman was concerned precisely to deny that accuracy in description has anything necessarily to do with the 'goodness' of a theory [2]. By 'goodness' Friedman meant only predictive accuracy; hence there was no necessary connection between realism of assumptions and the goodness of predictions. No direct appeal is being made here to a sociobiological defence; indeed such a defence is implicitly denied as methodologically valid. This brings out an interesting conflict. For, as was noted in chapter three, Becker (1976a) appeals directly to the sociobiological basis for utility maximisation. Yet in Stigler & Becker (1977) no such direct appeal is made in offering a general

1. See the discussion of this in chapter two above, pp.40-41.

2. Friedman actually suggests that the more unrealistic the assumptions, the more interesting is the theory (1953), p.14. See again in criticism Helm (1984b).

reinterpretation of the examples in the traditional framework. I shall now show that these are inconsistent, and in the process highlight a central problem of reductionist explanation of preferences according to the enforced maximisation hypothesis. For it is here that one would expect a direct appeal to evolutionary defenses. Becker uses inconsistently utility maximisation as an 'as-if' explanation and as a description of actual behaviour, ie. he uses teleological and functional rationality inconsistently. As will now be seen, a direct appeal is made in redefining the utility function to reasoning patterns, and in particular what optimising agents would have good reasons to do. Hence we can apply in criticism our feasibility criterion from chapter two.

Let us consider one of the Stigler & Becker proposals, to see the method in action [1]. The first case they consider is of the taste for music which, as was seen above, Marshall amongst other has argued to be an acquired one. Stigler and Becker effectively argue that the listening to music is a form of investment in what they describe as 'consumer capital'. Their model is:

Let:

- M = amount of music 'appreciation' produced and consumed.
- Z = production and consumption of all other commodities.
- t_m = time allocated to music.

1. The cases they look at are music, addiction, habitual behaviour, advertising and fashion. These examples have different characteristics, and to the extent that Stigler and Becker subsume them under the same explanatory scheme implying the importance of these are lost.

- S_m = training and other human capital conducive to music appreciation.
- M_j = amount of music appreciated at time j .
- E_j = measure of the effect of education and other human capital on music appreciation skill.

π = shadow price

1. Assume $U = U(M, Z)$

2. Assume $M = M(t_m, S_m)$

3. Assume $\frac{\partial M_m}{\partial t_m} > 0$; $\frac{\partial M_m}{\partial S_m} > 0$

4. and $\frac{\partial^2 M_m}{\partial t_m \partial S_m} > 0$

5. $S_{mj} = h(M_{j-1}, M_{j-2}, \dots, E_j)$

additional beneficial if

$$\frac{\partial S_{mj}}{\partial M_{j-r}} > 0, \quad \forall r \text{ in } (5)$$

6. Assume $\frac{\partial S_{mj}}{\partial E_j} > 0$

and $\frac{\partial^2 S_{mj}}{\partial M_{j-r} \partial E_j} > 0$

7. Optimal allocation of consumption where:

$$\frac{MU_{mj}}{MU_{zj}} = \frac{\partial U}{\partial M_j} / \frac{\partial U}{\partial Z_j} = \frac{\pi_{mj}}{\pi_{zj}}$$

Effectively Stigler and Becker redefine the taste for music by separating out consumption of music from the problem of attaining human

capital to satisfy that taste. The theory of addiction is hence not the changing of tastes, but rather one of the marginal conditions for allocating time to acquire the appropriate human capital. As they put it (p.79):

"The marginal utility of time allocated to music is increased by an increase in the stock of music capital. Then the consumption of music could be said to rise with exposure because the marginal utility of the time spent on music rose with exposure, even though tastes were unchanged."

There are immediately a number of difficulties with this procedure. For what is being done is to claim that the attempt to look for causes of changing tastes is misdirected, since the tastes themselves are misspecified if the costs of producing utility are ignored. Stigler and Becker when faced with apparent contradictions, appeal to deeper preferences and rewrite the utility function [1]. A progression of increasing specificity can be presented to reflect this:

Simple ordinal utility function:

$$U = U(x_1, \dots, x_n)$$

where x_i = good i

1. These are only some of the possible variants, and are used here by way of illustration. In particular it should be noted the the ranking of commodity bundles according to utility is not the same as ranking preferences. These examples rank the objects of choice; the nature of preference or desire could similarly be distinguished. See on this Sen's capability approach as outlined in (1982a) and (1984).

Characteristics utility function:

$$U = U(c_j, \dots, c_m)$$

c_j = characteristic j

Dated subjective utility function:

$$U = U(x_{t1}, \dots, x_{tn})$$

or with characteristics:

$$U = U(c_{t1}, \dots, c_{tn})$$

Human capital/ price of time utility function:

$$U = U(Z_1, \dots, Z_m) \quad \text{where } Z_1, \dots, Z_m \quad \text{and } Z_i = f_i(x_i, t_{hi}; E_i)$$

x_i =goods; t_{hi} = time used in consumption; E_i =human cap.
The first difficulty with this deeper and more complex utility function

is the assumption that people actually know their new deeper utility function. For if I know before I ever listened to classical music ex ante that I would definitely like it, but that I would have to listen to a certain amount first to acquire the taste for it, then the rational act would be as defined by the optimal condition stated above. The problem is that ex ante I am uncertain about the deeper taste about music. I have to try it in order to discover whether I have a preference for it. If the utility function is uncertain, two solutions are available. Either the individual knows enough about the situation to think intelligibly about the probability distributions of possible preferences for music or he does not. It seems highly unlikely that the former is true; indeed that, for example, is one of the justifications for enforcing an education on children without their consent.

Stigler and Becker use the human capital account to reinterpret supposed accounts of unstable preferences. Ultimately the difference between their approach and that which stresses instability is not explained by their procedure. It is a matter of the content of utility functions. Differences over content and the revision of preferences is a matter of how mental states are classified: redefinition will not, of itself, decide the issue. Rather reasons for preferring one classification over another are required.

The second problem derives from evolutionary considerations. For although Becker in particular welcomes the sociobiological explanation of self-interest, as will be seen in the second part of this chapter, in this article with Stigler he makes no use of this approach in discussing preferences. This would be inconsistent unless a special reason could be given for either excluding preferences from selection, or explaining why the selective process should produce constancy.

In contrast to Stigler and Becker, the evolutionary approach might be deemed to see human nature, and particularly tastes, as maleable rather than fixed with respect to environment and the passage of time. This influence is most strongly seen in the writings of Marshall, who as was noted in chapter three, saw close affinity between the methods of economics and those of history. He wrote (1920,p.764)[1]:

"At last the speculations of biology made a great stride forward: its discoveries fascinated the attention of the world as those of physics

1. See also Marshall (1898) and Trigg (1982).

had done in earlier years; and there was a marked change in the tone of the moral and historical sciences. Economics has shared in the general movement; and is getting to pay every year a greater attention to the pliability of human nature, and to the way in which the character of man affects and is affected by the prevalent methods of production, distribution and consumption of wealth."

If man is to be more pliable with respect to his environment, then one would expect the assumption of constant tastes to come under pressure for revision. Marshall was well aware of this. Using what we can infer to be Mill's distinction between higher and lower pleasures [¹], he argues that as income rises, so does the taste for variety (1920,p.73):

"As, however, man rises in civilization, as his mind becomes developed, and even his animal passions begin to associate themselves with mental activities, his wants become rapidly more subtle and more various; and in the minor details of life he begins to desire change for the sake of change, long before he has consciously escaped from the yoke of custom."

These arguments would suggest the converse to Stigler and Becker; that tastes are not simply related to income, but also to the amount of time spent in their pursuit. To the extent that time spent in leisure represents time foregone in employment, and hence has an attached cost [²], this reduces to income. In other words it is open to argue that even if there is a Becker effect by incorporation of these examples into the

¹ . Mill(1863) ch.2. See p.200 below.

² . Becker (1965).

household production function, it does not follow that all the effect can be so redescribed. The economic theory of time may be important in explaining some consumption activity; but it does not follow that there is therefore no change in tastes. While it is not the concern here to propose a theory of precisely how preferences might change under selection, it remains plausible to assert that some preferences are more likely to lead to survival than others. But whether preferences lead to positive or negative increases in survival potential depends on the selection mechanism. Marshall's point is that with the passage of time, selection alters. Thus a preference which elicited benefits to the individual in the Stone Age may not be conducive to survival now. For example, as will be seen in the next part, altruistic acts have a higher chance of reciprocation if appropriate institutions have developed, and contracts can be enforced by a legal system.

The sources of tastes can be divided into two: genetic or environmental. This distinction with respect to the individual, has spawned a vast literature on the nature/nuture dispute in psychology [1]. But our interest lies strictly with respect to the constancy of tastes argument in economics. Endogenous preferences could be constant preferences as pointed out above, and therefore a defense could be constructed of tastes converging by genetic selection on an identical set for each individual. Not only are some tastes more conducive to survival

1. Besides the need to demonstrate a genetic causal factor in behaviour, the environment influence may itself be ultimately genetically determined. The human species provide a further problem: the extent to which culture can be reduced, the extent to which it depends on its history. See on this B.Williams (1983) p.558. The intermix of the two factors might be argued to have made the nature/nuture distinction largely irrelevant.

than others (the case considered above), but since genetic change via replication is relatively slow [1], a good approximation is both identical and constant tastes across individuals. This would form a defence of Stigler & Becker's position, and a reply to Marshall even if their household production function argument did not cover all taste changes.

The problem with genetic versus environmental taste determination turns on the use of a Darwinian as opposed to Lamarckian evolutionary concept. The claim that "a large element of tastes are undoubtedly biological in origin" [2] does not in itself tell us very much. If tastes are acquired in a Lamarckian [3] fashion, then change could be very much faster and more frequent, undermining the defence of approximate constancy. The argument is then partly one of fact, which does not favour the constancy argument. While Guha (1981, p.25) has claimed that [4] genetic heritage counts for little in man because "the human brain and the nervous system at birth are infinitely more immature - relative to their adult stages - than those of any other animal", this is not a unanimously held view held by biologists. For Guha:

"The bulk of the human brain grows and most of the paths and interconnections of the nervous system form long after birth, when

1. See pp.28-29 above.

2 . Rubin & Paul (1979,p.587).

3 . The use of the Lamarckian idea is either a theory of environmental effects or it is used as an analogy. Since Darwinian theory is decisively better as a genetic explanation, the Lamarckian argument cannot be used in biological theory.

4 . See also Williams (1983,p.558) on the importance of culture, conventions and history in explaining human behaviour.

external stimuli are already reaching them. Hence the prolonged dependence of the human infant on his environment, his vast capacity for learning, and the unique role of experience, particularly early experience, in moulding him ... Wants are learned, not innate."

Although this would seem to be more persuasive, it is important to realise that the defence which Stigler and Becker construct depends on an appeal to deeper constancies. When an example of apparent preference change occurs they effectively rewrite the utility function at a deeper level. It always remains open to them to answer the question of what is constant by an appeal to some deeper notion of instincts or drives which are (more plausibly perhaps) genetically inherited. The term 'preferences' is a covering term in economics for a variety of concepts including drives, wants, desires, tastes and needs. However this continual redefinition of the utility function can be checked against the feasibility criterion from chapter two. An explanation, it was argued there, involves stating the appropriate reason for that act. One reason for an act is a preference, which in Davidson's terms is part of a 'pro-attitude'. If the relevant preference changes then so does the explanation of that act. Therefore even if there were (and there is no decisive evidence to support this claim) deep structural constancies in human nature, preferences (the proximate preferences) would remain effective causes, and hence surface level changes in preferences would continue to produce instabilities. Furthermore the relationship between surface and deep level preferences would need explaining.

Finally it should be noted that there is no reason given in the literature to suppose that constancy is on average true of the aggregate of

behaviour, such that a representative individual might be chosen to represent the population.

The reasons why people act as they do may be applied to preferences and values. People may, to a limited extent, choose their preferences. Certainly children are frequently deliberately exposed to experiences from which it is assumed that their preferences will be formed. I next consider what the theory of choice might add to preference selection, without the assumption that the preferences which determine action necessarily derive from the basic constant preferences which Stigler and Becker adopt.

(ii) Alternative explanations and reasons

The second problem of reduction concerns the inconsistency of arguing that a particular set of preferences will be selected, and that the reasons for action are unimportant in selection. I have argued above - following Davidson - that reasons are partial causes of actions, and thus must be taken into account in explanation. In particular the content and revision of preferences was stressed. Becker (1962) argued however that "the important theorems of modern economics" do not depend on the reasoning processes of the acting agents. Irrational as well as rational behaviour is consistent with the standard predictions of economic theory, in particular downward-sloping demand curves. Becker gives two interpretations to irrationality by example: impulsive and habitual behaviour. A rise in prices, whatever the choice-rule, reduces the budget set via income reductions, thus reducing purchases. The constraint makes the theory work, producing the prediction; not the preferences, beliefs or the decision rule. Preferences must however remain constant.

Kirzner (1962) commented that as well as constant tastes, it must also be assumed that agents respond to incentives if a displacement from equilibrium takes place. Decisions leading to 'mistakes' out of equilibrium need to be revised, and by price makers. Becker's result requires the assumption that all market participants are price-takers, and thus fails to meet Kirzner's objection.

Becker's attempt to provide a non-teleological explanation in this early article does not satisfy the criteria for explanation proposed in chapter two. Actions are causally accounted for: only in equilibrium will agents choose the point predicted by 'modern theorems'. At that point no other choice is possible. Out of equilibrium, intentionality affects outcome. Furthermore, the interpretation of a situation as an equilibrium one is not an empirical issue.

PART TWO: SELF-INTEREST & ALTRUISM

4.5 REINTERPRETING ALTRUISM

In this section I draw on the discussion of self-interest in chapter three, and particularly the exposition there of the sociobiological theory of reciprocated altruism. I shall here introduce a distinction, made by Sen, between sympathy and commitment, and examine the problems associated with non-compatible objectives. Consequentialism will be explicitly treated in this discussion, since this is a characteristic of an argument based on selection. I am interested in the possibility of altruism as a notion which goes beyond the sociobiological theory of 'reciprocated altruism' and hence violates the maximisation interpretation of own utility. I am not concerned with empirical evidence: the facts are not disputed, just their interpretation. The set of data are covered by a plurality of possible explanations. What we observe is a piece of behaviour, from which an interpretation is inferred. There is, as far as can be ascertained, no single altruistic gene; the genetic explanation is inferred and the altruistic gene 'revealed' by the behaviour, analogous to the way in which preferences are 'revealed' by choice in Samuelson's revealed preference theory [1].

First I consider the relationship between selection and self-interest, then I take care to distinguish between concepts, in putting forward the case against the account of altruism as self-interest. One way to understand the characteristics of utility - its relation to self interest,

1 . See Samuelson (1938) and also Wong (1978).

its consequentialism, and its role as a 'currency' to compare alternative sources of preference satisfaction in particular - is to see its relation to the more objectionable utilitarianism from which it historically developed from. There are well known objections to the latter, and I shall show that utility as used in ordinal preference theory does not escape these entirely. Hence an indirect method of appraising the utility component is to see what it has in common with utilitarianism, and then to consider the appropriate criticisms.

Against such an account is a wider conception of the motives for actions in general, and altruism in particular, which is in contradiction to the more strident claims of Becker, and of sociobiologists. Such a wider view, I shall show, accords with our intuition. As Arrow (1974,p.21) points out:

"We are always disturbed by a system which relies completely on selfish motives ... Most of our ethical teachings certainly rather stress that we do not even want this sense of alienation and anonymity in our interpersonal relations."

A separate point worthy of note, but which I shall mostly neglect, is that the pursuit of self-interest can be self-defeating. "Having a roving eye for a quick 'utile'", Sen (1983,p.9) points out "might well be disastrous for achieving happiness" [1].

In contrasting the two accounts of altruism - enlightened self-interest and impersonal regard for others - I am concerned to show how

1 . See footnote 1, p. 104 above.

they function as explanations of behaviour, and I am particularly concerned to show that a more pluralistic account of reasons for action, which include genuinely objective reasons for conduct, is plausible. It follows from my account that a differing view of the possibility of morality can be constructed to the sociobiologist account, and though I do not explicitly expand that direction of my claim here, I shall have something to say about it in my conclusion.

(i) Selection and self-interest: a confusion of roles

Two ambiguities arise with regard to the evolutionary explanation of self-interest. The first is the question of whether self-interest is a necessary condition for selection to operate appropriately, or whether it is itself the outcome of that selection. Many writers have suggested that self-interest has adaptive advantages, of which as we have seen, Becker is one [1]. Others have argued that 'moral sentiments' [2] are advantageous, though these mental states must translate into advantageous choices in terms of the consequences of action. On the other hand, many 'as-if' explanations in economics depend on the presence of arbitrage to enforced maximisation. Those engaged in arbitrage perceive profits as rents resulting from inefficient behaviour, they exploit the opportunities, and hence enforce maximisation. They must, necessarily, be themselves self-interested. Muth's defense of rational expectations is based upon this rationale, as will be seen in the next chapter.

1 . See especially Becker (1976).

2 . Smith might be included here. See also Ghilelin (1974) and footnote 1, p.83 above.

The second problem of ambiguity concerns whom 'self' refers to: the individual, the family, the firm, or the society. In chapter two, the important distinction in biology between the phenotype and the genotype was noted, and the possibility of conflicts of interest between them. In this section the problem of altruistic behaviour is discussed; cases where the immediate benefits accrue to other individuals. I shall distinguish as between two cases: where the expected interests of the individual may be advanced in the long-run by making short-run sacrifices of their own utility, and where the expected interests of the individual are permanently reduced by the act. If a plausible account of behaviour of the latter variety can be given, then the sociobiological explanation of altruism is not universal, and reductionist attempts at the justification of the assumption of self-interest are less appealing as all-encompassing accounts of behaviour. Of course it is open to economists to claim that their subject is confined to domains in which agents do pursue self-interest, either as an empirical observation or definitionally as explored in chapter three [1]. But if this were the case, then as I argued there, special reasons would have to be forthcoming for the limitations of domain.

It is important to note that the idea of selected self-interest is for the sociobiologist functional rather than teleological, terms which were discussed in chapter two. But if self-interest is the selector, if other agents engage in arbitrage from self-interest, then the outcome depends on the empirical assumption that at least some agents are self-interested initially in order to select in favour of self-interest. The argument

1 . The detailed discussion of Smith in chapter three is particularly relevant here, pp.80-84.

would not only be circular, but also dependent on precisely those variables which biological explanations try to eliminate: the motives, intentions and reasons of the individual agent. In biology it is the gene which is 'selfish', in economics the 'man'.

Self-interest and the profit motive are ideas particularly associated with capitalistic societies. If selection ensures that self-interest is a dominant motive, then it is likely that the moral code which regulates behaviour in the operation of the market is constant. There is no reason why it should vary, if competition enforces this type of behaviour. Hume, we saw above (p.74), asserted that constancy was an empirical fact. Yet historians disagree in studying earlier societies, describing changing moral codes, and in particular stress that the 'medieval mind' was not dominated to the same degree by the profit motive [1]. Religion played a more central role with its own distinctly altruistic moral code. The church was founded and continued to thrive on gifts by individuals. The church was built by patrons. Cross cultural comparisons have produced similar findings of the diversity of moral codes [2].

1 . See footnote 3, p.79 above.

2 . See for example Morishima (1983) on Japanese cultural differences and economic performance.

(ii) Concepts and properties of utility

(a) altruism and biology.

One of the problems with discussing altruism is that there are at least three literatures: the biological, philosophic and economic, which have been imperfectly integrated. In this section I will partially integrate these literatures in bringing criticisms to bear on the account of altruism as self-interest, focusing particularly on the contributions of Hamilton and Trivers, Becker and Sen. It will be shown that the ethical and biological discussions are often confused and muddled. Ours is not an ethical discussion. It is about feasibility and causality, though of course the implications are pregnant with ethical implications. Dawkins (1976, p.106) summarises the confusion thus:

"The muddle in human ethics over the level at which altruism is desirable - family, race, species, or all living things - is mirrored by the parallel muddle in human biology over the level at which altruism is to be expected according to the theory of evolution."

