Economics Beyond the Neoclassical Synthesis

Rediscovering Keynes's Enterprise

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> It is as though the fall of the apple to the ground depended on the apple's motives, on whether it is worthwhile falling to the ground, and whether the ground wanted the apple to fall, and on mistaken calculations on the part of the apple as to how far it was from the centre of the earth.
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> (John Maynard Keynes 1971-1989, XIV, p. 300)

In his book *After Virtue*, Alasdair MacIntyre (1981) notes the indecisive nature of moral disputes in modern society, and postulates that a radical breakdown has taken place in our moral thought and language. We have retained habits of thought and patterns of argument from traditional ethics, but have lost the substantive basis for many of those habits. For example, in the Aristotelian tradition which prevailed prior to the modern era, moral judgements were based on a shared conception of the *telos* or end of man, and it could then be a matter of fact whether a given course of action would lead to achievement of the *telos*. But, MacIntyre argues, with this conception lost, with the project to provide a rational justification for morality having failed and with emotivism the prevailing consensus, no shared basis remains on which to determine the truth and falsity of a moral judgement. Yet the language and the disputes about the truth or falsity of moral judgements remain.

MacIntyre also argues that in this breakdown of the moral realm certain types of 'character' become common. These characters embody different perceptions, even different traditions, of moral life, but in an emotivist world there is no contact between them. Two main types are dominant. One is the aesthete, for whom the fulfilment of oneself through sensual enjoyment and artistic experience is the only and ultimate goal, and for whom value is a matter of private and unarguable perception. The other is the manager, for whom ends are taken as given and who claims moral authority through his effectiveness in achieving those ends, and through the stability and prosperity which he generates. Indeed, MacIntyre claims, in spite of their lack of contact 'the two characters may on occasion be found in one and the same person who partitions his life between them' (1981, p. 27).

In the second volume of his authoritative biography of John Maynard Keynes - *The Economist as Saviour 1920-37* - Robert Skidelsky uses MacIntyre's analysis to define his view of Keynes. Keynes is 'a leading, possibly the leading, twentieth-century example of this type of 'partitioned' character, the finest flower of an autumnal civilization' (1992, p. xviii). The cleavage in Keynes's life was between the sensual and artistic world of Bloomsbury and his managerial role as economic statesman and 'saviour' of capitalism. *The Economist as Saviour 1920-37* eloquently catalogues these two worlds. For Skidelsky, then, Keynes's life was partitioned into his Bloomsbury activities, driven by the religion of friendship and beauty he learnt from G.E. Moore and the urge for unfettered self-expression, and his intellectual and managerial activities, driven by the vestiges of Edwardian duty. Thus his 'character' was a set of strategems, and he presented a series of masks to his contemporaries. But his sense of duty prevailed in the end, 'because the world needed to be saved from its folly'. However, in this Keynes held to a tradition which was a fragment of a passing era. He was 'the last great economist to hold economics in some sort of relation to the 'good life'' (p. xxiii). In this as in

other respects, Keynes was echoing a vanishing world rather than being a harbinger of the new. There are:

> moral resonances in Keynes's technical arguments which can be heard by those willing to listen. They are not part of the logic of the arguments themselves. Economics was already too far removed from being a moral science for it to carry moral arguments. It was another fragment of a vanishing whole, soon to disappear into the black hole of mathematics. (p. xxv)

My first theme in this article is that developments within the 'black hole of mathematics' have not been what was anticipated, at least by those who promoted economics as a scientific, value-free discipline on the model of physics. To make sense of the results of that work over the past twenty years - the incredible richness of the models now being produced, the wide diversity of their policy implications and the evident failings of the welfare foundations of modern economics - requires an understanding of the enterprise of economics quite different from that of the pioneers of mathematical economics. My second theme is that the understanding of the enterprise of economics which Keynes evolved and practised is highly relevant to this new task of making sense of economics beyond the neoclassical synthesis. Keynes's conception of economics as a moral science, in which a wide variety of models are used as tools to guide practical judgement and policy initiatives to achieve morally desirable goals, may have disappeared into the black hole, but it is reappearing with new force out the other side.

The article is divided into five sections. In Section 1, I explore aspects of the ironic fact that, just as the Keynesian revolution was being created, the foundations of neoclassical general equilibrium theory were also being laid. Section 2 details the development of the neoclassical synthesis up to the 1950s, describing the nature of that synthesis and its approach to economics. In Section 3 Keynes's view of the enterprise of economics is discussed, and the differences between it and that embodied in the neoclassical synthesis are explored. In Section 4 the central argument about the development of neoclassical economics over the past twenty years is laid out, with examples drawn from the theory of growth, from the treatment of expectations and of oligopoly theory and from the welfare foundations of economic theory. In the final section it is argued that these results require a quite different conception of the nature of economics from that originally embodied in the neoclassical enterprise, and that here Keynes's views are highly relevant.