Altruism is, as was pointed out above, the chief problem of sociobiology. There are two informational restrictions in that account. The first is the limitation to consequentialist accounts of actions. Actions are defined as performed only with respect to consequences, and behaviour which might be thought to be non-consequentialist is re-interpreted in this framework. The second restriction concerns the motive for helping others. Altruism is typically defined as a sacrifice of the actor's welfare in order to increase that of one or more others.

In principle it might seem rather hard to square this type of

behaviour with maximising genetic fitness, and to specify selection mechanisms which might enhance its chances of becoming a common mode of behaviour within the relevant population. The sociobiologist effectively reinterprets the definition, in terms of the long-run/short-run distinction referred to in the historical chapter three. For altruism on this interpretation is the sacrifice of utility now to benefit another in at least the hope that it will increase one's own utility in the long-run by reciprocation. This is Trivers concept of 'reciprocated altruism' introduced above. Much of the subsequent sociobiological literature discusses the optimal strategy to enhance reciprocation. Indeed altruism on this interpretation is a form of strategic behaviour, directed at influencing others by altering their expectations. It is merely one type of such behaviour, of which perceived 'meanness' is its converse [1]. The theory of altruism is really, for Trivers, a theory of interested and not disinterested acts, and cannot except the existence of the possibility of acts of the second type.

Besides the tradition of sociobiology, the idea of self-interest has been intimately associated with the philosophical and psychological theory of utilitarianism. The economists' concept of utility derived from this historical source, and it is important to see the distinctions between these concepts, and hence between modern economists' discussions of preferences from those of the utilitarians. In particular, enforced maximisation is feasible only if utility has certain characteristics.

1. There are two approaches which are essentially similar in the reciprocated altruism literature: (1) Hamilton & Trivers; and (2) the prisoners' dilemma. On the latter see Axelrod (1981) and Axelrod & Trivers (1981) for the tit-for-tat solution. See also Maynard Smith (1982). On meanness, see Schelling (1978a).

(b) utility, utilitarianism and economics.

Maximisation is a meaningful operator provided that there exists a well-defined objective to be maximised. In economics that objective is typically assumed to be utility. The questions then arise firstly as to whether utility is a suitable (feasible and causative) objective for a model of human behaviour, and secondly whether it is defined. The former refers to whether there are objectionable characteristics associated with the content of utility. The latter relates to the problem of trading-off preferences (the sources of utility) against each other, whether some preferences can be compared directly with others.

Now it has been widely believed that the utility of which economists speak can be disassociated from the more objectionable features of utilitarianism from which it derived historically. It does not follow from the historical link that therefore the philosophical trapping of the utilitarians are necessary to the exposition of utility. Indeed Schumpeter (1954) for example forcefully argued for this separation. He points out (p.302,408):

"It was natural for Bentham and Mill to see themselves in the role of philosophical patrons of economics and to assume responsibility for an alliance between economics and utilitarianism that was acquiesced in by many later economists, such as Jevons and Edgeworth; but it was neither necessary nor useful. This alliance is the only reason why utilitarianism looms so large in the economist's picture of nineteenth-century thought, much larger than is justified either as a philosophy or as a factor of the zeitgeist."

In similar vein, Hicks (1939) in 'Value and Capital' claimed that utilitarianism was a matter of choice, and in that sense underlined the claim that the content of preferences was irrelevant to the utility maximising model, except in so far as they premitted an ordering. He wrote (1939,p.18):

"If one is a utilitarian in philosophy, one has a perfect right to be a utilitarian in one's economics. But if one is not (and few people are utilitarians nowadays), one also has the right to an economics free of utilitarian assumptions."

The central question then is whether the concept of utility employed in the utility maximising model is really "free of utilitarian assumptions", and the way to provide an answer is to see what properties they do or do not have in common. There are at least three common factors. Each is introduced here in order to bring out the basis of the relationships, which will be dealt with in seperate sections below, and their relation to the sociobiological case of altruism, maximising self-interest regarding long run utility discussed. They are trading-off, consequentialism and self-interest. The uncommon factors between the two, which yield important distinctions, include measurability and interpersonal comparisons.

The first common denominator is required for the valuation of maximising ends. For if the ends cannot be so reduced, problems are then of the form: maximise $[x_1, x_2, \dots, x_n]$ different goals or objectives; and as such it is not a well-defined problem since the trade-offs are not specified, and hence a particular course of action cannot be recommended as

'best'. Maximisation without a well-defined objective is meaningless. Utility provided that role in the economists' model, in that although utility may be derived from different sources, it can be added or summed together to provide a single total. (This idea of summing a vector of utility is explained further in section (iii) p.195f). Note here however that one way of denying the usefulness of utility is to deny the possibility of trade-offs [1] between conflicting objectives. The problem arises in both utility and in utilitarianism.

The second common characteristic is the domain of self-interest, contre Schumpeter who supports his proposition for a division between the two precisely on the issue of self-interest. He argues that utilitarianism requires hedonism [2], whilst utility does not (1954,p.408):

"Actually it is not difficult to show that the utility theory of value is entirely independent of any hedonistic postulates or philosophies. For it does not state or imply anything about the nature of the wants or desires from which it starts".

Schumpeter is asserting that hedonism is a property of utilitarianism, and hence a limitation or restriction on permissible wants and desires, whereas utility is more general and permissive. One is a restricted form of the other. These claims are not at all clear, in that the case for the

1. A more limited position is to deny the possibility of some trade-offs, and therefore to deny the use of a common denominator or currency between some consequences of some actions. On the vector notion, this is equivalent to partitioning the vector.

2. Hedonistic utilitarianism is a particularly restricted form which, contrary to Schumpeter, was not whole-heartedly supported by either Mill or Edgeworth. For a general discussion, see Sidgwick (1874) on Edgeworth, and Collard (1975).

happiness that utilitarians consider being more restrictive is not supported by any coherent arguments [1]. The utilitarian ethic - the greatest happiness to the greatest number - is ambiguous. It says nothing about the origin of happiness, about the trade-off between happiness and numbers, nor to whom the happiness should accrue. Some utilitarians have added auxiliary hypotheses to meet these points; but they are not necessary.

The third common factor is consequentialism - valuing acts in terms of the consequentialist states of affairs they produce. In the next section self-interest and commitment are further explored.

Thus far some of the conceptual difficulties with altruism have been discussed, and I have shown how the sociobiological interpretation is really a rather dressed-up claim that behaviour is self-interested. However there are, it turns out, several contentious issues in interpreting what self-interest means in terms of utility maximisation, and I have thus far tried to illustrate some of the characteristics by examining similarities between utility and utilitarianism. These have included trading-off, consequentialism and the reference of 'self'. I now explore the major areas of criticism of utility and self-interest, on which the reductionist account of altruism depends.

1. Sen (1979b) has proposed, in concentrating on the relationship between goodness of states of affairs and their utility characteristics, a set of definitions in order to separate out the important distinctions between act and outcome utilitarianism, welfarism, sum-ranking and weak Paretianism.

(c) Self-Interest and welfarism

The hedonistic characterisation of utilitarianism, which Schumpeter discusses, comes closest to what Sen calls welfarism, the evaluation of the relative goodness of alternative states of affairs on the exclusive basis of the respective collections of individual utilities in these states (1979b,p.538). But welfarism does not strictly require narrow hedonism of the Schumpeterian variety. Rather it is the use of utility measures, and utility information, that is at issue. Indeed some, if not most, modern forms of utilitarianism clearly and somewhat obviously survive the rejection of hedonism. To be individually utility-regarding does not necessarily imply being strictly self-centred, only self-regarding. All that is required is that pleasure and pain (however broadly or narrowly defined according to the utility information constraints discussed below) may be attributed to particular agents. Sources of pleasure might include the pleasure and well-being of others. Altruism and sympathy may be accommodated; commitment may not. These will be treated more precisely below.

Thus, when Schumpeter and indeed Marshall [1] deplore the link between utilitarianism and utility, it is a particular version that they have in mind. Utilitarianism can survive that criticism by appealing to wider sources of pain and pleasure. This appeal to wider sources avoids one form of hedonism; however, as Hollis (1981, p.170n) has pointed out, egoism is not only concerned with the empirical claims of restrictive motives, but also with, as he puts it (p.170fn):

1 . Marshall (1920) book 1, p.77n.

"a paradigmatic rule of interpretation, requiring that all social action be identified, analysed and explained by citing the agent's own wants ... Rational action is still defined in terms of effective satisfaction of wants and sentiments".

To the extent that Hollis is right, he identifies what is hedonistic about utility information. Utilitarianism is hedonistic only to the extent that it is restricted to utility information in a welfarist fashion. That is what links the two together.

(d) Altruism: bi-party and generalised.

The relationship between altruism and self-interest involves a series of question. Why should individuals be self-interested? Does such a view have a foundation in reason, or is it an intuitive judgement? Could it be demonstrated empirically? These last two questions have already been answered negatively, for behaviouralists typically assume self-interest in order to explain behaviour.

In order to criticise the concept to utility from the direction of the concern of individuals for others, I consider first the case of altruism, and the argument that it is not ruled out under utility considerations, and then the deeper criticisms concerning commitment.

The case of altruism, where x is altruistic towards y either because y's interests directly enter into x's utility function, or because x expects y to reciprocate and uses his altruistic act to signal the desire to cooperate in trading utility and/or in order to inculcate a sense of

obligation in y, is typically presented as a bi-party argument [1]. There is, it will be seen, a great difference between such bi-party altruism and the case of generalised altruism. Directing one's actions at a recognisable, and recognising, other person is very different from directing one's actions towards society as a whole, and thus towards unrecognised, and unrecognising, agents.

The point is that examples of altruistic behaviour which are argued to be in the interests of the altruistically acting agent assume that the acting agent knows his own preferences and those of the recipient, and similarly for the recipient. While this is not even very plausible at the bi-party level, for reasons discussed above and in the next chapter, it is even less plausible at the societal level. The only possibility here is that society develops recognisable rules of thumb at the societal level for rewarding generalised altruism. Tax concessions for charities and the conferring of patronage may be examples in point. However it is difficult to imagine that such rules could be optimal in the sense required for enforced maximisation, since the informational demands on the state would be enormous.

(e) Split-level functions.

One possibility advanced in the literature is that utility functions may be sub-divided, depending on the domain of concern. Classically, as was seen in chapter three, in the work of Adam Smith onwards, this distinction has been between commercial market-orientated activities, and

1. The discussion above in ch.3, pp.103-5, of Becker's concept of 'love' and the Rotten Kid Theorem are in this spirit.

private, non-market ones [1]. The idea at its simplest is that one acts selfishly in the market place, but employs a quite different, altruistic attitude towards one's family and friends.

The difficulty with this sub-division are firstly and somewhat obviously in terms of the normative and positive reasons for the division, which refers back to our discussion of the domain of economics, and specifically concerns the equating of economics with the pursuit of self-interest, in chapter three. Secondly however, as Marshall in particular noted, a certain degree of 'commercial morality' improves efficiency. Trust and honesty in business may be profitable strategies if it establishes reputation and goodwill. Thirdly, as Matthews (1981, pp.299-303) argues closely, the one domain may corrupt the other. Either business morality may be corrupted by non-business morality, by reducing our ability to exploit monopoly rent, or vice versa, in the sense that personal relationships become soured by the pursuit of self-interest.

An ingenuous development of this idea of a split-level function is to be found in Margolis (1982), in which the author attempts to overcome the bi-party objections raised above. His person acts 'as-if' is made up of two parts: self-interested and the group-interested. The problem is to devise a social welfare function to solve for the two components simultaneously. The equilibrium condition is to maximise a joint function weighted by the marginal utilities in group or self-interest. The justification that Margolis provides for his explicit 'as-if' argument is interestingly a Darwinian one, based on group survival. Specific mechanisms for encouraging the pursuit of group interest may be used to counter the appeals to the selfish gene to eliminate any non-group

1. See ch.3, p.82 above. J.S.Mill had such a split level function in mind when he considered the ideal voter in his conception of representative democracy who would, in this political act, disregard his own self-interest.

optimality (pp.31-33). The problems however with this position are numerous. They include the three listed above, and in addition the problem associated with functional explanation discussed in chapter two, and the method of constructing the aggregation of the two parts in situations of conflicts.

(f) Sympathy and commitment.

The reasons which people give as to why and how the interests of others effect their choices are numerous and diverse. There are a variety of different types of altruistic acts when classified by the reasons for those acts, the sources of our concern for the welfare of others. People act in others' interests directly for present and future gain, accidentally in pursuit of our own gain, and purposefully in the interests of others without regard to our own advantage. Sometimes people claim to act from a sense of duty rather than from preference. The pursuit of narrow desires need not accord with the dictates of reason, and provided reason is not, as Hume would have it, the slave of the passions, the possibility exists that we might sacrifice our desires to that of reason [1]. Reason here refers to that which is not personalised with respect to our own position in society. The dictates of reason are impersonal and moral ideas as motivations for action are arguably reasons which are inherently disinterested. Morality is not directly about our own emotions^[2] and

1 . See Hume (1975,p.302f) discusses the 'passion' for benevolence.

2 . McGuin (1979) makes this point in reviewing the sociobiologist account of altruism. He argues that this "cannot account for the existence and power of genuinely moral ideals in human thought and action" (p.84). For an objectivist, impersonalistic account of moral reasons, see Nagel (1970) and (1980).

preferences, but derives from other sources of reason .

To act from sympathy for the plight of another normally involves some feeling of pain at their suffering. Thus sympathetic acts contribute directly to our own utility in that the associated pain is reduced [1]. However the idea of acting from commitment, as distinct from sympathy, involves the presetting now of one's future acts regardless of the states of the world which might prevail at future dates. Since future states of the world materially affect future levels of the satisfaction of self-interest, it follows that the return to commitment is wider than the broader notions of utility including self-interested motivation of altruism [2]. Indeed Nagel (1979,pp.130-31) makes precisely this point:

"Commitments should not be confused with self-interest, for self-interest aims at the integrated fulfillment over time of all one's interests and desires (or at least those desires one does not wish to eliminate). Special commitments may, in their pursuit, be inimical to self-interest thus defined. They need not have been undertaken for self-interested reasons, and their pursuit certainly need not be controlled by self-interest."

A possible reply to such a challenge to the assumption of the pursuit of self-interest, and thus indirectly to the self-interest interpretation

1 . This may well be what Smith had in mind in proposing his 'theory of moral sentiments' as was explained in chapter three above.

2 . However, some selective advantage might befall those who acted from a sense of commitment. See Maynard-Smith (1982,pp.161-66). A typical example might be the advantages of acts from commitment in repeated prisoners' dilemma games, leading to 'reputation' as a valuable intangible asset, though Maynard Smith does point out (p.166) that the commitments must be binding.

of altruism, would be to claim that such behaviour turns out, even if not intended, to promote long-run maximisation of ex post utility [1]. Such a reply relies on the possibility that outcomes can be evaluated independently of the reasons and motives which underlie them. In order to be convincing the mechanisms which bring about utility maximising solutions, when unintended, need to be specified. An appeal to competitive selection is most likely.

(g) Consequentialism.

The characteristic of acts from commitment is that they are performed from considerations other than a narrow appraisal of the consequences in utility terms. Consequentialism, a common factor between utilitarianism and utility, is loosely defined as the notion that the goodness of states of affairs is to be evaluated solely in terms of the consequences or outcomes of acts. A more precise idea can be gleaned by considering the restrictions implied by consequentialism, given by Williams (1973,p.90), is:

"The claim that there is a type of action which is right whatever the consequences can be put by saying that with respect to some type of action, assumed as being adequately specified, then whatever the situation may (otherwise) be, that will be the right thing to do, whatever other state of affairs might be accessible to one, however much better it might be than the state of affairs produced by one's doing this action."

1. Examples include voting, dying for one's country, and lifeboat manning.

Consequentialism need not be teleological [1.]; it can neglect the mental states in the actor. Reasons for action, such as commitment, may be deemed irrelevant to evaluation. Yet to the extent that such a motive would cause an act which was different from that called forth by for example, self-interest, the consequences are not necessarily equivalent. And since non-consequentialist acts involve, in the commitment case, binding oneself with respect to future acts whatever the alternatives available, I have already suggested a case against consequentialism. However there is a difficulty here. Above I was concerned to prise apart self-interest and commitment. Here I wish to show that not only does acting out of commitment violate self-interest and the self-interest account of altruism, but that the commitment is non-consequential to any agent, whether general or not. Again the deeper defence is raised by providing a consequentialist interpretation. Suppose, it may be objected, it turns out that a society of non-consequentialist altruists happen, in the outcome, to end up with a higher utility level than those without. In replying, two points can be made. The first is that the evolutionary argument works for individuals, and their genes, and only indirectly for groups, to the extent that helping the group directly improves individual genetic fitness. The second is that there is no way of knowing whether non-consequentialism really would lead to higher total aggregate utility, and we do know that there can be individual differences between the two motives detrimental to self-interest.

Further to these particular objections there is an associated regress involved in consequentialist reasoning, which Williams (1973,p.82) has pointed out:-----

1. Strictly it allows only one kind of reasoning.

"No one can hold that everything, of whatever category, that has value, has it in virtue of its consequences. If that were so, one would just go on forever, and there would be an obviously hopeless regress."

For this and the above reasons the consequentialist argument is unconvincing at the overall ex post level, and hence can be removed as one of the crutches of the sociobiologists' altruism.

In rejecting consequentialism, it should also be noted that it requires that the trade-offs mentioned above must be possible [1]. A method of comparing consequences is required if to choose the right self-interest maximising action. To deny comparability in at least some cases implies a pluralistic theory of the sources of value. These alternative sources of value may not be consistent if comparability is not strictly defined. I thus turn next to a more detailed discussion of comparability.

(iii) Utility from different sources, comparability and trade-offs.

One of the principle characteristics of utility which we have noted is that it represents a single currency into which different goals can be exchanged into. Thus when economists ascribe utility functions to agents, the principle of marginal utility involved itself includes the idea of comparativeness or trading-off. Utility acts as a currency within which to trade-off, and it may be supplemented by weights from outside if exchange rates are required between different sources of utility. And it is not

1 . Williams (1973,p.88).

just that some quantity x from a particular source can be traded against another quantity y from the same or different source, but rather that x can be traded against everything else [1]. The idea is not necessarily to deny the feasibility of trade-offs (though that is a sustainable argument) but to claim that reasons may exist, moral or otherwise, for rejecting certain trade-offs. And in as far as reasons partially cause actions along the lines discussed in chapter two, these moral reasons for denying trade-offs will act to prevent the possibility of maximising solutions based on self-interest. Different sources of information should therefore be considered, and possible reasons for acting based on what sources might be chosen.

Let us start with this idea of different sources of utility information, and consider the concept of a vector of utility, with each component representing a different source. Economists employing the maximisation of utility model have claimed, as noted at the beginning of this chapter, that utility is merely an ordered collection of preferences. It is a ranked list which is independent of any inquiry into their source or the method of ranking. Conflicts of preference are assumed to be solved, and the preference ordering is the result of that solution. The ordering is exogenous to explanation as we explained above.

If utility is to be the currency within which the trade-offs are conducted, we need first to give it some definitional content. If utility is supposed to measure pleasure and pain, then we need to decide whether it

1 . Utility may be rejected as a concept even if trade-offs occur; since trade-offs may be permitted within domains but not between domains. The issue then becomes: is it the case that in economic situations utility trading is permissible? See footnote 1, p.185 above.

is a level or a rate; whether the amount of pleasure or the intensity of that pleasure. In so far as changes in, rather than actual states of affairs, affect individuals, then it is the intensity that matters. But the two need not be assumed linearly monotonic; the utility reward as intensity increases may display varying patterns. Further the duration of intensity, as mapped by Wundt curves, may also vary [1].