1. An Irony of History

In 1874 in France Leon Walras published the first part of *Elements of Pure Economics*, with the second part appearing three years later, and in 1890 Alfred Marshall's *Principles of Economics* was published in England. While different in many ways, these two works were central to the marginalist revolution in economics. In essence, marginal analysis involved applying the theory that the optimum value of an economic variable is that value which maximises an appropriate choice variable, such as utility or output. Thus it involved the fruitful application of the techniques of the differential calculus, and was quickly applied to the theory of value, of production and of exchange, and more generally throughout theoretical economics.

Walras's approach was uncompromisingly mathematical and focused on general equilibrium, requiring a degree of mathematical sophistication not common among economists at that time. For this and other reasons, his work did not have great immediate impact, and indeed an English translation of the *Elements* was not available until 1954. By contrast, Marshall's analysis was much more accessible, and was presented as an elaboration and extension of the tradition flowing from Adam Smith and Ricardo. His emphasis on partial rather than general equilibrium analysis also provided tools which at that time could be more

readily applied by economists to particular problems. Thus Marshall's work became the principal effective vehicle of the marginalist revolution.

The rise of marginal theory also brought with it the renewal of a broad if not universal consensus about the aims and methodology of economic science. As usual, Walras's views were more severe than others. He saw pure economics, as distinguished from applied or social economics, as a value-free 'physico-mathematical' science whose primary concern was the determination of prices in a general equilibrium set of markets, for both exchange and production economies. By contrast, a main source of the renewed methodological consensus was the work of John Neville Keynes, who was closely associated with Marshall. Indeed J. N. Keynes's *Scope and Method of Political Economy*, which was quickly accepted as the definitive statement on the methodological issues, was published in early 1891, only a few months after Marshall's *Principles*, and the two authors had exchanged and commented on drafts and proofs of the volumes (Deane 1983).

J. N. Keynes distinguished positive economic science, which is a body of systematised knowledge concerned with what is, from normative or regulative economics, which is concerned with what ought to be rather than what is actual, and also from the practical art of political economy. Positive economic science, 'the whole province of which is to establish economic laws or uniformities' (Keynes 1930, p. 53), was the central concern of professional economists. It is a quantitative science, heavily dependent on mathematical and deductive methods for model construction, but also relying on statistical and inductive methods, particularly in the area of checking theories against historical fact. Thus he found a place for both of the then competing deductivist and inductivist schools, and a role for the systematic study of normative issues while preserving the objective, scientific status of the central, positive discipline.

As the world entered the Great Depression of the 1930s neither the general equilibrium aspirations nor the mathematical goals of Walras were high on the agenda of economists. The over-riding issue was to understand, and to prescribe policies to address, the massive cyclical fluctuations which were racking the world economy. The continuing debate over the theory of the economy as a self-correcting, free market mechanism was of course conducted in this arena, between John Maynard Keynes, Pigou and others. Outside these issues, Marshallian partial equilibrium analysis largely prevailed and literary rather than mathematical methods of expression were widely favoured by economists. In the event Keynes's victory in the macroeconomic arena was decisive after the publication of the *General Theory* in 1936, leading to the widespread and successful adoption of demand management policies in most developed countries for three decades after the Second World War.

Nevertheless, given the extraordinary achievements of mathematics and science in the early decades of the twentieth century, and particularly of physics, the impetus behind the Walrasian program of constructing a general economic system with mathematical standards of rigour and proof on the model of physics could not be forever denied. One irony of history is that, just as Keynes was establishing a central role for intervention in the management of the macroeconomy, the basis was also being laid for the elaboration of the purely competitive model in a formal general equilibrium system. This achievement, together with the mathematical tools and the modelling applications which it spawned, would prove to be the dominant intellectual force in economics in the second half of the twentieth century. Indeed, the strange alliance between Keynesian and neoclassical theory which Stiglitz (1991) has termed the *neoclassical synthesis* - the view that the economy is a self-regulating free market system over the longer term but is subject to market failures requiring corrective action over the cycle - has been the central theme in both policy advice and in the textbooks and teaching of economics over that time. The development of this synthesis is outlined below.

2. The Emergence of the Neoclassical Synthesis

Competitive General Equilibrium Theory

In 1930 the work of Walras was not widely known in its own right, as noted above, but was known primarily through the filter of Gustav Cassel's *The Theory of Social Economy* (1932). The story of the way in which a group of economists and mathematicians started from Cassel's simplified version of Walras's model and created modern general equilibrium theory by 1954 is an extraordinary one, well told by Weintraub in a paper on which I draw heavily (Weintraub 1983; see also Arrow and Hahn 1971). The key players were Wald, von Neuman, McKenzie, Arrow and Debreu; the key institutions were Menger's Mathematical Colloquium in Vienna in the 1930s and the Cowles Commission in Colorado Springs and later in Chicago. But as usual progress arose from the conjunction of many influences and events.

Cassell's work provided an approach to the problem of the determination of prices in a general system with interrelated supply and demand in product and factor markets. It involved a substantial simplification of the Walrasian model in that it assumed constant input-output coefficients in production and inelastic factor supplies, and neglected intermediate goods. The central problems of interest in Menger's Colloquium in Vienna were to refine this system in its mathematical and economic assumptions and to establish the existence and uniqueness of an equilibrium. Such a system is of little value if it cannot be shown that an equilibrium exists, and so this has to be the central question. Most authors, including Walras himself and later Samuelson (1947), had assumed that this issue could be addressed by counting equations and unknowns, and ensuring that the number of independent equations and the number of unknowns were equal. It was widely realised by the mathematicians in the Colloquium that this approach was not correct, and hence the emphasis on whether, and on what conditions, the existence of an equilibrium could be established.

The principal direct results from this period came in a series of four papers between 1934 and 1936 by Abraham Wald (for references see Weintraub 1983). In these papers Wald established, through arguments of forbidding mathematical complexity, the existence of an equilibrium for the Cassell system and for a pure exchange economy. He also explored the conditions for the uniqueness of these equilibria, and introduced alternative sufficient conditions for uniqueness, that the weak axiom of revealed preference holds for the market demand functions and that all commodities are gross substitutes. Both of these assumptions were to remain important themes in the subsequent literature. But before Wald's work could be taken further in a way which would have direct economic significance, two other conditions were necessary - the emergence of new and more accessible mathematical techniques and a renewal of interest among economists in general equilibrium analysis. These conditions were largely met through the work of John von Neumann and John Hicks.

Von Neumann was one of the greatest mathematical figures of this century, and without doubt the mathematician who has had the greatest influence on economics. In 1928 he published in German a paper which initiated the study of game theory, appropriately entitled 'The Theory of Games' (translated in Tucker and Luce 1959). This paper developed tools in the context of game theory which were to be of fundamental importance in general equilibrium theory, particularly the use of a generalisation of Brouwer's fixed point theorem to obtain saddle-point theorems. In a paper first presented in 1932 and finally published in 1937 von Neumann himself applied these results to general equilibrium problems, with his famous model of balanced economic growth. Weintraub has described this paper as 'the single most important article in mathematical economics' (Weintraub 1983, p. 13). It contained the first use in economics of key techniques such as duality arguments, fixed point techniques for existence proofs, convexity arguments and the activity analysis or linear programming model of production. Thus von Neumann's work, with its full expression in his 1944 book with Oscar Morgenstern *Theory of Games and Economic Behaviour* and with several important

extensions, provided the techniques required for the flowering of general equilibrium theory. These extensions included the development of the activity analysis or linear programming model of production by Koopmans and others (Koopmans 1951), the subsequent simplification of von Neumann's use of the fixed point theorem by Kakutani (1941) and the introduction by Nash of the now standard definition of equilibrium in n-person games (1950).

The economic impetus was largely provided by Hicks' book *Value and Capital*, which was published in 1939. One of this book's main aims was to understand why Keynes's conclusions on important policy issues differed so markedly from those of earlier economists, and it served to link the concerns of the Keynesian macroeconomic literature to general equilibrium theory. This was especially so given that another aim of the book was to reconsider the value theory of Pareto and Walras, and to apply such theory to dynamic problems of capital. In *Value and Capital* Hicks developed general equilibrium theory in terms of the standard neoclassical theory of the household and of the firm, and hence linked it directly to contemporary language and concerns. He also provided an initial analysis of existence and stability issues, although the question of the existence of equilibrium was not recognised as a serious technical issue. The analysis was outlined in literary terms, although a full mathematical specification of the model was provided in an Appendix. In short, the book served to bring together a number of varied perspectives - neoclassical and Keynesian, mathematical and literary, partial and general equilibrium - and to show how many issues of common interest could be usefully explored in a general equilibrium framework.