Secondly, let us consider types of utility. If it is permitted, as seems reasonable, that utility may derive from different sources, that preferences may be of different kinds, ought we not also to allow that its constituency may be distinguished into types according to those sources? These sources or preference-types may be broad - wants and needs - or narrow - specific types of wants and needs. Suppose, following Sen (1980-81), that this set of utilities by source is called a vector. Then:

"It is open to argument as to whether the intensity of pleasure from one type of pleasure can be compared with that from another. If such comparisons can be made, then there is - as it were - a natural 'metric' defined on the 'space' of these different pleasures by which they can be scaled against one another. And if the metric satisfies certain well-known mathematical properties, then these can also be aggregated to arrive at a figure of 'total' pleasure. This is indeed the standard characterisation of total utility under the pleasure interpretation. Even with a dual system in which the primary description of utility is in the form of a vector, the intensity-aggregate remains one obvious secondary view of utility -

1. See Scitovsky (1976) for an introduction to the psychological literature on this. He describes Wundt curves on pp.34-5.

adding the different pleasures up in terms of intensity, if such intensity comparisons can be made."

An immediate difficulty arises with this dual-system view of utility - where at one level we have a vector by utility sources and at the other we have an aggregation of the vector to form a single total. This question is given in the two 'if' phrases in the quotation:

- (i) 'if the metric satisfies certain well-known properties'; and
- (ii) 'if such intensity comparisons can be made'.

The argument here is that these two 'ifs' are only met where the trade-offs between the two types are well-defined. It is crucial to my view of utility, and to its rejection as forming the non-rational (or a-rational) objective of human behaviour that it can be viewed as a currency into which components can be translated by trade-off rules. These trade-off rules could be of different types, and need not be of utility information alone. In order to arrive at a scalar, a vector may be multiplied by a series of weights which may represent anything from distribution to intensity. The ranking of the preference ordering can emerge either by saying that, for example, $u_a > u_b$ because of some criteria of importance (eg. distribution) which states that $a R b$, or that the intensity of utility under a is greater than under b . It is thus to be admitted that the utility notion typically employed by economists does permit some non-utility information, and thus remains in an important sense wider than the considerations permissible under utilitarianism. However, one constraint (utility information) is replaced by another - comparability. The two may converge, if it is then argued that, since

utility is to be allowed different sources, the only constraint on what is to be called utility against what is ruled out is the criterion of comparability.

Whatever be the content of these trade-off rules, without them the maximising utility model may well - indeed almost certainly will be - meaningless, since the components of the vector to be maximised are likely to conflict. An objective function which contains conflicting elements cannot be maximised unless a trade-off function is specified. If it is then the problem is not well-defined. In the utility model, constraint specification of some sources of utility over others in the objective function could be achieved, but only if it were the case that a rationale existed [1]. The Nozick approach [2] to rights as constraints is one possible method. Alternatively, positive satisfactions from certain conventionally described utility sources may simply be denied when they conflict within the utility vector, or weights may be used (as described above) which derive from outside the utility framework, and maximisation can be operated by a form of stages consigning the result of the previous maximisation to the constraint at the next stage. The idea of trade-offs can be further extended. They must, as noted above, be well-defined so that maximisation from different sources can be carried out.

Cardinality may have to be assigned, implying a movement away from the concept of a ranking or ordered list within a vector. The reason here is similar in nature to the reason for cardinality in the SEU theory discussed

1. Note that in the preference theory without utility, the same problems apply.

2. Nozick (1974). See also Sen (1982a).

below in chapter five. In order to meet the comparability notion discussed above for utility, it must be possible to carry out multiplicative and/or adding up procedures. For example, one procedure might be to assign weights to each component of the vector. That component must then be multiplied by the specific weight before these components are then added up. Clearly more information is required than the ordinal $\succ$ (R) notation yields. But, it should be noted, once this transition from utility away from ordinal to cardinal information is made, the distinction between utility and utilitarianism is further weakened, in that if both require full comparability, the idea of utility as a preference ordering only breaks down. Preferences are fully comparable and desire-based. The constraints approach or the weights approach require the introduction of non-utility information, and therefore force a break with utilitarianism [1].

This brings us to the two discussions which can be brought to bear on the issues involved - Mill's (1863) discussion of higher and lower pleasures and Sen's (1979)(1982) discussion of utility and non-utility information. I shall outline each and show how they are related.

Many writers have pointed to the confusion which comes of introducing quality into quantity-based comparisons of utility. Mill realised that many would want to introduce such a distinction, and allow preference to be expressed between what he called 'higher' and 'lower' pleasures. This might be achieved by either denying that pleasure deriving from the latter

1 . Note that these two methods (weights and constraints) are quite different in that one introduces more information, while the other (constraints) restricts information.

source was really pleasure (that the individual was acting under some kind of self-deception - although he could not, for Mill, be acting from a desire expressed against a good reason, since his utilitarianism is forced to accept Hume's [1] dominance of passion over reason) or by some weighting system. The former requires some objective or agent-independent decision as to what shall and what shall not count as utility. The latter, likewise, requires some outside element. In other words, either everything which gives one pleasure subjectively is to be traded or aggregated into utility currency by virtue of what it yields in pleasure-intensity, or the utility measure is not self-contained. Since the pure form is unappealing (and this is what Mill and Sen both argue), the plural form of vector components is chosen. But it is no longer a single pure utility vector with direct action or decision consequences.

It is either an additive relation or a multiplicative one, depending on the preferred method of combination. In the additive case, for example, the plural vector components might be $\underline{u}$ and $t(\underline{u})$ where $t(\underline{u})$ represents some transformation function if non-utility information is included. Without $t(\underline{u})$, in this case at least one quality - or weights - index, the aggregate vector would be incomplete. The combination of $\underline{u}$ and $t(\underline{u})$ is a much richer motivational approach, including much information which is non-utility in character; yet retaining the comparativeness. To argue for a vector view of utility is to argue against a single-component objective of human behaviour. If an explanatory theory is what is required, then the question of weights cannot be left open. Of course, it may well be the case that certain non-consequentialist considerations imply that certain trade-offs

1 . See discussion above, p.57-8.

cannot be executed. Comparability may rely on consequentialist considerations, but equally it may not. To the extent that it does not, then we have a distinction between what is required to be true of utility in the preference-ordering problem and what is to be true for consequentialism.

This brings the various strands of the argument together, since there is now a serious difficulty with the sum-total - the second level consideration in the quotation from Sen's article. For each individual to have a well-defined maximisation problem, this second level aggregation must be solvable for that individual. The translation of the components of the vector into the utility aggregate must be feasible. But if non-utility information is included, which it must be if the sources of utility are to be weighted, then how can this utility be fully seen as just a utility-aggregate? Trading-off of utility may be allocated within the domain of the elements of the vector, but not between domains. The aggregate is a well-being one, which does not even need to be consequential, provided some other notion of comparativeness is admitted. If it cannot be constructed, or if there exists no maximising way of constructing it, economic man is left a little like Buridan's Ass - facing in several directions without being able to choose which to follow. He may be forced to behave non-comparatively, or even apparently 'inconsistently'. Whichever he does, the market cannot select out a maximum, since it is not defined.

4.6 CONCLUSION: THE REJECTING OF THE SELF-INTEREST & ORDERED PREFERENCES PARADIGM

In this chapter I began by stating the ordinal theory of consumer behaviour, and considered a series of objections which might be raised against it. I argued that preferences are typically not necessarily exogenous, stable or self-interested. On the basis of this, it was suggested that a theory of preference formation is required.

The response to my line of argument from defenders of the traditional theory is twofold. The first is to reinterpret the cases of apparent violation of the traditional theory as cases of utility maximisation from stable preference orderings. It was noted that this typically involved redefining the objectives of choice to include considerations of characteristics, human capital and time in the utility function. Cases of apparently altruistic behaviour are redefined as strategic or 'reciprocal' behaviour which is ultimately self-interested. The second is to admit of the endogeneity of preferences, and provide a theory of preference formation which would guarantee stability and hence transitivity over time. The theory of enforced preferences is that provided by sociobiologists, and I considered both the validity of this theory as an explanation and as a justification for preference stability.

Central to the sociobiological explanation is self-interest as the motive for behaviour considered quite generally. I rejected the account of altruism as enlarged self-interest, claiming that one of the reasons for action (and therefore a cause of action) was commitment, which I argued could not be represented in terms of consequentialist calculations of the self-interested individual. Furthermore, I went on to argue that the

extent to which individuals could order and trade-off preferences and the consequences of their action was limited. Here I discussed the problems implicit in considering utility as a vector, divided between sources, of split-level utility functions, and of trading-off between vector components. Since a unique and ordered ranking is a necessary condition for maximisation to be defined, these arguments tell against the possibility of utility maximisation. These results therefore against enforced maximisation. They show that the consequential actions which derive from calculations of utility are not well-defined, and that action may be directed towards others which does not include any such self-interested calculation.

In putting forward these conclusions, it should be stressed that I am not necessarily denying that all or any behaviour could be reinterpreted as if it were self-interested maximising behaviour. The neoclassical paradigm is consistent, and I have shown how it deals with the hard cases of apparent endogenous preferences like advertising and addiction. But because behaviour can be reinterpreted as maximising behaviour, it does not follow that that reinterpretation is a good explanation. That requires an account of the reasons for action, and my alternative paradigm includes non-consequentialist and genuinely altruistic behaviour which cannot be reincorporated in the traditional framework. Unfortunately, in the nature of these classifications, there is no empirical evidence which decides between the two paradigms, there being no dispute about action, only the causal processes which produce it. On the basis of the feasibility criterion and intuitive evidence one can however argue that the endogenous, pluralistic account is a better explanation than that provided by utility maximisation.

CHAPTER FIVE: ENFORCED BELIEFS

5.1 INTRODUCTION

Competition and selection occurs amongst individuals who differ as to their preferences and beliefs. Beliefs differ because of differential information and different interpretations of the same information. The presence of uncertainty is typically necessary for there to be a competition, and the theory of enforced maximisation recognises this. It has a theory of the optimal incorporation of imperfect information, and the formation of beliefs from it.

The second component of an economic explanation isolated in chapter two is a theory of beliefs, their formation and revision. Just as some preferences may be more conducive to survival than others, so too may some beliefs. For example, the belief that certain toadstools are poisonous may indeed be critical. Beliefs are partial causes of actions; they are, I argued in chapter two, reasons for actions. Actions themselves are directly affected by the environment of selection. The environment within which selection takes place is mainly constructed of other individuals. Other individuals have beliefs upon which they base their own choices. The characterisation of those beliefs and the method of search and revision are therefore an integral part of the process of selection. Beliefs are, indirectly, via actions, selected for and against with respect to other beliefs. There is a competition of beliefs behind the competition amongst actions. Some beliefs are more successful than others.

The idea of competition amongst beliefs presupposes a description of uncertainty and involves the issue of whether a probabilistic description is appropriate for economic choice. There are many types of beliefs, just as there are many types of preferences. These beliefs are formed under conditions of uncertainty which vary greatly. That there could be one description of that uncertainty, and the method of belief-formation and revision from it to cover all cases, is intuitively highly implausible.

Of the two issues which arise, the first is the fundamental of whether or not all behaviour under uncertainty can be described and explained probabilistically. It is fundamental because in the absence of a probabilistic description characterising the acting agent's mental state (and not whether an external observer can use this description) maximisation is undefined. If there is no clear maximising act amongst the choice set, then it cannot be enforced by selection. The second is whether risk aversion and survival are linked, whether survival depends on the trade-off between mean and variance of a probability distribution. It will here be shown that even, under probabilistic descriptions, efficient outcomes are not always defined. It is not always the case that more information is better than less, or that there exist appropriate incentives for convergence on the 'correct' probability distribution.

In this chapter I shall be predominantly be concerned with one particular theory of behaviour under uncertainty. It is rational expectations. The reason for focusing on this theory is that it claims that these expectations, and only these, are profit maximising ones, and that arbitrage will lead to convergence upon them. Arbitrage acts to select them, regardless of the individuals' intentions; selection makes

rational expectations enforced maximising expectations and arbitrage leads to convergence on the true or correct structural model. The rational expectations hypothesis is defended on explicit 'as-if' indirect grounds. These expectations are held to be profit-maximising (not necessarily utility maximising) in the sense that not forming rational expectations would lead to elimination by competitive selection. They are thus maximising expectations in two senses: they are consistent, as are all subjective expected utility beliefs, and they are maximal in the sense that they represent the optimal sub-set of beliefs amongst the set of all possible consistent belief sets. The rational expectations hypothesis is essentially a supplementary theory to the subjective expected utility hypothesis. It tells us where the (consistent) beliefs come from. If evolutionary selection enforces maximisation of expected utility, it must enforce rational expectations as the best method of forming the beliefs which yield want-satisfaction.

Rational expectations are then maximising expectations. From the point of view of this thesis, that is a central claim which I shall reject; I shall deny that such a set of expectations could exist, and that even if they did that they would necessarily be converged on. Of further interest here is that the argument is set up in an analogous fashion to Friedman's defense of profit maximisation for firms, outlined in chapter two, and discussed at length in chapter six.

In this chapter I suggest reasons why the rational expectations hypothesis should be rejected, on the basis of the criteria I advanced in chapter two. Alternative approaches to the description of behaviour under uncertainty are first reviewed, and associated methodological difficulties

considered. Next the informational claims of rational expectations are explored. Two of these will then be criticised: the structural claims and the probability approach of representing uncertainty. The former refers to the environment against which beliefs are selected. Typically in the literature this is assumed to be composed of utility and profit maximising agents. Thus an individual who deviates from rational expectations faces instantaneous penalties from arbitrage. However this is merely proof by assumption, and I shall question these structural assumptions below. The latter has wider implications but is crucial to the selection arguments; the absence of a clearly defined optimal choice under uncertainty undermines claims concerning competitive efficiency and enforced maximisation. I argue here that there is no necessary unique true structure upon which expectations might converge, nor is all uncertainty necessarily captured under probabilistic representations.

Throughout the chapter reference will be made to one of the alternative approaches to modelling behaviour under uncertainty - the satisficing or bounded rationality approach - to contrast against the traditional subjective expected utility paradigm. As with preferences, where reinterpretation within the traditional framework of apparently conflicting cases was possible, similarly under uncertainty it is always possible to reinterpret cases of apparent non-probabilistic uncertainty behaviour as-if the acting individuals had formed probabilities. That possibility is not however decisive, for the fact of its possibility does not imply that that is what actually happened, that that was a good explanation. To decide between the two paradigms, I shall again appeal to methodological criteria in chapter two, of which the most important here is feasibility. Further, to the extent that selection operates on beliefs, it

selects more satisfactory beliefs rather than less satisfactory beliefs with a regard for longer run considerations between periods, given that background conditions (of which beliefs are a part) vary over time. Such selection cannot, I shall argue, be interpreted as enforced maximisation, via rational expectations, on beliefs.

5.2. HISTORICAL BACKGROUND

There are five major lines of development in the theory of behaviour under uncertainty in the post-war literature [1]. Two of these had their origins side-by-side at Carnegie-Mellon University, the third and fourth concerned philosophers and economists, and the fifth lay outside economics. These were:

(i) the bounded rationality, satisficing theories of Herbert Simon (1955), and their subsequent development in the theory of the firm by Cyert and March (1963);

(ii) rational expectations, as pioneered by Muth (1961), while working with Simon, and subsequently developed in macroeconomics by Lucas (1980), Sargent & Wallace (1975), Rapping (with Lucas, in Lucas (1980)) and others;

(iii) axiomatic developments of the expected utility maximisation principle by von Neumann & Morgenstern (1947) for objective probabilities, and subjectively by Savage (1954), Jeffrey (1965) and others, and the related exploration of paradoxes, such as those of Allais (1953) and St. Petersburg. In this research programme, the response to axiom violation is to see what happens when these are weakened or dropped altogether. These include (a) Chew & MacCrimmon (1979a, 1979b) proposal of an alternative generalised expected utility model in which the substitution axiom is considerably weakened; (b) Machina's (1982) demonstration that the

1. Our classifications, of course, draw on a much older tradition and debate - of Marshall, Keynes, Ramsey, and Knight in economics, and probability theory in general in philosophy.

independence axiom may be dropped; (b) Loomes & Sugden's (1981) proposal to drop the transitivity axiom; and Fishburn's (1981) development of an alternative preference representation utilising neither transitivity nor independence axioms;

(iv) radical subjectivist non-probability approaches associated with one branch of Austrian thought, focusing on Shackle's (1939 & 1949) development of Hayek's thought, and a particular interpretation of Keynes' Probability and General Theory (so-called chapter 12 Keynesians);

(v) the psychological work presented by Kahneman, Tversky, Lichtenstein and Slovic (collected together in particular in Kahneman, Slovic & Tversky (1982)), and developed into heuristics and prospect theory by these and other writers.

Whether or not maximising beliefs are enforced by competitive selection depends on the relative validity of these approaches. The central issue that divides the two quite radically different paradigms of behaviour under uncertainty of satisficing and rational expectations approaches turns on the degree of rationality assumed. For Simon, it was the limited capacity of human problem solving which motivates his attempt to model less than perfect decision-making. As he put it (1955,p.99):

"The task is to replace the global rationality of economic man with a kind of rational behaviour that is compatible with the access to information and computational capacities that are actually possessed by organisms, including man, in the kinds of environments in which such organisms exist."

For Muth, the problem with existing decision theories of behaviour under

uncertainty was precisely the opposite - not enough rationality was assumed. As he put it (1961,p.3):

"It is sometimes argued that the assumption of rationality in economics leads to theories inconsistent with, or inadequate to explain, observed phenomena, especially changes over time (eg Simon 1959). Our hypothesis is based on exactly the opposite point of view: that dynamic economic models do not assume enough rationality."

The implication is that for Muth a unique single principle is required, whereas for Simon plural non-unique heuristics are needed. The psychologists concentrated not on a priori assumptions , but rather on extensive testing of actual behaviour under uncertainty, and only subsequently on providing theoretical principles.

The validity of the rational expectations approach is typically appraised by contrasting its predictions with those of adaptive and other expectational mechanisms. I will not take that route for reasons associated with the discussion of empirical evidence in chapter two above, nor will I be directly concerned with particular macro economic models and related neutrality results. Rather the wider issues relating to the broad approaches will be explored. It will be argued here that the combination of satisficing and psychological heuristics provides a better explanatory framework, by meeting the feasibility and causality criteria. It will not however be unique or singular. The choice between the two alternative approaches of Simon and Muth is not strictly an empirical one, though the empirical evidence presented by psychologists will be discussed below. The reason for this is that the evidence can be interpreted in both frameworks as confirmatory. Contrary to some received opinion, the evidence of the

psychologists does not, of itself, decide between the two paradigms of explanation. Correspondence rules and interpretation are both required and are untestable directly. Thus we will be thrown back to criteria of feasibility and causality.

5.3 INTERPRETING RATIONAL EXPECTATIONS

Rational expectations represents a theory of either how agents do form expectations under uncertainty, or how they should do so. It is either descriptive or normative. In this chapter I consider it as a descriptive theory, as Muth [1] originally intended it. However, in demonstrating that agents do not always have sufficient information from which to form probabilities on which rational expectations may be constructed, it is established that, to the extent that a normative model should also meet the requirements of feasibility, the normative interpretation is of dubious validity.

There are a variety of methods of criticising theories that were outlined in chapter two. But first we are confronted with the problem that it is extremely hard to decide what precisely the rational expectations hypothesis means. In particular, the literature on the so-called 'rational expectations revolution' is intimately associated with new classical macroeconomics [2]. And in questioning the predictions of the rational expectations hypothesis, simultaneously the particular structure is also questioned, the actual stochastic behaviour of the system, upon which the expectations are formed. This is the line of approach which is to be found in surveys such as Kantor (1979), Begg (1982) and Sheffrin (1983). It is an interesting prior question as to whether a particular type of structure is

1. Muth (1961) p.316: "At the risk of confusing this purely descriptive hypothesis with a pronouncement as to what firms ought to do, we call such expectations 'rational'".

2. Cesarano (1983) suggests the similarity of concerns and predictions between rational expectations/new classical models now and those of Cantillon and Hume.

required in the first place, and if so what characteristics it has since the structure is the environment of selection. That is what the next two sections of the chapter concentrate on.

In adopting the approach of questioning the foundations of the theory, I shall concentrate on feasibility. In particular I focus on what would have to be the case for this model of expectations formation to be plausible; what human beings would have to be mentally capable of. In attempting to provide an answer to this question, I consider whether there could exist a unique true structure of the world, and whether it could ever be known with any degree of certainty whether it would be characterised by enforced maximisation. The latter problem relates to the inductive method, that people can be increasingly certain of contingent events recurring as the number of occasions rises. It is not claimed here that all rational expectations theorists adhere to this view about the possibility of a true structural model; rather what it is that would be false, if they did so. For they would have to if maximisation were enforced. The best outcome is uniquely best. One characteristic of the structural model which is certainly common to all rational expectations theorists is that it is constructed in maximisation terms. Thus the chapter has two parts: the structural claims and the possibility of maximisation under uncertainty. In section 5.6 below, the existence of reasonable grounds for basing that structure on the assumption of maximisation is questioned, whether individuals are capable of maximising decisions under uncertainty.

The as-if justification of rational expectations, that agents act as if they had sufficient information and were capable of solving a string of equations for the appropriate model, since profitable arbitrage is possible

if they do not, is inadequate I argued in chapter two unless an explanation is given as to why agents act 'as-if'. Some causal mechanism, I claimed, must be provided to count as an explanation . It is insufficient to assume for example that agents act 'as-if' they knew the structure of the economy [1]. To be 'rational', I argued in chapter two, means to act from reasons, and a necessary but not sufficient condition of being reasonable, is that the reasons be feasible. To the extent that rational expectations requires that there be a true and unique structural model of the economy, based on maximising principles, the approach is here rejected. Once the hypothesis is rejected on grounds of feasibility, any ad hoc defence along as-if lines is also rejected.

The second argument concerns maximisation directly. Two reasons are put forward as to why maximisation under uncertainty may not be feasible. These are: (i) because of at least some undefined probability distributions, and the problem of fundamental non-probabilistic uncertainty; and (ii) because of quite general infinite regresses associated with optimisation search procedures. Of these two objections, the first asks whether sufficient information could be available, and the second considers the consequences of search costs in gathering that information if it were available. The maximisation paradigm with respect to the selection of a certain kind of belief is, it is argued here, subject to a number of compelling objections.

A defender of the rational expectations hypotheses may raise against my approach the objection that I have deliberately constructed a 'straw

1. Muth (1961, p.317) explicitly uses this type of justification.

man', and that its demise leaves a more sophisticated version intact. Gale (1982,p.31) for example points out that:

"It is easy to make fun of the naivete of the REH. Critics have seized upon the implications that individuals are perfect forecasters and parading it around in triumph, as if the REH were thereby proved to be useless."

Gale points to 'as-if' justifications and the use of the REH as a benchmark. But he goes on to make the following point in relation to the Lucas-Sargent developments of the theory. He writes (p.35):

"All that has been required for the LSP (Lucas-Sargent Proposition) to hold is that individuals should do as well as the government at forecasting, precisely that they should use the same structural model, have the same estimates of coefficients and the same subjective probability distributions of the error term ... In particular it is not required that individuals have a complete model."

Nothing in what I shall say below makes the assumption of complete knowledge of the structure of the economy, by either the authorities or by individuals. I make only three major points: (i) that rational expectations assumes that a true unique structure exists (and thus that such a claim is meaningful at all); (ii) that it is based on maximising assumptions; and (iii) that rational expectations are claimed to be enforced (and hence justified as an assumption) by selection. I do not assume that agents have complete knowledge in my portrayal of rational expectations. Maximisation is crucial to rational expectations; anything said here in objection to that principle applies directly to rational

expectations, which is, after all, only the hypothesis that individuals maximise in the formation of their beliefs. Using information efficiently to the rational expectations theorist means maximising with respect to it.

Finally it should be remembered from chapter two that explanation derives from a relationship between a theory and the actual behaviour about which it is a necessary simplification, correspondence rules, feasibility and actual evidence. The evidence, while not decisive, needs to be explained within the paradigm. In this respect, the findings of the fifth of the approaches to uncertainty discussed in section 5.2 above is drawn on, the psychologists. This evidence poses severe difficulties for the REH, because it requires that more than one interpretation of probability needs to be appealed to, and employed simultaneously by agents. Consistency required to define probabilities, like consistency in preferences, is expensive.

5.4 INFORMATIONAL ASSUMPTIONS ASSOCIATED WITH RATIONAL EXPECTATIONS

Rational expectations is a restricted form of maximisation under incomplete information; it imposes constraints on the kind of incomplete information which is available, and on the way in which it is utilised. In this section a series of informational assumptions are listed which will be subsequently criticised. Not all rational expectations positions depend upon them, nor are they necessarily consistent. Rather they are a list which may be drawn upon in order to demonstrate what cannot be claimed.

Information from which to form rational expectations has to come from a structure, and it may be added, one which displays some sort of regularity in order that agents can learn. The first assumption is that there exists a true structural model of the economy. Individuals do not necessarily know the model at any point in time, but they could in principle discover it by employing the inductivist principle.

The second assumption I shall consider here is that it is feasible for agents to hold a true set of beliefs mapping the true structure of the economy with errors which are only random, and have an expected mean of zero.

Third, the true structural model is assumed to be based on maximising/optimising behaviour on the part of individual agents, with well-ordered preference functions obeying the usual axioms such as completeness and transitivity.

Fourth, there exists two forms of uncertainty: (a) model-uncertainty (variable uncertainty), roughly corresponding to belief uncertainty; and (b) coefficient-uncertainty.

Fifth, there is an error learning process for convergence upon the true structural model capable of in principle eliminating both forms of uncertainty listed above [(a) and (b)], based on optimising search behaviour.

Sixth, an arbitrage procedure exists whereby if agents do not learn from their mistakes (they deviate from behaviour which would result if they had formed rational expectations), then others will exploit the economic rent accruing, enforcing rational expectational methods. Learning to form rational expectations is then a profit maximising activity and competitive arbitrage enforces maximisation.

Seventh, individuals hold probability information (subjective or objective depending on the theory) for each of the possible structural characterisations of the economy, and for each coefficient. Individuals are assumed to have well-ordered preference functions, which when combined with their probability distributions, give them a subjective expected utility distribution, upon which they can act so as to maximise their expected utility.

Eighth, empirical evidence can discriminate between competing structural models and correctly evaluate coefficients. In particular, econometric techniques can discriminate between structures by the identification of temporal priority and causality (along the lines of Sims and Granger causality tests [1]), and, at least implicitly, verification is methodologically plausible (the induction principle).

1. See above, p.48.

Given these informational claims, or at least some subset of them (depending on which interpretation of rational expectations is adopted), two propositions have been put forward in the literature on rational expectations. These are:

(1) Expectations correspond to the predictions of the relevant economic theory, where 'relevant' may be taken to mean either 'true' (in the strongest form of rational expectations), or 'best approximation to the true' (in the weaker versions).

(2) Agents do not make systematic mistakes. Agents act rationally to eliminate potential economic rents associated with non-maximising behaviour.

These informational assumptions are examined under two headings. First in section 5.5 below I examine the structural claims in general relating to the existence and convergence upon the 'true' structural model, and then in section 5.6 the more specific claims relating to maximisation and probability information. In the latter discussion I draw extensively on the criticisms advanced by the other approaches to uncertainty, in particular satisficing and the work of the psychologists.

5.5 STRUCTURAL CLAIMS

The structural claims embedded in the various interpretations of rational expectations models differ considerably. Two approaches may however be distinguished. The first is to claim that there exists a true structure characterised at a deep level by constancy of tastes and technology. It is objective and discoverable, since it is constant, and we can learn about constancies. This is the approach adopted by Lucas [1], Stigler and Becker (1977) and by Sargent (1981). In chapter four the assumption of constancy of tastes was explicitly rejected. The other approach is to weaken the requirements such that either rational expectations is an analytical device or tool under which the consequences of an individual acting on his beliefs is investigated (which is vacuous without specifying what those beliefs are) or it is a device to investigate what happens when authorities have similar information sets to private sector agents [2].

Let us consider first what a structural model consists of quite generally. In the literature, models of the structure consist of a series of equations with dependent and independent variables, at least some of the latter being exogenous to the model. In a general equilibrium model with causal explanatory content, the exogenous variables are tastes and technology. The variables in the equations can be subdivided into those referring to the beliefs that agents hold about the world (for example expected inflation) and those referring to actual and past states of the

1 . The Lucas critique operates at a higher level in the structure, but not at the basic level of tastes and preferences.

2 . See the quotation from Gale (1982) above, p. 217.

world (for example actual or past rates of inflation). There would be, in a unique and stable structural model, which may or may not be directly observable, a dualism between the world and our beliefs about that world. The world has the immutable true features; our beliefs may more or less correctly mirror that structure to the extent which I shall question below.

If however this symmetrical dualism is an incorrect reflection of the economic structure, then there would be reason to question the uniqueness of our description of that structure. That is, if the structure of our world depended at least in part on our beliefs about our world, then a necessary condition for the establishment of the proposition that a 'true' structural model of the world existed would be that there exists a unique and true set of beliefs about the world.

The inclusion of beliefs in our descriptive and explanatory parameters of the structural model depends on two propositions. The first is that our interpretation of the world depends on our beliefs about it, in the sense that the concepts of theory are necessary priors to our observations of the world. It is through our beliefs and concepts that we understand the world. There can be, as was pointed out in chapter two, "no measurement without theory".

The second proposition is that individuals' actions are partially causally determined by the set of beliefs that they hold at the moment of decision (chapter two, section 2.3(vi)). Since both of these claims have been substantiated in chapter two above (though I shall say more about them below), beliefs are then endogenous (because causal) to the structure. These change over time; therefore the structure of the economy changes over

time. Therefore, there exists a true structural model at a point in time if there exists a unique and true set of beliefs about the world at a point in time.

The question now is whether there is a true structural model (uniquely and stably) determined for beliefs at a point in time. There are several methods of invalidating this, which all involve the triangular relationship between theory, beliefs and actions. They include conventions and search, concept relativism, and the way in which theories are constructed. Theoretical objections are concentrated on here, chosen with regard to the criteria in chapter two.

(i) Beliefs, conventions and search

Constructing one's beliefs and forming theories is itself a form of search. Given that other agents' beliefs partially determine their behaviour, there are three factors which should be taken into account in explaining market behaviour: the actual set of beliefs that prevail at a point in time, the underlying behaviour of the economy within which these beliefs operate, and possible expected future revision of those beliefs. The rational act is not always that act which seems on current information to be the correct one. A false belief may be more profitable than a correct one at least in the short run, and it may help if the false belief is shared by others. There are a number of examples where selection may operate in favour of the holder of a false belief. These include speculative bubbles [¹], political action and conviction, self-fulfilling

1. Blanchard (1976).

beliefs [1], and strategic belief revelation [2]. These cases may be divided into those where the holding of the false belief has some selective advantage, at least in the short run; cases where the apparently false belief has certain self-fulfilling properties; and cases where truth and falsity are not at issue at all, such as the adoption of conventions.

Beginning with the profitability of apparently irrational acts, it has been persuasively argued by Blanchard (1976) that joining in speculative bubbles can be profit-maximising when compared with not doing so on rational expectations grounds. The consequences of this result are very important. The existence of such a bubble, and participation in it by rational profit seeking agents alters the world from what it would have been in the absence of the bubble. It may have started as a random disturbance from trend, but participation by the rational agent introduces a bias away from the trend, such that the new equilibrium is different from what it would have been had the bubble not occurred.

The second example of profitable false beliefs concerns Keynes' famous example of the beauty competition [3]. Keynes pointed out that the best judge was not the one who revealed his own preferences, but the one who chose what the average person would think was the prettiest girl, even if that choice does not correspond to his own preference. To extend the argument, if the judge has different preferences, it might be in his interest (qua successful judge) to delegate his decision to someone else,

1. Schelling (1973a)

2. Vickers (1985).

3 . Keynes' interest in beauty competitions goes back to the 'Treatise on Probability', pp.27-29, where he uses a legal case to argue that probabilities are not always numerically ascribable.

with preferences other than his own, and closer to the average. Consider another example. In the capital market, a profit maximising agent with different beliefs about the long term performance of an economy, might make higher profits if he delegated his decisions to an agent with different market-shared beliefs. The delegation example can be given a further twist by considering the profitability of giving false signals about one's beliefs. It may be in the interests of the profit maximiser to 'reveal' false beliefs in order to elicit certain responses from his competitors. John Vickers (1985) has proposed a model in which strategic considerations might persuade an owner of a firm to appoint non-profit maximising managers in order to maximise profits [1].

To these sorts of examples can be added further cases which suggest that the acquisition of information (in contradiction to the rational expectations theorists claim) might reduce profits. The REH rests on the assumption that more information is always better than less, provided it isn't too expensive. However, in some activities to be better informed is to be less effective. Consider the politician trying to persuade the electorate of the merits of a simple policy. The more certain he or she is the more effective the person might be in persuading others. More information may lead to modification, inducing doubt, and therefore reducing success (qua politician in getting elected).

Hirschman (1967) has pointed out that individual self-deception, as in the above politician example, might have considerable social benefits when taken in aggregate. He proposed 'the principle of the hiding hand' to

1 . See chapter six, p .234 below. This is a case of strategic rather than naive maximisation.

cover such cases. For example in wartime, effort and fighting ability is an increasing function of the strength of the belief by the soldiers in victory. Either believing individually irrationally in the chances of success, or being given false information by propoganda and believing it, acts to increase one chances of success (qua member of a victorious army). Alternatively, religious beliefs may bring forth altruistic behaviour which may be in aggregate socially advantagous. In another context, Tawney has argued that 'the Protestant ethic', the belief in the ethical good of thrift, saving and individualistic self-help, aided the success of capitalism. Even if the ethic happened to be 'false', it nevertheless may have increased one's material position. Schumpeter (1934) pointed out the social benefits of innovative activity associated with the irrationality of investors, believing disproportionately in the likelihood of their own success [1].

The above are all possible cases of false profitable beliefs. It is of course not denied that some true beliefs may also be profitable. Rather I am merely trying to establish that some false beliefs may be advantageous, and thus to refute the relationship between true beliefs, maximisation, and convergence on the 'correct' rational expectations structure. A subset of false profitable beliefs discussed above may have the property of being self-fulfilling, of which the most prevalent might arguably be rational expectations. That is, if enough people hold them they change the structure of the world, and thus make the belief, initially false, become true. The way in which we can conceptually think of this is to start with a false belief, by assuming a structure within which it would

1 . See chapter three, p.120 above.

be false, and then see what happens as the number of people who hold it increases. Two examples are Keynesian and monetarist beliefs in macroeconomic models [1] and the cobweb. The latter example Muth (1961, pp.330-32) used to demonstrate the differences between rational and adaptive expectations. However, provided convergence is not instantaneous, and there are at least some individuals who hold non-rational expectations in the first place, convergence is not necessarily obviously the optimal strategy for each individual. As Arrow (1982) has pointed out, if some people are irrational, in the sense of non-maximising, it is by no means obvious that the best act is the maximising one [2].

There is a third category of beliefs which (while they themselves might be true or false) do not depend for their effectiveness on the criterion of truth. There may be a plurality of possible beliefs, and hence a plurality of possible structures. The framework within which beliefs have their effect may be called conventions [3]. Perhaps the most common convention is the use of language. The success of the user of a convention does not depend on the relative merits of one or another form in itself, but rather on where the person happens to be. French is neither better nor worse than German as a language, but it is more profitable to

1 . The example I have in mind is where people in different markets use different structural models, for example Keynesian beliefs pervading labour markets and monetarist ones in financial markets, and both have some associated self-fulfilling properties. Models which point in this direction are Peel & Metcalfe (1979) and the 'expectations trap' considered by Boltho (1983).

2 . Many other examples of self-fulfilling beliefs are given by Schelling (1978a, pp.118-24).

3 . See Lewis (1970) on conventions. Note also that this idea is close to that of classification outlined in chapter two above.

employ the German convention if one happens to live in Germany. Driving on the left or right hand side of the road is another such example, with possibly severe consequences for employing the wrong convention. In the economic domain, many rules of thumb which are used in decision making depend on others employing the same procedure. The essential advantage of a convention is consistency, where there is more than one possible way of doing the same thing.

(ii) Beliefs, concepts and measurement

The second line of attack on the relation between unique true structures and beliefs concerns concept-dependency. But before this problem is tackled directly, beliefs need to be related to theories to avoid any ambiguities that might otherwise arise. The tendency for information about the world to be separated in the expectational literature from our beliefs about it has already been noted. Structures have been demonstrated to include behaviour, and that behaviour depends in part on preferences and beliefs. But economists frequently separate beliefs from information, such that even if beliefs partially determine behaviour, information about behaviour however caused and about external constraints is independent of agents. It is in a sense neutral between agents and societies. Beliefs may be false, but information has some external value separate from the agents' beliefs. In such a world, observations, about which information is a summary or report, have independent existence [1]. They do not depend on theory. In more philosophical terms, this position

1 . There are two possibilities here: either observations are strictly theory-independent, or at the surface level they are not, but in some deeper sense with respect to a base level theory about what exists in the world they are. See Sen (1980) who puts forward the latter view.

is one of the neutrality of theory with respect to observation. Rather than observation being theory-dependent as the relativist would have it, the agent resembles mentally a blank piece of paper, bombarded with sense-data, which exist independently of the agent's own mental processes, and which can be uniquely understood. Now, apart from the considerable epistemological difficulties created by this approach (relating to the order that the world would appear to display, with the idea of reasoning, and the possibilities of knowledge [1]), it is also at remarkable odds with the ways in which economists typically argue. For much dispute in economics is about what constitutes the concepts which we would like to be able to measure, and how they are to be theoretically justified. When theory and fact come into conflict, it is often the facts that we question [2]. In chapter two the special features associated with empirical evidence in economics were discussed at length.

The reason why it is important to refute the empiricist view relates to the proposition above concerning empirical evidence. For the rational expectations theorist, it is vital that mistakes are discovered, readily understood, and behaviour immediately revised, if convergence is to be possible. However the imprecision of the distinction between fact and theory, and what Friedman calls the 'indeterminacy principle' [3] in the relation between the observer and his concepts and the observed, and between the process of measurement and the measured reduces that

1 . The literature in philosophy on this is of course vast. For an introduction, see Russell (1921) and Ayer (1956).

2 . Hicks (1983, pp.347-8) and p.40 above.

3 . Friedman (1953, p.5n.). On the inconsistency between advancing this principle and the others in Friedman's article, see Helm (1984b).

possibility. The really important relation is however between the structure and our theories about it.

(iii) Structure and theories

Thus far, I have argued that observations and information depend on prior theories. But if it is our beliefs which determine our actions (in conjunction with our preferences), what is the relation between our beliefs about the world and theories attempting to explain that world? It is one of the more remarkable achievements of the rational expectations literature to point out that agent's beliefs are equivalent to a (not the) theory of the structure of the world. The implication for our argument is that if there exists a true structural model at a point of time then there exists a unique and true set of theories about the world at that point in time. As Muth (1961,p.316) put this point in his famous quotation:

"Expectations, since they are informed predictions of future events, are essentially the same as the predictions of the relevant economic theory."[1]

This is because:

"(1) Information is scarce, and the economic system generally does not waste it. (2) The way expectations are formed depends specifically on the structure of the relevant system describing the economy."

Therefore all that is required to deny the claim about a true set of

1. The uncertainty being a reflection of theory is a view shared by Simon. He writes (1976,p.142): "Uncertainty ...exists not in the outside world, but in the eye and mind of the beholder". Of course , Muth and Simon draw opposite implications with respect to which theory is appropriate.

theories at a point in time is to put forward good reasons for supposing that there does not exist any 'true' economic theory [1].

This claim is really rather obvious: a complete description and explanation of a piece of behaviour involves too many infinite regresses to be plausible. In other words, in order to construct theories, we simplify and propose classifications. A simplification from a mass of detail to produce patterns and generalisations is necessarily strictly incomplete. It cannot therefore be strictly a 'true' mapping of it. As Lucas (1980,p.696) puts the point:

"Any model that is well enough articulated to give clear answers to questions we put to it will necessarily be artificial, abstract, patently 'unreal'."

Similar points have been made throughout the methodological literature, of which Friedman (1953) and Hicks (1976) are but examples. An agent therefore cannot have a 'true' theory in its literal sense; therefore an agent cannot have a 'true' and complete set of beliefs about the structure which depends on those beliefs.

It remains to relate the theory-ladenness of observations discussed in the previous section to the comments about the relationship between beliefs and theories. One of the motivations behind discussing the relationship between beliefs and theories was to demonstrate how observations were theory-laden, and in that theory-ladenness, dependent on

1. This latter claim does not apply to theorems, where what I mean by theorems is the mathematical and logical results which follow from their definitional premises, such as the proposition that $2+2=4$.

our beliefs. If then concepts such as money, cost and income are classifications imposed upon the world, then they are not independent of that world. Necessarily false theories order observations; false theories as the means for the production of beliefs partially determine our behaviour, and the variables by which our own and others behaviour are observed are themselves determined by theory. It is in this sense a relativistic world [1]. When a theory is tested, the consistency of sets of theories is checked. That in itself is, as was pointed out in chapter two, a very important procedure; but we are not in the process using information of a type sufficient to converge on a true structural model or theory. Observations may in themselves remain objective; but their interpretation and meaning to the individual doing the acting do not have the same status.

Recapping so far, I have put forward reasons for rejecting the first two of the informational assumptions listed in section 5.4 concerning the existence of beliefs conducive to the 'true' structural model. These are based on the selective value of false beliefs, and the possibility that some 'true' beliefs may turn out to be a liability to the holder, and that the relationship between theory, beliefs and observations provides no clear-cut way of identifying mistakes in order to converge on the true structural model. The latter arguments are closely associated with the methodological foundations laid down in chapter two. I now go on to consider a particular characteristic of that structure: maximising behaviour, and the necessary conditions for its feasibility. These are

1. See for a sample of the literature on relativism, Winch (1958) and more recently, Hollis & Lukes (1982).

knowledge of the costs and benefits of search, and probability information.

5.6 MAXIMISING BEHAVIOUR UNDER UNCERTAINTY

The claim that the true structural model is based on maximising behaviour by individual agents lies at the heart of rational expectations thinking and much else besides. Rational behaviour is maximising behaviour; what maximising agents do, conditional on the information set and consistent preferences, is what rational agents would do. Rational expectations extends that rationality to the formation of expectations. In this sense, Muth extended the amount of rationality assumed, while Simon's work went in the opposite direction. As Prescott (1977, p.39) puts it:

"The rational expectations paradigm may be considered in the same spirit as the maximising assumption, once the subject of much debate in economics but now considered to be fundamental. The rational expectations assumption augmented the maximising assumption by hypothesising that agents use their information sets efficiently when maximising."

Maddock and Carter (1982,p.41) complete their survey in a similar vein:

"The RE hypothesis, in itself, should not be provocative to economists. It merely brings expectations within the scope of individual maximising behaviour. Expectations used to be handled within economic models on an ad hoc basis. RE provides a way of incorporating expectations which is consistent with the orthodox economic theorizing."

The idea then is that rational agents use the maximising principle to form expectations with which to combine with their preferences in order to

maximise their subjective expected utility. Rational expectations are then, it is claimed, profit maximising expectations; not to form expectations in this way is to use information in an inefficient, and hence partially exploitable way.

It is important to note that rational expectations means more than that agents act on the basis of their beliefs, try to achieve the best they can in the circumstances they find themselves in, and react to their mistakes (when they recognise them) by trying to improve their performance, subject to cost constraints. If that were all that was claimed by the REH then there really can be little objection. In this case, satisficing behaviour and rational expectations are quite compatible. To distinguish the two hypotheses, further feasibility assumptions are required as to what agents are actually capable of. When writers such as Sargent and Wallace (1975) argue that one piece of evidence in favour of the rational expectations hypothesis is that "it accords with the economists' usual practice of assuming that people behave in their own best interests", they generally mean more than this weak sense of 'doing one's best'; they mean that they can and do maximise. Systematic errors can be both detected and eliminated. Rational expectations therefore has certain self-fulfilling associated properties.

The object of our concern is then this stronger sense. If the maximisation hypothesis were to be undermined as a descriptive and explanatory assumption about human instrumental rationality, then the rational expectations hypothesis would be rendered relatively harmless. This is what this section attempts to do, and in two specific ways. I suggest that, under at least some conditions of uncertainty, there may not

exist the right kind of information (by which I mean sufficient to form probabilities from) from which ex ante maximising choices can be made. The two reasons used to support this proposition are concerned with search and probability [1]. These arise out of two related premises required to support the third proposition in section 5.4 above - agents can and do hold probability information (subjective) for each possible structural parameter of the economy, and for each coefficient; and that optimisation search behaviour is defined.

The relevant question is therefore how much information an agent would have to have in order to form rational expectations. In order to refute these claims, I shall demonstrate that it is not feasible for individuals to fulfill them. That would be sufficient. Of course, even if it were feasible, it does not follow that it is therefore necessarily correct. To claim that it is not feasible is to take the Simon line; to claim that it is not followed is to take the course of the psychological literature, which will be discussed in the next section.

The first problem then is with the existence of probability information for agents where there is uncertainty.

(i) Probability information

There are two methods of approaching this problem: either the justification for the defenses of probability information can be questioned, or an alternative model can be presented. To achieve both

1. There may be a third concerned with the indeterminacy of certain types of games. On this see Helm (1983b, pp. 28-9).

would be ideal , but this thesis concerning only enforced maximisation requires only the first. There are a number of claims relating to probability information to be found in the literature. These include firstly that agents can and do form subjective or objective (depending on which of the theories of probability is being employed) probability distributions, which are, in the subjective sense, measures of the agent's mental state. In the objective case, these are measures of the propositions existing in the structure, and can be reflected in the agent's mental states.

A second claim is that these probability distributions are universal (completely ordered); given any 2 possible outcomes (x,y) , either x is more probable than y , or y is more probable than x , or they are equally likely.

A third claim is that these probability distributions form the basis of action-choices when combined with preferences; the relationship being a unique and complete mapping of one to the other, given preferences. Therefore given the probabilities and preferences, action-choices can be predicted; given action-choices and stable preferences, probabilities can be derived. (The latter is a necessary condition for the employment of gambling-probability-revealing experimentation.) No other non-probability information is relevant to choosing actions.

The rational expectations theorists add more restrictions; that probabilities are equivalent to (are derived from) the predictions of the appropriate theory, and from this that effectively subjective probabilities

are objective, if the appropriate theory is true [1].

Probability is a formal system open to a number of semantics: two of which most commonly used in economics are relative frequency (often taken as objective) and Bayesian subjective measures. The formal probability distributions have various properties, which define informational constraints imposed upon the agent in forming this numerical representation of his state of belief. The subjective notion of probability requires for universality that agents can have states of belief about non-repeatable events derived from imaginary repeated experiments. Whereas the idea of probability as relative frequency over n trials is readily comprehensible, the idea of probability as a "feeling of likeness" of a unique event is, as Shackle (1967,1972) has repeatedly pointed out, much more difficult to grasp. It involves the idea that individuals can see patterns in diversity; that they can form generalisations over non-repeatable events.

The structure of my argument is as follows. First relative frequency is examined, and it is shown why it is particularly inappropriate to economic subject matter. The reasons advanced are related to the discussion of method in chapter two, and in particular of causality. Second, subjective or Bayesian approaches are examined and criticised. Two sorts of objections are advanced: that there are theoretical objections to behaviouralist methods of inferring from action underlying mental states, and secondly the evidence available (while not as I have argued decisive) from the psychologists is not supportative. The conclusion is that the assumption of universal existence and universal use of probability is unfounded. Hence rational expectations are undermined, even if conducive

- 1. Lucas (1978) for example builds a model where the entire subjective probability distribution coincides with the true objective probability distribution.

to survival. Hence on the feasibility criterion the theory of enforced maximisation collapses.

(a) Relative frequency

The differences between the relative frequency and personalistic theories cannot be contrasted too strongly. The former, in stressing probability as a property associated with repeated random experiments, can be criticised from an economic point of view by stressing the absence in economic data of the required kind of repeatability. And from a theoretical point of view, the 'stochastic', 'random' nature of such a world needs to be defined to explain why repeated experiments are not identical (Hicks, 1979, p.106). The passage of time in economics is irreversible, implying that the past and the future are different (Hicks, 1976, p.135). Now of course there exists many occurrences for which, from actual or hypothetical experimentation, individuals can and do form inductively-based predictions of the future. The probability of heads in coin-tossing is an example. But the critical question is whether most or all economic behaviour is of that kind. Clearly it is not, in that the background conditions within which economic behaviour takes place change in a way that they do not in coin tossing. The claim made by rational expectations theorists is that the underlying structure is stochastic and stationary (Lucas, 1977, p.15). That is the claim that I am resisting, though it is not easily refuted. Lucas and Sargent both refer to a deep structure of preferences and technology which have the necessary characteristics [1], everything else in the economic structure being erected upon these

1. See p.222 above.

basic characteristics. And in defence they would appeal to the argument of taste constancy outlined by Stigler and Becker (1977) (which was rejected in chapter four above).

The dispute then concerns the nature of the structure, and whether the economic environment is or is not homogeneous over a period of time [1]. The decisive question from relative frequency is whether or not ceteris is or is not typically paribus. In particular, the actor working on relative frequency would have to know in advance whether the condition held or not. In chapter two, the Hicksian distinction of strong and weak causality was introduced, and the claim made that strong causality was a rare if not impossible occurrence in economics. That argument rejected relative frequency in economics as a universal explanation of the formation of probability distributions for decision-making under uncertainty.

There is one further piece of evidence against relative frequency in economics. It is the frequency with which structural breaks are observed in time series. It has however been widely believed that, whereas structural breaks prove difficult in other expectations theories, they pose no direct problem for the REH. I want to turn an idea developed by Lucas, the so-called Lucas Critique, against relative frequency information. For just as the structure of an econometric model changes with the introduction of a new policy, and thus the period before and the period afterwards are not strictly comparable on the same structural model, so to the revision of beliefs in the light of new information alters the structure, of which as I have argued these beliefs are a part. There is therefore a structural

1. See Keynes' (1939) review of Tinbergen for an early famous discussion of this.

break, in the sense of a change in structure, every time a new piece of information is available. The relative frequency approach assumes implicitly that the structure does not alter. What Lucas is really claiming is that, while there may be structural breaks in surface behaviour (the policy domain), at a deep level of preferences and technology, these cannot occur. The natural question to ask is why not ? The answer which the rational expectations theorists give, without defense, is that they are ruled out by assumption.

(b) Subjectivist Bayesian accounts.

The objections to relative frequency approaches are not decisive against probability as a whole. They only stand against the rational expectations model to the extent that it requires an objective repeatable structural model. The subjectivist account requires only that the individual be committed to credal states expressible in terms of probabilities. Such accounts are ultimately theories of consistency about beliefs, but they do have a necessary auxiliary theory about the way in which individuals arrive at these probabilities. Subjective beliefs cannot be directly externally known; the subjectivist assumes their consistency, and considers indirect methods of discovering them. But the subjectivist is not directly concerned with the relation of the beliefs to reality in the way that the objectivist is. Cohen & Axelrod (1983,p.30) point out that Bayesian techniques are useful when updating beliefs where new information can be readily incorporated into a model which is correctly specified, but are much less use when an incorrect model is used. And in neglecting the realism of the model, such a theory is not directly interested in the degree of ignorance of the actor, but only the

consistency of his ignorance. As Eells (1982,p.5) put it:

"Bayesian decision theory is as applicable to the deliberation of the ignorant and inexperienced as it is to that of the knowledgeable expert; and it is as applicable to the deliberation of a monster as it is to that of a saint."

It is precisely this point that leads Lucas (1980, p.223) to argue that the Bayesian view has little predictive power. Probabilities that agents employ must be known in order to predict and be related to actual frequencies observed. This implies that, if the uniqueness of events is stressed with the possibility of non-repeatability and non-predictability, then rational expectations has little or no empirical content. Rational expectations takes a view as to the relative merits of alternative sets of beliefs, by comparing them with the 'true' structure. The Bayesian compares only in consistency terms. Given this apparent lack of structural concern, it is remarkable how some rational expectations theorists have combined the Bayesian approach with their structural-model assumptions [1].

The Bayesian view has been axiomatised by Jeffrey (1965) for propositions, and by Savage (1954) for the more familiar gambles, in such a way as to guarantee consistency on the part of the agent. The Bayesian ideal is that, as Levi defines it (1980,p.xiv):

"Rational agents should always be committed to credal states of probability judgement representable by unique probability measures on

1. In particular see Cyert & DeGroot (1974). Resisting the Rational expectations-Bayesian connection, see Lucas (1981, p.223).

the grounds that such an ideal prohibits suspension of judgement between rival numerically precise credal states relative to the same body of evidence."

There are two parts to such a view: a static theory about consistency of beliefs, and a dynamic theory of belief-revision in the light of new information. The static approach has associated with it the axioms of subjective expected utility theory, which themselves have been empirically questioned [11].

The dynamic (belief-revision) part of the theory operates in terms of Bayes theorem. An agent rationally changes his beliefs by conditionalisation. That is, if some new evidence comes along in the form of the proposition E, then the new state of credence or attached probability should be the old credal state conditional on the new evidence, E. With this dynamic part of the Bayesian approach, there are a number of difficulties. Here I am not so much concerned with the method of conditionalisation but rather with the relation between the Bayesian statistical approach and rational expectations. It should however be noticed that the theory assumes the priors; it does not tell one where they come from. If they are the posteriors of previous priors, then the subjectivity becomes more difficult to comprehend.

1. In particular by the Allais paradox (Allais 1953), and by the work of the psychologists. See Slovic & Lichtenstein (1983).

Let us now examine some of the consequences of the Bayesian view, with implications for rational expectations and convergence. It is important to realise that, given any 2 individuals each with the same information set, it is not necessarily the case that they form the same probabilities, ie $P_a(i)$ does not necessarily equal $P_b(i)$. For the Bayesian this is not a contradiction [1], whereas for the relative frequency theorist it is. For rational expectations, if the information sets are identical, then the two individuals hold the same theories; and if they hold the same theories, they also hold the same beliefs. Thus $P_a(i) = P_b(i)$.

The second consequence of the subjectivist state of belief is that, given any two individuals, each with the same information set, and the same probability judgements at time t , if some new information becomes available at time $t + 1$, it is not even necessarily the case that probability judgements are revised in the same direction. If individuals are permitted to be subjective concerning the original judgement, why should they be assumed to revise judgements in the same direction in the light of new information?

If this excessive subjectivity [excessive in the sense of compatibility with any judgement, following Lucas (1980) p.223) and Levi (1980,p.141)] is to be avoided, then rather demanding informational assumptions are required. In particular, it is assumed that each information set generates a unique probability distribution. The only case

1. Cohen (1981, p.320).
2. Unless the subjective probability coincided with the unique objective probability.

where this would be true is if all individuals were subjectively identical [2]. Then a representative agent could be selected and described [1].

For rational expectations it is clear that if agents react differently to a new piece of information, then convergence is not guaranteed, unless selection unambiguously acts against deviations from the true model. Indeed we find quite often in rational expectations literature that the assumption of 'common minds' in the sense of the assumption of similar response to the same information set and changes in it. The assumption is interesting for the possibility of selection and maximisation because it turns out, as will be seen, that a degree of inefficiency, and hence non-maximising behaviour, is a necessary condition for arbitrage to be possible, and hence selection to be profit maximising. Some people must fail to maximise in order for maximising to be selected for. A well known example of the common knowledge assumption is in the convergence argument to the perfect foresight saddlepoint equilibrium [2]. A weak associated assumption of this RE equilibrium is that individuals will not willingly participate in an explosive economy. For if any one individual acts irrationally the saddlepoint will not be reached. Hence all must act identically for convergence, and subjective freedom of choice is not permitted. The theoretical individual is allowed whatever preferences he chooses (though even that is questionable here); what he is not permitted is a differing reasoning pattern. Individuals' logical procedures for generating predictions from theories must not deviate.

1. One form of this argument is that human nature is essentially a constant, yielding 'common' minds. Such a view violates most conceptions of evolution, as pointed out above, ch. 4.

2. See Begg (1981), p.35-41. See footnote 1, p.151 above.

The possibility of differing reasoning patterns implies that even if knowledge is 'common', freely available at zero cost, divergence may still occur. However in the literature it is the differences and costs of information which has been exploited in the 'neutrality' results. However it is typically exploited as between individuals (private sector agents) and government; but not between individuals. That which might exist between individuals could however be the source of marked instability. If no two individuals have 'common knowledge', behaviour is likely to diverge markedly at a point in time. Further increasing the knowledge of all agents by the same amount will not necessarily imply that the direction of interpretation goes in the same direction.

But what if agents do have common knowledge? Is an informationally efficient market possible? The answer is that it is not, as Grossman and Stiglitz (1980) point out. Agents with the same information sets will not trade for speculative reasons, and if information is costless, there will be no profit from arbitrage. The latter case is the one examined in detail by Grossman and Stiglitz. They state the problem as follows (p.393):

"If competitive equilibrium is defined as a situation in which prices are such that all arbitrage profits are eliminated, is it possible that a competitive economy always be in equilibrium? Clearly not, for then those who arbitrage make no (private) return from their (privately) costly activity. Hence the assumptions that all markets, including that for information, are always in equilibrium and always perfectly arbitrated are inconsistent when arbitrage is costly."

The implication of this result is that, in order for agents to act in such

a way for markets to function efficiently, there must exist some degree of inefficiency which can be exploited by rent-seeking agents. A Bayesian with 'common knowledge and a 'common mind' would be able to form and revise rational expectations; but if he did so there would be no speculation. The incentive to enforce maximising beliefs exists only if at least some agents do not do so.

- (c) Theoretical objections to behaviouralist models of uncertainty

Having explained some of the associated problems of both the objectivist and subjectivist accounts of the formal system of probability, a necessary representation of uncertainty for enforced maximisation, I now turn to two sets of arguments which deal with the Ramsey-Savage experiments designed to reveal beliefs in a probabilistic fashion. First objections are raised in principle against behaviouralist models in general, of which the Ramsey-Savage theory is an example, and in the next section, the psychological evidence is discussed.

The central problem which confronts behaviouralists is that mental states are unobservable. The behaviouralist observes action-choices and tries to infer information from them about the underlying mental states. The Ramsey idea is that an agent can be induced to reveal his probability distribution by means of an experiment. If a preference relation satisfies certain axioms, then there exists a probability function and a desirability function (u) such that subjective utility can be both calculated and compared (the latter because of cardinality and the diminishing marginal utility of money). In essence, a representational theorem is proposed; the underlying mental state being defined as that which produces consistent choice. The agent is offered bets or gambles in order to reveal the number

between 0 and 1 which itself reveals the underlying state of credence or belief. There are two objections: the possibility that judgement might be suspended, and the effects of the experiment is changing the preferences which the observer is trying to ascertain.

Let us take the former first, and note the similarity between this problem and one in revealed preference, as the objections turn out to be the same [1]. In particular, just as the agent cannot reveal indifference, so one cannot hold out in a Ramsey-Savage world for the suspension of judgement. That means not that two outcomes cannot be equally likely, represented by equal bets, but rather that the suspension of judgement is inadmissible. Indeed Ramsey (1926) states the behavioural foundations of his theory explicitly as follows (p.72):

"When we seek to know what is the difference between believing more firmly and believing less firmly, we can no longer regard it as consisting in having more or less certain observable feelings ... The difference seems to me to be in how far we should act on these beliefs."

Thus mental states (the motives and reasons for actions) are reduced to actions. Suspension of beliefs cases arise because of two reasons. Either insufficient information is available at the point in time when belief is being ascertained, or two or more events may be strictly non-comparable. Individuals may think that at some future date sufficient (or at least better) information will be available, and remain 'flexible' until then, or

1. On criticisms of revealed preference, which is analogous with discussions here, see Sen (1973, pp.60-1) on indifference, and (pp.71-2) on behaviouralism in general.

they may be strictly indifferent. As Hicks (1979,p.114)[1] has proposed to cover this last case, there are three possible statements about a pair of alternatives, not two:

"We must say that of two alternatives, on given information, either A is more probable than B, or B more probable than A, or they are equally probable, or that they are not comparable."

As Hicks goes on to point out, that makes probabilities partially orderable. But partiality is not sufficient unless we wish to claim that choices are only made between acts which are ordered probabilistically [2]. This is clearly not so. In the same vein of argument Keynes, defining probability as "the degree of rational belief", carefully distinguished the following cases in his 'Treatise on Probability' (1921,p.33):

"There appears to be four alternatives. Either in some cases there is no probability at all; or probabilities do not all belong to a single set of magnitudes measurable in terms of a common unit; or these measures always exist, but in many cases are and must remain, unknown; or probabilities do belong to such a set and their measures are capable of being determined by us, although we are not always able to determine them in practice."

1 . See also Shackle (1967).

2 . There are some possible relaxations of these axioms from the strict semantics of the probability $p(x) = z$, where z is a real number, s.t $0 \leq z \leq 1$. These include: (1) $p(x)$ s.t. $z \leq p(x) \leq y$, where z and y are real numbers, $0 \leq y \leq z \leq 1$ (fuzzy probabilities); (2) $p(x) \leq p(y)$ (relative strength); and (3) $p(x)$ s.t. $0 \leq p(x) < 1$ (some positive number). Mention should also be made here of the possibility of temporary suspension of judgement pending new information discussed above.

The possibility of non-comparability cannot be ruled out, as the behaviouralist does.

The second problem with this kind of approach is that the world with the probability-revealing experiment (call this world A) is not the same as the world without the probability-revealing experiment (say B). And it is not at all clear that the agent's beliefs in (A) and (B) are identical, or even sufficiently identical. I argued above that belief formation is an expensive occupation; it takes time and effort to discover information, and work out how to integrate it into one's beliefs. Experiments direct attention, and involve causing the agent to divert attention to the question he or she is being asked. Experiments influence behaviour in this sense and also in the degree to which the actor strategically responds to the experiment. Potential and actual acts are not necessarily equivalent. Clearly some experiments will infringe more than others on underlying credal states, but the problem for the theorist is to sort out which do and which do not. It is not clear that any external information is available about what the appropriate causes are.

- (d) Psychological evidence against behaviouralist approaches

If there are compelling theoretical objections to behaviouralism, there are also empirical reasons which would lead us to question the Bayesian theory. Such psychological evidence necessarily has to some extent to rely on behavioural methods, and thus cannot in itself be decisive; yet it does have the virtue of allowing us to see how alleged violations of the theory's assumptions and predictions are reinterpreted within the existing framework, if indeed this proves possible.

Empirical evidence suggests that revision does not follow Bayes rule outlined above. This evidence supports a rival hypothesis that decision-making follows a series of heuristics which are less well-defined, and which do not lead to enforced maximisation.

First, the method should be noted, since it is behaviouralistic, and thus open to the objections outlined in the previous section. The approach sets up well-specified laboratory experiments, and reports the behaviour of subjects. Whereas the probability-revealing experiments with gambles were open to the objection that agents would display rationality, the psychologists evidence in finding apparent irrationalities does so in a framework within which agents have strong incentives to display rationality. If subjects are informed that their rationality is being investigated, and are informed about the parameters of choice, and if under these circumstances they still employ non-maximising principles of choice, it is more rather than less likely that in a less well specified real world situation, they will behave less rationally. If however in these artificial experiments, they behave as-if they formed probabilities, as Ramsey and Savage argue, it would not follow that in the real world they therefore would necessarily be so rational. So the argument about the artificial experimental situation is asymmetrical in its effect: it can support the argument for non-maximising behaviour, but less so the maximising one.

The evidence on Bayes rule suggests two conclusions. Some writers [1] have argued that agents display 'conservatism' in the degree of revision of

1. Notably Edwards (1968) and Kahneman, Slovic & Tversky (1983).

priors with new information (reflecting risk aversion). More convincing is the Kahneman and Tversky (1974) evidence suggesting that man is not Bayesian at all [1]. These writers propose alternative heuristics for decision making under uncertainty, including:

(i) representativeness: the probability that an object B belongs to a class A is arrived at by seeing the extent to which A is representative of B.

(ii) availability: the probability of an event is arrived at by seeing how easy it is to remember similar events.

(iii) anchoring and adjustment: agents anchor on a judgement and then tend to make insufficient adjustment in the light of new information. (This is closest to the 'conservatism' argument above.)

It should be pointed out the the Kahneman and Tversky evidence has not gone unchallenged in the literature. An important critique of their findings has been put forward by Cohen (1981)(1982)(1985), who has pointed to the different conceptions of probability which agents might have and stressed the extent to which Keynes' 'weight of belief' notion might be incorporated to explain some of the psychologists findings. As has been noted, the standard mathematical syntax of probability admits of more than one semantics, and in effect Cohen uses two rather than one semantics to reinterpret these findings within, rather than outside, probability explanation.

However, if the psychologists are right, it is obvious that the

1. See also Eells (1982), p.22..

employment of these heuristics will frequently lead to biases, though the direction and extent depends on the outcome of the inconsistencies between them. The inconsistency itself is not a problem, since being consistent may be very costly in time and effort. There existence is compatible with satisficing behaviour, but not maximisation. If people typically follow these heuristics, then selection will not enforce maximisation. It is not that maximisers do not necessarily dominate satisficers; that is a separate argument presented elsewhere. It is rather a feasibility argument: it is too costly to act other than in a satisficing way. This cost of information argument brings us to the final criticism of enforced maximisation: the impossibility of optimising on search costs and benefits, to which I now turn.

(ii) Optimising Search Behaviour

The final objection to enforced maximisation presented here with respect to beliefs concerns optimising search behaviour. Rational expectations with costless information and a true structural model is clearly not a particularly reasonable or indeed useful assumption to work from. At best it provides a benchmark to judge efficiency. This latter view is the one taken by Sargent & Wallace (1975) and Gale (1982) amongst others. This view is here rejected on the argument presented in chapter two that any description or explanatory theory of actual economic behaviour requires that the condition of feasibility be met. All models involve simplifications; but not all simplifications are good ones.

If then rational expectations with costly information is more realistic, since forecasting is an expensive business, it is then a theory about the efficient use of costly information. Specifically, it can be characterised, following B.Friedman (1979,p.25) as follows:

"In its broadest construction it simply states that, as a condition for optimising behaviour, that people exploit information until the point at which the marginal product equals its (perhaps zero) marginal cost."

The idea of optimisation under conditions of uncertainty where search is involved under costly calculations is frequently believed to yield determinate ex ante maximising decisions. This process is somewhat more sophisticated than the pure subjective probability case outlined above. Here agents do not simply have probability distributions and decide on the basis of them; probabilities can be improved by engaging in search

procedures. In this case, an auxiliary hypothesis is needed to determine what is the maximising amount of search activity to engage in. The traditional solution is in terms of the marginal benefits and the marginal costs of search; benefits are to be attained up to the point where the marginal cost of search is less than the marginal benefits. Ex ante the agent does not choose the ex post maximal, as would be the case under conditions of certainty; rather he or she selects the ex ante optimum given the constraint of the marginal search conditions.

This optimisation result is employed to demonstrate that seemingly irrational behaviour from an ex post point of view is apparently rational ex ante. Examples which have been regarded as satisficing cases, are reinterpreted as maximising ones. Indeed Day (1967) claimed to have demonstrated that satisficing reduces to optimisation over time. Rules of thumb, Baumol and Quandt (1964) claimed could be optimal for price-setting. Much later, in the field of monetary economics, Feige & Pearce (1976) tried to demonstrate that simple extrapolation of past behaviour may be optimal in the face of research costs of other causal determinants of inflation [1].

As with other costly activities, search costs may be distinguished into fixed and variable components; the former being considered as investments. Learning a language or acquiring a skill can be considered as capital acquisition activities [2]. Furthermore a distinction can be introduced between short and long run efficiency of search. Optimisation

1 . See also Yarrow (1976)(1977).

2 . The acquired preference literature discussed above in chapter four is of this form.

is thus a two-stage procedure: an optimal capital stock rule augments the further marginal benefits/costs optimisation with respect to variable costs.

Reactions to new information depends upon its interpretations by the recipient. As I argued above, the recipient will try to distinguish between unique and repeated (howbeit imperfectly) events, and between events for which he or she has a priori expectations based upon causal beliefs, and ones where no such beliefs exists, and hence can be treated as, from their point of view, random.

These distinctions make optimisation more complex, and give rise to consistency problems. Yet there is another difficulty which has not generally been noted. It is that 'optimising', 'satisficing' and choosing a 'maximal' outcome are not equivalent. The confusion between satisficing and ioptimising under uncertainty pervades the literature. One way of demonstrating that they are not equivalent is to show that the traditional approach leads to an infinite and hence indeterminate regress. The reasoning behind this is extremely simple. If information is costly, then the costs of calculating the costs and benefits of search cannot be assumed to be negligible, and must be taken into account. The point is that presenting the problem of decision-making under uncertainty as one requiring that agents equate the marginal benefits and costs of search, assumes that they know what these costs are. There is, of course, no a priori reason why this should be the case. If it is not, then we have to go one stage further back, and equate the MBs & Mcs of calculating the MC of search, and similarly the MBs and MCs of calculating the MB of search. This infinite regress argument in its simplest form is that in order to

choose it is necessary to have information; in order to choose how much information to acquire, it is necessary to have information about information, and so on. It makes no reference to the choice rule as such [1]. The regress follows immediately. Another way of expressing it is as an example of a logical fallacy of self-referral. Super-optimisation cannot be justified by repeated referral to sub-optimisation problems. It is an argument by definition, not by relation [2].

There are at least two possible responses to this regress argument. The first is to claim that the costs and benefits are in fact known. For example search costs might be constant, or alternatively it might be assumed that the probability distributions are known. But if costs are constant, it is highly unlikely that benefits are. Investment activity is inherently very uncertain, as Shackle in particular has continually pointed out [3]. The probability assumption has been dealt with above.

The second reply is perhaps more interesting. It admits of the infinite regress, but assumes that it tends to zero. In practice, it is argued that we can assume that the search costs tend to be negligible, beyond the first round. However there are two remaining difficulties, one logical and the other empirical. The logical point is that the decision remains a non-optimising one, whether or not there is a tendency to zero. Empirically, the case is not proven; but one could imagine cases in which

1. Thus the principle of random choice cannot be an objection to the force of this regress argument against maximisation.

2. Winter (1975), p.83, hints at this logical problem without working it out.

3. Shackle (1939).

the regress were explosive.

The result of this regress argument is quite startling. There does not exist a maximising decision to be made, in the form of optimisation, in conditions of uncertainty when information is costly. At some point the agent stops the procedure and adopts a satisficing rule, however defined.

5.7. CONCLUSION

In this chapter I have taken the beliefs component of an economic explanation. The theory of enforced maximisation for beliefs is the theory of rational expectations. Rational expectations are profit maximising expectations. The chapter has shown why such a theory is unsuccessful. The objections raised have been of two types, the structural model assumptions and the use of probability representations. I have shown that there are no good reasons to suppose that there exists a true structural model, and I have argued this point by claiming that beliefs are part of that structure, and that they will not necessarily converge. Selection works to the advantage of at least some sorts of 'false' beliefs. Furthermore, since beliefs are based on theories, and theories are necessarily simplifications, beliefs like theories are in this respect inaccurate. In a world of imperfect beliefs, acting as if one had perfect ones might not be very successful.

The probabilistic representation of uncertainty, widely assumed in economics, and necessary for maximisation of expected utility, is not universally applicable to decision making. There are theoretical objections to relative frequency, based on the nature of economic time series. There are both theoretical and empirical objections to the subjective representation of probability. These include the method of justification (behaviouralism), and the problem of the interpretation of Bayes rule of revision, and empirically there is evidence consistent with more simple heuristics. Assuming a probability distribution assumes that people can solve the problem of the optimal degree of search for information. This, I have shown, involves an infinite regress.

The refutation of rational expectations as one basis for enforced maximisation on grounds of causality and feasibility implies that the selection argument will not succeed for beliefs. It remains to show that it is also inapplicable to firms.

CHAPTER SIX: FIRMS AND ANALOGIES

"Confidence in the maximization-of-returns hypothesis is justified by evidence of a very different character ... unless the behaviour of businessmen in some way or other approximated behaviour consistent with the maximization of returns, it seems unlikely that they would remain in business for long ... The process of "natural selection" thus helps to validate the hypothesis - or, rather, given natural selection, acceptance of the hypothesis can be based largely on the judgement that it summarizes appropriately the conditions for survival". Friedman (1953,p.22).

6.1 INTRODUCTION

Whereas preferences and beliefs were in chapters four and five treated in a reductionist fashion, the evolutionary argument with respect to firms is typically employed in the weaker sense of an analogy. There are however a series of problems with this methodology. They arise in three senses: because of the dual use of evolutionary theory for both reduction and analogy, with respect to arguments by analogy in general, and with respect to the level of selection.

These three are related. The first questions the use of analogy in explanation, and whether it is valid to treat the two individual-regarding components of an economic explanation in a reductionist fashion, and at the same time treat the third component in an analogous manner. The relationship between individuals and the firm within which they operate raises specific questions about the theory of the firm. In particular, given that the firm is run, staffed and managed by individuals, how is competitive selection operating on firms related to the incentives of individuals who perform actions within the firm?

The objections raised in this chapter are primarily methodological, concerned with whether the evolutionary analogy can in principle be used as a defense of enforced profit maximisation by firms in the Friedmanite manner. Modelling specific selection processes or a particular theory of economic competition are not discussed here. My argument is a negative one, showing that the justification of maximising behaviour cannot rest on an evolutionary defence. In the process of establishing our conclusion, I will examine the relationship between utility and profit maximisation, the constraints on managerial behaviour given various assumptions about their

objectives, and the selection mechanism of competition.

There are a series of reasons why it might be thought that maximisation of profits might not be enforced on otherwise deviant firms and managers. The first of these are what I shall call internal reasons. The internal conflict between managers, and the informational losses associated with hierarchical decision procedures might lead to non profit maximising alternatives. The second possible source of non profit maximising behaviour I shall call external reasons. These concern inter-firm competition and selection. The third possibility is that although there exists a markets for managers, it is an imperfect one, and thus the 'efficient market for managers' hypothesis is incorrect.

Each of these possibilities will be examined below. But first the methodological use of analogies in general should be discussed. This is the task of the next section. I then go on to consider the existing literature on the use of evolutionary analogies in the theory of the firm, before turning to the substantial questions.

6.2 THE METHOD OF ANALOGY

As J.S.Mill observed, "there is no word ... which is used more loosely, or in a greater variety of senses, than Analogy". In this section I shall try to restrict that variety by relating it to explanation. In chapter two I argued that explanation involves the ascription of causality between variables. Thus to the extent that an analogy explains behaviour, it is required that it has some relation to causality. Typically it is used as an heuristic, a guide to comprehension by pointing to similar characteristics between what is to be explained and something else which has already been explained. To be analogous, some property or properties, and relations between them, must be held in common between the analogy and that which is to be explained. Nagel (1961, p.108) points out:

"The widespread use of metaphors, whether they are dead or alive, testifies to the persuasive human talent for finding resemblances between new experiences and familiar facts, so that what is novel is in consequence mastered by subsuming it under established distinctions".

Analogies may be indispensable heuristics to explanation. But there are good and bad uses. Drawing an analogy may include seeing a particular piece of behaviour from the point of view of the analogous case. The analogy gives a perspective from which to interpret and hence classify it. Achinstein (1968, p.208) stressed this aspect of perspective:

"to speak of an analogy between X and Y is to speak of (certain types of) similarities between otherwise unlike items X and Y (or of a

noting of such similarities), attention to which may enable one to think of and describe X from the point of view of Y (a point of view that might not have been obvious), and thus to depict X in a more enlightening way, one that may help to make plausible certain claims about it".

Analogies are not however identical with the subject under discussion. Something is left out. Thus a good analogy is one where the points of difference as well as the similarities have been spelt out. It thus depends on the purpose for which it is being used. While then there may be useful ways in which economic competition and natural selection can be compared, whether the analogy is successful depends on what is or is not included. I shall argue that it is not useful in the context that Friedman and others have used it for enforced maximisation.

If the analogy is somewhat loose in that it allows for the existence of differences as well as similarities, there may be more than one way that it can be expressed. There have been a diverse list of possible relations between the terms or concepts of biology and economics [1]. As was seen in chapter two, genes have been compared to firms as a whole, individual managers' success, and to the routines used by firms [Winter (1975,p.101)]. Mutations have been applied to innovations, investments or new routines [Winter, ibid, p.102; Schumpeter (1956)]; survival to maximum profits, normal profits, or the avoidance of bankruptcy. Reproductive success and profits in the long run have also been related. The diversity of comparisons requires that a more detailed look be undertaken of the

1. Hirschleifer (1977) p.50, presents a table of analogies.

literature on evolution and the theory of the firm, before the main critique of analogous enforced maximisation is undertaken.

6.3 THE LITERATURE

In chapter three, the interest in natural selection with respect to firms was traced directly to Marshall, and the influence on his thought noted. It was also pointed out that as far back as Adam Smith, some parallels are forthcoming. Yet the modern use of enforced maximisation for firms begins with the Friedman assertion quoted above (p.262), to the effect that even if the realism of assumptions remains an issue in theory appraisal, economists could be happy with profit maximisation, because deviant behaviour would lead to elimination by the forces of competition. Competition guaranteed profit maximisation, just as natural selection (Friedman thought wrongly) guaranteed that the existing species were perfectly adapted.

The Friedman claim was an aside in his methodological attack on those who sought to show that firms used non-profit maximising procedures. It had been preceded by an article (to which Friedman does not refer) by Alchian (1950), who argued for a much weaker relation between competition and profits, but not maximum profits. He had been concerned with the external constraints on firms by external selection, though Enke (1954) pointed out that the form of that competition affected the outcome. Further contributions considered internal constraints, and the role of managers. These included a paper by Penrose (1952). In the introduction to her later book (1959), she repeated the argument advanced in this early piece (p.2):

"In addition to the traditional approaches, there have been sporadic attempts to develop theories of the growth of firms using biological analogies and treating firms as organisms whose processes of growth

are essentially the same as those of the living organisms of the natural world. There are many difficulties with this type of analysis, one of the most serious being the fact that human motivation and conscious human decision have no place in the process of growth. This alone, I believe, is sufficient ground for rejecting such theories of the growth of firms. All the evidence we have indicates that the growth of a firm is connected with attempts of a particular group of human beings to do something; nothing is gained and much is lost if this fact is not explicitly recognised."

There were then in this 1950s literature two main strands of objection to the evolutionary analogy as a guarantor of profit maximisation: internal reasons associated with managers motivation, and external reasons concerning the force and effectiveness of competition. In the 1960s the evolutionary argument got little direct attention, although the fall-out of the debate on Friedman's irrelevance of assumptions claim had some indirect importance. Machlup (1967) is perhaps the most widely quoted in this debate with respect to the marginalist theories of the firm which Friedman had sought to justify. He maintained that (p.19):

"since it is clear that their [the managers] long-run incomes are jeopardised if profits go below the acceptable rate of return, maximisation of managerial incomes and maximisation of profits come to the same thing if competition is effective".

Machlup was thus pointing to the constraints on the results of the separation of ownership and control which Marris (1964), Penrose (1959) and Baumol (1962) had suggested might occur. These managerial constraints will be the particular concern of section 6.4 below.

There was one major contribution to the use of evolutionary analogies in economics in the 1960s which took a markedly different line. It was Winter's 1964 article which carefully spelt out on the one hand the limitations of the relation, and the other on its use to construct a theory of dynamics. He has subsequently produced a series of articles propounding an evolutionary theory of growth, culminating in a book with that title in 1981 with Nelson. The argument is Schumpeterian. Since I shall ^{consider} some of the arguments below, and since Winter does not claim that the outcome of the selection process is maximum profits, I shall not deal with it extensively here.

6.4 THE POSSIBILITY OF NON-PROFIT MAXIMISING BEHAVIOUR: (1) INTERNAL SOURCES

(i) Profit maximisation and utility maximisation

In the literature on firms' objectives two questions have been concentrated on. The first is between maximisation and satisficing behaviour. The second is between different candidates for maximising, be they growth, sales, profits or some more general managerial utility. The first concerns the description of behaviour, whether firms could in principle maximise; the second concerns the object or goal towards which behaviour is directed.

In this section, the gap between different maximisation models is explored, and the extent to which separation of ownership and control might imply maximising behaviour, which was not based upon profits as the sole objective, is investigated. For if the selection argument is directed towards eliminating non-profit maximising behaviour, and non-profit maximising was consistent with maximising utility on the part of the individuals in the firm, then selection would tend to reduce rather than increase the population of utility maximisers. Essentially I shall argue that whether selection operates in favour of utility maximising behaviour depends on the content of preferences. These will themselves be selected for: managers with the 'correct' motivation will succeed. But then the evolutionary argument is not about maximising utility itself, but rather what constitutes utility.

There are three questions to face: (i) to what extent is the activity and effort of the individual directly related to output consequences; (ii)

to what extent is the control of the firm separated from managers; and (iii) to what extent do the interests of managers differ from owners. In the next section, I will examine possible ways in which enforcement, selection and competition might enforce profit maximisation on otherwise reluctant managers and workers and their validity.

(ii) Individual effort and final output

If each individual's marginal product could be measured, if work could be directly related to output, then rewards (factor payments) could be directly adjusted as an incentive to the maximisation of output, given inputs. Technical efficiency would not be impeded. It is assumed that income (the wage) enters as the only positive variable in the worker's utility. Work and effort are negatively related to utility.

Frequently however marginal products cannot be separated since much production utilises joint-production techniques. Indeed the existence of firms partially depends on the possibility of joint production [1]. Production is typically a team, rather than an individual activity, and competitive selection operates at the team rather than individual level. Two teams may have some efficient and some inefficient members in each. If A beats B in the market, some inefficient workers may be selected for rather than against. The problem with team activity is that the marginal products of individual inputs are not directly measurable, either because of input combination, or because of the costs of measurement. The team is a co-operative solution to maximise revenue, yet each individual member has

1. Coase's (1937) article on the nature of the firm stresses the importance of transaction costs in market and firm coordination. Implicitly this is premised on transactions costs scale advantages of joint-production.

an incentive to free-ride on the others' co-operative improvements if individual marginal products cannot be measured. Everyone might agree that the optimal solution is that nobody shirk, but each is better off if he or she shirks, and nobody else does. Work contracts cannot be completely specified with respect to output, making effort at least partially discretionary [1]. The optimal amount of shirking for the team as a whole is zero, while for the individual it is greater than zero, to the extent of the impossibility of detection or the transactions costs of monitoring each individual's marginal product. But if each knows that every other member has an incentive to shirk because their marginal products are not directly measurable, he or she will choose not to be in the worst position of cooperating and maintaining effort without reciprocal effort on the part of others. The problem is of the Prisoners' dilemma type: the collusive solution is optimal, but free-riding gives an incentive to move to the Cournot-Nash outcome [2].

One solution to the problem is provided by Alchian and Demsetz (1972). They argue that the team will jointly agree to appoint a monitor or foreman to act to prevent shirking, so long as the cost of the monitor is less than the benefits from the collusive solution over the Cournot-Nash outcome. There is however a further problem of the incentives of the monitor himself, which Alchian and Demsetz solve by allocating to him the residual income of the firm dependent on his success.

1. Leibenstein (1976) makes the point in his X-efficiency theory, but from a different direction.

2. There are a number of possible strategies to adopt in Prisoners' dilemmas, one of which is the robust 'tit-for-tat' principle. See Cohen & Axelrod (1984).

The Alchian and Demsetz result is sufficient, ^{where inputs are joint} to reject the hypothesis that firms maximise total potential profit. It relies on two factors - the existence of costs of measurement of inputs and the incentive structure of co-operating individuals, where effort enters negatively into their utility functions. It should also be noted that monitoring will increase output efficiency only by increasing the amount of work and effort put in by the workforce. Effective monitoring does not make the work process technically better [1].

(iii) Different Utility Functions as between managers.

The Alchian and Demsetz result separates individual from group or team incentives. The question next arises as to what kind of incentives individuals respond to. Individuals may not respond to financial incentives, such that relating wages to marginal products ex post may not in the next period bring forth the 'correct' marginal effort. People may not be ^{completely} materially motivated; or rather there may be other components amongst their preferences. Preferences are complex rather than naively simplistic, and may have a variety of sources as I argued in chapter four. If these are causal, as I also argued they may be, they will affect the relationship between types of incentive and outcomes. The Alchian and Demsetz analysis is based on strong assumptions. In particular the only form of informational inefficiency is the value of individual marginal products. Furthermore it is implicitly assumed that all members of the team have the same utility functions. The former evades the difficulties associated with insufficiency of information for the subjective expected

1. On this distinction between 'output' and 'technical efficiency', and an interpretation of Alchian & Demsetz, see McPherson (1983).

utility maximisation hypothesis, and hence represents one potential source of satisficing behaviour. The latter avoids the difficulties associated with conflicting objectives of members of the team, and hence the problem of maximising over a vector of alternative goals, rather than a simple unique one. I take up the latter problem here, having dealt with the former in chapter five above.

The vector approach to individual managerial objectives yields maximising strategies if the components of the vector do not conflict, or where trade-offs are defined between the components by appropriate side-payments to dissenting managers. In the absence of well-defined trade-offs, and/or in the presence of costs of arbitration, satisficing behaviour results [1]. This second source of satisficing is described for managers in Cyert & March (1963). Let us first explore why satisficing behaviour is the outcome, and then consider the wider question of whose preferences are included. The problem is constructed for managers, yet total utility for the firm includes the utility of each individual in that firm - workers and managers.

One way of thinking of the satisficing result is that it is the outcome of attempting to aggregate incompatible preferences. Assuming that preferences differ, it is not clear which of a set of objectives should dominate, unless some aggregation rule is proposed, or a dominance principle is attached to particular preferences (eg of the chairman or managing director). The problem is compounded by the question of the level of preference. The goal of profit maximisation is itself vacuous, unless

1. The argument here is effectively the same as advanced in chapter four for utility functions, considered generally for any individual.

policies are proposed. It is a method of policy evaluation, not a producer of policy. The distinction is between procedures for bringing about certain outcomes conducive to an objective, and the objective itself.

The problem is not that which Arrow (1951b) considered in aggregating preferences on the basis of utility information. [1] The conditions and nature of the choices are different. For Arrow posed the question of whether individual preferences could be aggregated to produce a social ordering. In the context of the firm, alternatives are not ranked; rather a particular policy dominates. Also the problem of each individual translating his preferences into action needs to be considered. So not only is this a problem of creating an aggregate objective for the firm out of individual preferences, but also individual actions may conflict to produce a non-optimal outcome.

An ^aan~~h~~alogy with Arrow, but no more than that, is the possibility of solving the firm's problem by dictatorship. The chief executive or chairman of the firm may impose his preferred objective on members of the firm, producing a unique objective function. However, referring back to the above distinction between the objective and the procedures for bringing it about, a preferred objective of the dictator requires interpretation. Firms, for informational reasons [2], are typically hierarchical in structure. At each level within a hierarchy, there is a loss of information. To connect individuals informationally, as the number of

1. Winter (1964) p.33n and Scherer (1971) both make the point of an analogous problem between the two existing. Simon (1955) relies more heavily on the limited mental capacity of individuals.

2. Williamson (1975).

individuals increases arithmetically, the required number of informational links increases geometrically. Compensating for the informational loss requires that decision-making be delegated. But as this occurs the dictatorship is weakened.

(iv) Different utility functions between managers and workers.

The above discussion of differing objectives focus`ed on managers. Managers may have objectives other than profit maximisation, and since the firm requires an objective, there may be a problem of forming such a function. Utility maximisation allows for many different sources of utility, whereas profit maximisation does not [1]. With respect to the workers, work may directly enter into their utility functions seperately from the wage. Workers may have a view as to how their labour is allocated, deriving from diverse motives such as prestige, power, tolerance of boredom and monotony, and so on [2]. Rather than a simple function of a work/leisure trade-off between the two, workers may have preferences with regard to the content of work. Hence the well-being of the individuals in the firm may be reduced by certain profit maximising activities even if that profit is attained with higher wages. The desire for worker-participation in decision-making reflects a preference for policies which deviate from profit maximisation [3.].

There are at least two ways of interpreting the desire for worker

1. See Scitovsky (1943).

2 . These can be reinterpreted in the traditional way, but it does not follow that it is a good classificatory explanation.

3 .. See Ugo Pagano (1983) on the relationship between work and welfare.

participation. Either workers wish, via control over decisions to increase their factor payment, or they wish to express a preference over the methods of production which takes account of the relative disutility to each individual of each productive activity. Since these are likely to vary, such an activity is informationally very demanding. Hence a trade-off between the fall in factor payments because of the costs of information, and the extent of work-practice change recognising the preferences of workers, is required.

Including workers' preferences in utility maximising activities of firms has the consequence of driving a larger wedge between maximising profits and maximising social welfare, as some sum of individual welfare of the members of the firm.

(v) Managers and owners

The possibility of non-profit maximising behaviour by firms typically arises, in the literature, because owners and managers are in the main distinct and separate groups in the modern corporate economy, with distinct and separate objectives. Managers are assumed to be concerned with their own salary; shareholders with dividends and capital gains. Both assumptions are approximations: there are actions which are ruled out for legal or moral reasons whether or not they contribute to profit or salary. The objectives are constrained.

The evidence in the literature combines information and enforcement costs on the part of shareholders with an increasing trend towards concentration. Berle & Mean's (1932) pioneering study of ownership and control pointed to this dichotomy. Evidence has generally supported the

idea of separation, though within it a series of issues arise, both empirical and theoretical. These include the shareholdings of managers, the concentration of shares amongst shareholders, the minimum amount required for an enforcing condition (more on this in the next section), and the extent of disposition of shares. The *degree* of concentration of capital is itself not free of ambiguity in its effect; its rate might be argued to increase the degree of complexity of managerial decision-making and hence the size of asymmetry of information as between managers and shareholders. But it may also be the case that ownership in the stock-market is simultaneously concentrated amongst shareholder institutions, particularly those related to risk and insurance.

The possibility of a difference of objective does not necessarily imply the actuality [1]. Its actuality depends on the possibility of enforcement, to which I will turn in section 6.6 below.

1 . See on this, Nyman & Silberston (1978).

6.5 THE POSSIBILITY OF NON-PROFIT MAXIMISING BEHAVIOUR: (2) EXTERNAL SOURCES: INTER-FIRM COMPETITION.

In section 6.4, I considered the consequences of different preferences with respect to those people within the firm - workers, managers and owners - and showed how these might create the desire of utility maximising managers to deviate from profit maximisation for the firm. There are then other non-profit orientated components of members' preferences. Thus welfare maximisation of the sum of individual preferences, even if aggregation is possible, is not necessarily equivalent to profit maximisation.

In this section I examine a second source of deviations from profit maximising behaviour. Competition between firms, I shall argue, is insufficient to guarantee the enforcement of profit maximisation, in direct contradiction of Friedman's argument, and indeed in certain circumstances may operate in an alternative direction. There are at least three possible cases where this arises. These include the short-run and long-run maximisation competition, the structure of industry and the form of competition, and the problem of satisficers and maximisers jointly competing. In the next section possible enforcement mechanisms to overcome these difficulties are appraised.

(i) Short-run and long-run maximisers.

Just as in the case of individual behaviour discussed with respect to reciprocated altruism, the firm frequently faces a choice between

gains in the short run and gains in the long run from alternative policies. Firms may find, for example, that while the normal competitive environment imposes constraints on the price of their product, temporary monopoly may arise. There may be an unanticipated shortage, a sudden temporary shift in demand, or some other exogenous shock. The short run response may be to exploit the temporary monopoly situation, but the cost of such action is to compromise intangible assets such as trust and goodwill [1].

Evolutionary theory is, as was pointed out in chapter two, intended as a long-run explanatory theory, yet in the short run elimination will fail to permit the reaping of long-run returns. Too fast a rate of short run destruction reduces long run survival [2]. This latter constraints induces the well-known problem in evolutionary theory of risk-aversion dominating maximisation. Changes in environment over time introduce a degree of relativity. The genetic implication of this [Mayr (1963,p.296)] is that "no gene has a fixed selective value, the same gene may confer high fitness on one genetic background and virtually lethal on another". Furthermore 'gene complexes' (the phenotype) are the object of selection, not individual genes themselves.

Analogous problems arise in the theory of the firm. Risk aversion can be overcome only if the capital market is perfect: the bankruptcy

1 . See on the LR-SR problem in the theory of the firm Hicks (1954). On the economic theory of intangible assets, see Caves (1983, pp.3-7). An example of where it may be necessary to intervene to correct for this bias to the short run is the infant industry case and in patents.

2 . The biological analogy of this trade-off was posed by Haldane (1957).

constraint with imperfect information can eliminate (in the short run) certain types of long run maximisation policies. From the point of view of enforced maximisation, maximisation over time thus requires an implausible auxiliary institutional assumption about perfect information.

(ii) Forms of Competition.

A standard result of the traditional theory of the firm is that as an industry becomes more concentrated, the pricing and output decisions deviate further from the Pareto optimality conditions, and firms gain control over the markets in which they compete in price setting.

The perfect competition model is a perfect selection mechanism enforcing profit maximisation. Under the assumptions, the entry/exit option works to sustain normal profits at given prices. Normal profits are defined as those profits just sufficient to induce current firms to continue in the industry, but to be insufficient to induce new firms to enter. One of the difficulties with such a model is that the assumptions and the outcome define a world within which it is hard to see what the incentive is to maintain it. Firstly since information is perfect, all decisions can be made instantaneously for the present and all future dates. Secondly, differential information is a necessary condition for trade [17]. Thirdly, one of the rationales for the existence of firms is that there exist some economy of scale making co-operative behaviour and joint production superior to individualistic behaviour, implying a

17. See discussion of Grossman & Stiglitz (1980) in chapter five above, p.393.

divergence from the perfect competition model [1]. As Arrow (1974, p.33) points out, "organisations are a means of achieving the benefits of collective action in situations in which the price system fails". To these objections may be added the empirical observation that there does not appear to be many (if any) markets which even remotely approximate the assumptions of the model. If the Friedman selection mechanism relied on this type of competitive environment, then it would hardly be worth consideration.

The typical market form has become one of oligopoly: a few interdependent firms which act as price-makers [2]. Models of oligopoly lie between the two extremes: the Cournot solution and the Cartel. The Cournot model is set up to answer the following counterfactual question: what would happen in an oligopoly if interdependence was not recognised? The Cartel model describes the other extreme: what would happen if interdependence was formalised to produce an institutionalised joint-profit maximising organisation. In monopoly, there are not any alternatives to select between (if no potential entrants either). In practise most oligopolies lie between the two, and for most forms the pricing and output decisions are indeterminate.

The actual outcome is a function of the beliefs that the firms have about others' responses, which in turn depend on the structure of supporting beliefs, and on cost and demand conditions. Outcomes are a function of intentions and others' responses. This gives rise to a number of problems. Objectives between rivals may be the same or differ. If they

1. Coase (1937)

2. See for a discussion of the course of the increase in concentration and of its extent, Hannah (1983) and Hannah & Kay (1975).

are the same, then Prisoners' Dilemma difficulties may arise, where the outcome is not the group optimum, yet it is stable, and in that sense an ESS. If the objectives pursued by firms in the oligopoly vary, so will the responses. It has been shown that, where managerial objectives are pursued, in order to elicit the optimal response from others it is nearly always better (somewhat counter-intuitively) to pursue a non-profit maximising goal [1]. The idea is that there exists a distinction between the best strategy and the maximal outcome. Acting directly in a maximising way may not necessarily elicit responses from others which are optimal to one's own profits [2].

(iii) Maximisers and satisficers.

One argument which is often raised in favour of maximising behaviour is that it will lead to results which are superior to satisficing; hence selection eliminates satisficers. Competition between the two could take three forms: (i) in a game played between maximisers and satisficers, maximisers win; (ii) in a game played between satisficers, maximising behaviour emerges; or (iii) in a game played between two or more sets of maximisers, unintended satisficing solutions emerge. The supposed dominance of maximisers gives rise to two objections to this argument. Firstly, referring back to Arrow's discussion above [3], he pointed out

1. Vickers (1985). See also Singh (1975) who points out (p.510) that: "as a survival strategy, attempting to increase relative profitability may be inferior to attempting to increase relative size, particularly for larger unprofitable firms".

2... This is an example at the firm level of Becker's Rotten Kid Theorem. See p.105 above.

3. See ch.5, p.228 above.

that if everyone else is irrational (by which Arrow means non-maximising) it does not follow that in such a situation being rational is the best thing to do. There are then games in which satisficers beat maximisers. But the second point is most important here: the idea of a game between maximisers and satisficers involves an unwarranted assumption. If maximisers and satisficers compete in the same world, as this argument suggests, then uniform assumptions must apply. Yet the rationale of satisficing behaviour is that firms and individuals do not have the necessary information upon which to choose maximising strategies, because of the reasons given in the previous section. Hence satisficing is rational because information is insufficient for maximising. Hence firms cannot maximise. If, on the other hand, information is assumed to be sufficient for maximisation, there is a natural and obvious sense in which maximisers win (excepting the first argument of this section above). Thus the justification of maximisation by virtue of demonstrating its superiority to satisficing rests on an informational assumption. Hence it is not valid, unless the assumption is also. In chapter five above I provided evidence with respect to the subjective expected utility maximisation hypothesis of two types: psychological evidence with respect to actual behaviour under uncertainty, and consideration of the possibility and cognitive recognition of probability information. Reasons were advanced as to why information might not be sufficiently good for the purposes of selection.

6.6 CONSTRAINTS ON NON-MAXIMISING BEHAVIOUR: THE EXTENT OF ENFORCEMENT

In the last section a series of possibilities for digression from profit maximisation were proposed, both internal to the organisation of the firm, and externally with respect to competition from other firms. In this section, I shall consider three enforcement mechanisms and show that, while they do place constraints on firms, limiting the extent of deviation from profit maximisation, they are not tight enough filters to exclude all non-maximising behaviour. I shall in particular appeal to information costs and the nature of preferences discussed in the previous two chapters to defend my argument. The enforcement mechanisms I consider are takeover constraints, bankruptcy constraints, and managerial market constraints. Inter-firm competitive constraints were dealt with above.

(i) Firms, the capital market and takeover constraints.

There are two approaches in the literature to the theory of corporate control: the takeover literature and the managerial market. The former is the traditional constraint and is typically formulated as the limit to non-profit maximising in the Marris growth models [1] , which I shall now discuss.

The simple theory of takeovers considers a world of perfect information and no transactions costs. Any deviation from profit maximisation leads to a fall in the share price (itself equal to the discounted value of the stream of future dividends). Actual and potential

1. See Marris (1964) chapter two. The constraint is in these early models a fixed one of a minimum profit constraint, as Yarrow (1976, p.271) points out.

shareholders know what the correct price of the shares should be, since they know the profit maximising value of the stream of future dividends. Any deviation of actual prices from the profit maximising price will call forth a takeover, re-imposition of profit maximising policies on the firm, resulting in a share price rise which represents the arbitrage profit and hence incentive for intervention. This I shall call the perfect enforcement mechanism; perfect in the sense that it operates instantaneously, and enforces maximum rather than satisfactory profits. Furthermore since every manager knows that it operates, it is self-fulfilling.

A more complex theory of takeovers requires that incomplete information and transactions costs be taken into account. It also requires an analysis of the incentives both for deviation and arbitrage. Let us consider these in turn [1].

(ii) Incentives and maximisation.

The explanation above relies on a distinction between either the goals of the managers and shareholders, or between the extent they pursue them. Since it is not immediately clear why, of the two parties, one should maximise and the other satisfy, I shall concentrate, as in the literature, on cases where objectives differ. This is the case where both sets of people pursue their own utility, but that the intermediary target

1. Though I do not consider here the empirical evidence on takeovers and mergers, the literature does not typically support the enforced maximisation hypothesis. Not only do takeovers and mergers tend to be grouped in periods of oligopolistic disequilibrium in the product market (Singh 1975), but post-takeover and merger profits tend to be disappointing (Meeks 1977). See also the empirical evidence presented by Firth (1979) and Cowling et al (1980).

to that end differs. Managers wish to maximise their salaries, while shareholders wish to maximise profits, and hence dividends. The question is then whether the pursuit of maximal utility by sets of agents in opposition can lead to a non-maximal outcome, and this in turn depends on whom the outcome accrues to. In particular, since the Friedmanite argument considered here depends on maximisation of profits being imposed by the selection mechanism, the assumption of that maximisation cannot be tautologically imposed prior to the selection.

(iii) Transactions costs.

The distinction between sources of utility is possible if some impediment to perfect selection is possible. The first of these is the existence of transaction costs. Transactions costs include costs associated with the administration of share transactions, plus the costs of forming a coalition of shareholders large enough to be effective, plus the costs of changing the management structure after the takeover. Though in practice many of these costs include information costs, for analytical reasons I shall look at these separately in the next section. Following Yarrow (1976), the constraint on managerial deviation from profit maximisation can be written:

$$v^* - v \leq c$$

or:

$$v \geq v^* - c$$

where:

v^* = maximum potential market value of firm's ordinary shares

v = actual potential market value of firm's ordinary shares

c = costs of takeover

The condition is therefore a standard optimality one, stating that deviations from profit maximisation by managers are possible without takeover up to, but not beyond the point where the costs become greater than the benefits in terms of share value. In Yarrow's formulation these costs depend on the size distribution of shareholdings and the parameters of the enforcement cost function. The general problem for the wealth maximising manager can then be set up as [1]:

maximise $u(x)$

s.t. $v(x, y) \geq v^*(y) - c$

where:

x = vector of utility yielding decision variables

y = any parameter affecting the market value of the firm's equity.

The first order conditions for the solution to this problem are:

$$\frac{\partial u}{\partial x_i} + \lambda \frac{\partial v}{\partial x_i} = 0 \quad \forall i$$

$$v - v^* + c = 0$$

The outcome then depends on costs of enforcement of takeovers and on

1. The constraint is typically in the literature (Yarrow p.271) written as $v \geq b$, where b = a positive constant. See Marris (1964) and in particular Solow (1971).

the extent to which the interests of managers and shareholders vary, i.e. if shareholders desire profits, the extent to which components of $u(x)$ for managers do not depend upon profits. To the extent that they diverge, the selection filter deviates from profit maximisation by the degree of transactions costs. Takeovers have a disciplinary effect on the actions of managers (defining a minimum profit level below which takeover will result), but it is insufficient to generate the Friedman hypothesis. The takeover mechanism with transactions costs, but without information costs, is an imperfect selector. Hence the Friedman argument fails.

Two questions need then to be resolved: the extent that $u(x)$ is independent of profits, and the degree of the transactions costs. One argument which suggests that $u(x)$ does in fact depend upon profits, relates to the Penrose effect (Penrose 1959) and has been developed by Slater (1980). This argument centers on the cost of growing at a rate in excess of that suggested by profit maximisation, assuming that $u(x) = u(y)$, where y = net income of managers, and that $u(y) = f(g)$, where g = the growth rate of the asset value of the firm. Since growth implies that managers must be recruited and trained, and assuming firm-specific skills and information are required, then increasing the growth rate of the firm above the profit maximising rate implies that current costs are increased. To the extent that the pricing decision depends on costs (either on the marginal rate, or by some mark-up), the current price is increased, thereby given the paradoxical result that output and market share are reduced in the short run. This difficulty may be compounded if economies of scale exist, since the decrease in output raises costs, and hence prices. The argument is therefore that the pursuit of growth at the expense of profits may be self-defeating, implying that the optimal growth maximising path is the

profit maximising one. However the conditions for this result to hold strictly are that the costs of growth must be greater than or equal to the benefits in terms of $u(y)$. Furthermore the benefits must be modelled according to whether they are short or long run [1]. That in turn depends on the discount rate with respect to $u(y)$. To the extent that the costs lead to long run gains to managers, they may be treated separately from current costs, and hence be independent of the pricing decision.

A further difficulty, other than the extent to which $u(y)$ may depend on profits, with the simple takeover constraint discussed above is the implicit assumption about the availability of alternative managers for the implementation of the takeover. It has recently been argued that the market for managers is an efficient one, thus producing managers with an interest in maximising profits. Since this implies that the ownership/control divergence of interest may not exist, I shall deal with this in a separate section below.

(iv) Information costs.

The next difficulty for the perfect selector takeover mechanism is the most important. Information is imperfect. Shareholders know only the actual share price of the firm (v) and not (v^*). v^* is a matter of conjecture and estimation: it involves a counterfactual - what would the firm be worth if it pursued the hypothetical best alternative policy to its present one? There exists a large number of potential strategies, each countered by rivals responses, and each involving the shareholders in information gathering. Standard search theory, about which much was said

1. See above on the short run bias of selection mechanisms, p.281f and chapter two.

in chapter five (particularly section 5.6(ii)) suggests that shareholders will only gather information up to the point at which the benefits exceed the costs. Costs of information allow managers to diverge from profit maximisation policies free of the fear of takeover as long as the above condition is met. That is, we can include information costs as part of (c) in the constraint:

$$v^* - v \leq c$$

However this formulation is not satisfactory: the rationale of the argument is that v^* is unknown. Since costs of information gathering are involved, this constraint can be rewritten as:

$$E(v^*) - v \leq E(c)$$

where:

$E(v^*)$ = expected maximum potential market value

$E(c)$ = expected costs of takeover.

The divergence from profit maximisation now depends on the beliefs of managers and shareholders. The question to be addressed is whether this problem can be solved in at least an ex ante maximising way. There is one suggested solution which meets the perfect selector argument where information is costly. It is that $E(v^*)$ and $E(c)$ are formed following rational expectations methods. The discussion in chapter five suggests that there is no reason to suppose that $E(v^*) \neq v^*$ or that $E(c) \neq c$. I also pointed out in that chapter that the optimising search procedure of searching up to the point where the marginal costs of that search are equal to the marginal benefits is subject to an infinite regress, the outcome of

which is a satisficing procedure.

(v) The free-rider problem.

In a recent paper, Grossman and Hart (1980) argued that the incentive to takeover was subject to an inefficiency due to existing shareholders ability to free-rider on the potential raider. In the Yarrow (1976) model of the takeover discussed above, one of the costs of the takeover is the formation of a coalition just large enough to execute the takeover. The Grossman and Hart paper examines the problem from the point of view of the shareholder owning shares in the company where $v^* > v$ and from whom the raider seeks to purchase shares. Grossman and Hart point out that, ceteris paribus, an offer of v' where $v^* > v' > v$ is typically assumed to be accepted. However since the existing shareholder attaches a positive probability to the likelihood of the takeover, he or she expects that after the takeover the price will rise to v^* . Hence $E(v) \rightarrow v^*$. Furthermore the raider, and not the existing shareholder, bears most of the cost (c) of the takeover. Hence our shareholder, expecting the price to rise to v^* will not accept v' ; rather he or she will free-ride on the raider bearing the takeover costs, and reap the rewards of v^* .

Now with incomplete information, the probability of a purchase offer representing either a takeover bid at all, or even a successful bid, depends on the number of shares held; the size of the coalition. Therefore as the number of shares held by the raider rises, the expectation of v^* rises; hence the price demanded in order for a sale to take place rises. Hence $v - v^*$ decreases as the size of the raider's holding rises. Hence the effectiveness of the takeover selection mechanism has been reduced. The constraint may now be written:

$$v^* - v < c_1 + c_2 \text{ (search)} + c_3 \text{ (shareholding)}$$

It would seem that Friedman's hypothesis is even further from the truth: the selection mechanism is further weakened by this market efficiency. However, Yarrow (1985) has claimed that this problem does not arise in the UK at least where specific institutional arrangements exist to overcome it. But since institutional mechanisms involve set-up and administrative costs, and since share prices rise around takeover bids, the outcome is unlikely to be perfect selection.

(vi) Bankruptcy and Risk Aversion.

In a competitive environment with perfectly elastic supply and constant returns to scale, deviations from profit-maximising strategies should in the long run lead to bankruptcy. Consumers switch instantly if price rises above that of the competitors, so that cost differences result in losses if only normal profits are being attained.

However in oligopolistic and monopoly competition, where supernormal profits are possible, deviations from profit maximisation do not necessarily lead to bankruptcy provided profit remains positive. Hence the bankruptcy constraint, referred to by Friedman, does not act as a perfect selector under oligopoly, which happens to be the dominant market form [1].

The impact of the bankruptcy constraint depends in part on the degree to which managers perceive it. Typically non-profit maximising theories of

1. See Alchian (1950).

the firm include a 'security' variable in the managers utility function. Now the greater the degree of managerial risk aversion, the closer to profit maximisation will be the policies they pursue [1]. Yet there is a paradox here, for the common pursuit of risk aversion, while it will reduce the importance of non-profit motives in the utility function, itself militates against profits. For risk averse behaviour also reduces the extent to which some potentially possible (and more risky) projects are pursued. So while risk aversion tends to encourage profit rather than growth or sales maximisation, it also tends to reduce behaviour away from maximal profits.

1. Yarrow (1973).

6.7 SELECTION AND THE MANAGERIAL MARKET

The existence of imperfections in the takeover mechanism and in information costs impedes the perfection of the selection mechanism where managers deviate from profit maximisation because their sources of utility differ from those of owners. There is however in the literature one major challenge which remains an obstacle to establishing my conclusion that maximisation of profits is not enforced on firms by competitive selection. In an important article in 1976, Jensen & Meckling shifted attention from the traditional concern with the separation of ownership and control directly to the efficiency or otherwise of competition in the managerial market, and the incentives associated with principles and agents within firms. That study was premised on the principal-agent literature, and indirectly led to the defense of the enforced maximisation of profits hypothesis by appeal to an efficient managerial market. That defense focused on 'managerial competition' between rival groups of managers for control of corporate assets. This competition acts to eliminate 'y' arbitrage potential divergences from wealth owning stockholders' goals. As Jensen & Ruback (1983, p.44) put it:

"Competition from alternative managerial teams in the market for corporate control serves as a source of external control on the internal control system of the corporation".

An efficient managerial market is one in which the rent from corporate control is reduced to the normal profit rate, which is equivalent to the pursuit of profit maximising objectives.

The issue which Jensen and Meckling raise, and which has been

developed in particular by Fama (1980) [1], turns on the extent to which the managerial market approximates a perfect one. The underlying assumptions about information, the 'thickness' of the market, about arbitrage and its costs, are matters of dispute. Nevertheless, without here delving deeply into the extensive literature on the subject, it may be concluded that the managerial market is a relatively specialised, thin market dominated by firm-specific skills, varying high levels of human capital, and team production. Performance in one firm is not necessarily a good measure of performance in another, even if the extremely difficult methods of performance evaluation in the existing firm could be easily ascertained. The incentives would, work against long-term maximisation, since managers typically remain with firms for short run periods. Hence the managerial effect of a manager may only become apparant some (often considerable) time after he or she has left. Finally managerial work is typically work within a team; each team has team-specific characteristics which have to be learned. There are therefore few if any readily available substitutes.

1. For a survey of recent developments see Jensen & Ruback (1983)

6.8 CONCLUSION

In the final domain of economic explanation to which the evolutionary argument for enforced maximisation has been applied, there are a series of difficulties which relate to the theory of ^hthe firm. Some of these, such as the prevalence of imperfect information, cause problems for precisely the same reasons as in our discussion of individual behaviour, and particularly of beliefs. Others arise because of the way the analogy is used in firms, and because of the problems of coordinating actions between members of the firm.

In this chapter, I first considered the ambivalence in the use of analogous arguments in general for firm behaviour in contrast to reductionist arguments for individuals. I then advanced two areas where the possibility of non-maximising behaviour could arise; because of internal problems of creating unified objectives as between managers on the one hand, and then because of different sources of utility between managers and shareholders on the other, and external reasons associated with the nature of competition. These possibilities were proposed and discussed as plausible and feasible.

Having given reasons why the incentives might arise, I then considered constraints which have been proposed as selection mechanisms to eliminate non profit maximising behaviour. While each plausibly could limit the extent of deviation, I argued that none could act as perfect selectors. Each made the attainment of some minimum level of profit desirable; none imposed a maximising constraint.

Finally the argument that the separation of ownership and control was

irrelevant because the market in managers was 'efficient' was examined, and it was pointed out that there are characteristics of that market which make it highly implausible that it could itself be a perfect selector.

CHAPTER SEVEN: CONCLUSION

This thesis has shown why the theory of enforced maximisation is defective. In order to demonstrate this I have had to set up a series of methodological criteria by which to decide between this theory and possible alternatives.

The theory of utility maximisation can be constructed in such a way that apparently contradictory evidence can be reinterpreted within its framework. The consequence of this is that utility maximisation is to be seen not as an empirical claim but rather as a paradigm of explanation. To decide whether one explanation is better than another, I have stressed the importance of causality generally and the role of reasons as causes specifically.

The feasibility criterion requires that explanation incorporate the reasons why people act in the way that they do. Two aspects of people's reasoning include their preferences and their beliefs. The utility maximisation theory is supported by assumptions about these; primarily well-ordered (transitive and complete) preferences constant over time (and whose content is exogenous to economic behaviour) on the one hand, and beliefs (which are represented by probabilities) on the other. The theory of enforced maximisation stresses the effect of survival and competition on these reasons - claiming that constant self-interested preferences (defended by Becker), and rational expectations beliefs (defended by Muth), will be selected, since deviations from them are likely to incur adverse selection.

In this thesis I have shown that neither of these two claims about the reasons for action can be sustained. I have presented both methodological and empirical grounds for disputation.

In the last chapter I argued that the case of the theory of enforced maximisation at the firm level may lead to conflict and inconsistency with its use at the individual level; that the selection incentives on individuals might not favour profit maximisation. In particular neither external inter-firm competition or capital market constraints on the one hand, nor internal managerial competition on the other, are sufficient to guarantee the maximisation of profits.

The thesis not only shows that maximisation is not necessarily enforced by competition, but also brings out the diversity of ways in which evolutionary theory has been used in economics. If evolutionary theory has a role in economics, then it is very important to define how it is being used (whether by analogy or reduction), and what evolution itself can achieve. I have argued that a Darwinian caution, discussed in my introductory chapter, should be taken seriously. If evolutionary theory is used as a reductionist argument, then it requires a supplementary theory as to how reasons (preferences and beliefs) are selected. It is distinctly possible that altruism and non-rational expectations, and even the non-probability formulation of uncertainty, may provide a better explanation of what we actually do.

It follows from my argument that an alternative paradigm of explanation might yield a better explanatory framework for examining economic behaviour. I have suggested that preferences should be examined

within the framework of endogeneous theories of their formation, and that such theories are likely to be quite complex. I have suggested that behaviour consistent with non-utility directed goals occurs, and in particular that people act altruistically regardless of the consequences to themselves in at least some situations. Even broadly conceived self-interest is in fact a narrow explanatory framework. Preferences may alternatively be endogenous and not necessarily self-interested in the broad sense inclusive of reciprocal altruism. I have also suggested that the assumption of consistency is open to dispute, and I have challenged the degree of rationality typically imputed to 'economic man'. The possibility of a much richer theory of preferences invites a different perspective on such policy issues as advertising, human capital theory, and demand revelation.

If a richer theory of preferences is called for outside the utility maximisation framework, the alternative framework also calls for a different attitude towards uncertainty. The relevance of non-probabilistic methods, and the fact that selection does not necessarily enforce particular belief-formation methods or their consistency, call for a closer investigation of the rules of thumb, inertia and less directly predictable economic behaviour. These cases are perhaps less readily captured in the reinterpretations of the maximising paradigm. Furthermore those theorists who have stressed the existence of "fundamental uncertainty" have typically derived very different policy rationales and conclusions from those in the rational expectations camp, as we saw in chapter three above.

The idea that beliefs may not always be described as probabilistic, and that preferences may not be stable or constant does not imply that one

is forced into a radical subjectivism which has characterised the Austrian approach of von Mises, Kirzner and Shackle. It does not imply that preferences, beliefs and knowledge are inherently indeterminate and always unpredictable. The implication of our thesis is that one extreme view, that of enforced maximisation, is unfounded. It does not follow that the other extreme view is therefore confirmed.

The price of surrendering the utility maximisation framework is frequently held to be loss of predictability. It is argued that the maximisation paradigm allows determinate predictions to be made, while theories of satisficing behaviour, in the face of complex plural preferences and fundamental uncertainty, do not. It is then claimed that predictions, however inaccurate, are always to be preferred to their absence. To reject one theory it is claimed, the other must yield 'better' predictions.

This argument is not convincing, and for a number of reasons. First, I have pointed out that utility maximisation does not of itself predict anything, without the introduction of preference and probability information about what these actually are. Second, I have stressed that testing empirical predictions does not decide in itself whether one theory is a better explanation than another. Third, the observations of the behaviour itself in question are not disputed. There is little dispute about consumers' and producers' actions and choices, whether they be particular purchases or price and output decisions. Two different theories can predict the same behaviour, and indeed as we have seen, those examples typically held to count against maximising behaviour can be reinterpreted within that paradigm. The dispute is about why they do what they do.

Fourth, I have shown that utility and profit maximisation are typically defended against counter-evidence by reference either to different levels of the objects of choice or to additional constraints. Thus the claim to predictive superiority for the utility maximisation model is somewhat hollow.

I want to briefly raise in this concluding chapter a normative issue related to the enforced maximisation hypothesis, as to whether competition would, even if could enforce maximisation, be therefore desirable. The word 'enforce' implies that individuals may well have chosen otherwise in the absence of the selection mechanism. If (1) they might have chosen otherwise, and (2) welfare depends on the satisfaction of preferences in the form of choice relations, then it may be questioned as to why the enforced result must be seen as desirable. Why should credit be taken for enforced preferences [1]?

The intuition behind the query is that many people feel that they would prefer the quiet life to the 'rat race' of competition, yet because others prefer the rat race (they maximise profits and what appears as 'utility' at all costs) they are therefore forced to compete. J.S.Mill expressed this doubt as follows (1848; quoted in Hicks (1983, pp.68-9)):

"I confess I am not charmed with the ideal of life held by those who think that the normal state of human beings is that of struggling to get on; that the trampling, crushing, elbowing and treading on each others' heels, which form the existing type of social life, are the

1. Huxley (1894) pp.80-1, put it as follows. "'Fittest' has a connotation of 'best'; and about 'best' there hangs a moral flavour."

most desirable lot of human kind, or anything but the disagreeable symptoms of one of the phases of industrial progress".

Competitions have losers as well as winners, and the gains in efficiency from competition (whatever these may be), must be set against the welfare loss of the losers. This line may be pursued to consider ways in which competition might be limited to prevent the most undesirable features of its operation. These include the legal and political framework regulating competition, and that of moral custom and trust. It is important to realise that the naive view of economic competition is unfounded, in the sense that it could not operate without the required existence and enforcement of property rights and contractual obligations, and these require a pre-existing legal framework. They also require behavioural norms. As the discussion above concerning short and long run maximisation showed, the development of trust and honesty in contractual arrangements and implicit cooperation are rather crucial for the longer-term levels of profit.

It could therefore well be rather fortunate that competition does not enforce individualistic maximisation. A world inhabited by rationalistic, self-interested and consistent individuals who are forced to maximise utility and profits may be far from the best of all possible worlds to live in.

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