As in many disciplines and in many places, the decade after the Second World War was highly productive in mathematical economics, particularly in the United States, where local activity was very much enhanced by the extraordinary influx of talent from Europe in the 1930's and the 1940's. One example of this was the independent appearance in August 1950 of two papers, one by Gerard Debreu, a French mathematical economist then at the Cowles Commission, and the other by Kenneth Arrow, formerly of the Cowles Commission but then at Stanford (Debreu 1951; Arrow 1951). Both of these papers presented models of the general equilibrium of a competitive economy, based on the theory of convex sets and the approach to production developed by Koopmans and others. They both also established that the competitive equilibria of these systems are Pareto efficient, i.e. such that the position of no agent can be improved without worsening the position of some other agent, and that all Pareto efficient allocations can be achieved by some competitive equilibrium sets of prices. In other words, these papers established the basic welfare properties of competitive equilibria. The most important issue that remained unanswered was whether such equilibria actually existed.

Again the definitive work emerged simultaneously but independently. On successive days at the Chicago meetings of the Econometric Society in December 1952 papers were presented by Arrow and Debreu and by Lionel McKenzie, demonstrating under somewhat different conditions the existence of a competitive equilibrium (Arrow and Debreu 1954; McKenzie 1954). Arrow and Debreu modelled the competitive economy as a multi-person game, using a definition of equilibrium more general than that of Nash, and in this context proved existence by analysis of the properties of the convex sets, using the Kakutani fixed point theorem. The McKenzie paper approached the existence question through an international trade model which, by treating countries as firms and neglecting intermediate goods, is reduced to a general equilibrium system. Again, the Kakutani theorem plays a critical role in the proof. The existence theorems of these papers were much more general than those achieved by Wald over a decade before, particularly in that they do not assume either fixed proportions in production or the weak axiom of revealed preference in respect of consumers. Uniqueness was not addressed by Arrow-Debreu, but McKenzie proved uniqueness, but only by relying on that very axiom.

Thus the seminal work on specifying the general equilibrium system, on proving the existence of equilibrium in general conditions and in determining the welfare properties of competitive equilibria was completed by 1954. The results of this work, together with the extension to uncertainty, were elegantly summarised in Debreu's 1959 classic *The Theory of Value*. Of course many issues remained to be explored, particularly the uniqueness and stability of equilibrium. The position by 1970 was summed up in another classic, Arrow and Hahn's *General Competitive Analysis* (1971).

The Neoclassical Growth Model

The Arrow-Debreu model of general equilibrium is the backbone of, but not the only component of, what I am following Stiglitz in calling the neoclassical synthesis. The second element is the theory of growth. Through their independent but contemporaneous contributions in 1956, Solow and Swan instigated a major new phase in growth theory, creating the foundations of what is often referred to as the basic neoclassical theory of growth (Solow 1956; Swan 1956). The motivation was to show how, in contrast to the findings of Harrod and Domar (Harrod 1939, 1948; Domar 1946, 1947), steady state economic growth was possible in a pure competitive economy. This issue was more consistent with the optimistic tenor of the postwar period than the Harrod-Domar image of the economy on the knife edge between unsustainable growth and depression, natural though that image was in the wake of the volatility of the 1920s and the 1930s.

The key economic assumptions of the Solow-Swan model are those of competitive equilibrium. In particular this means that constant or decreasing returns prevail and that capital and labour markets continuously clear, with the wage rate equal to the marginal product of labour, with savings equal to investment and with the interest rate equal to the marginal product of capital. It is also assumed that both population growth and technological change are exogenous and constant, each taking place at a rate which is either zero or positive, and that a constant proportion of income is saved at all times. This last assumption - of a constant and exogenous rate of saving - sits oddly with the general equilibrium context of the model, and was the subject of considerable work in the 1960s, aiming to model the savings choice as one involving infinite horizon intertemporal optimisation on the part of a representative consumer (Cass 1965; Koopmans 1965). This work became a feature of most subsequent neoclassical growth models, but did not change the basic properties of the Solow-Swan model.

The main features of the Solow/Swan model are well known. First, if technology and labour supply are fixed, the steady state growth rate is zero. That is, there is no endogenous growth in the model, growth being driven in the steady state only by change in the exogenous variables. Secondly, if one of technology and population show positive growth then the steady state growth rate of the economy is proportional to the growth rate in that variable; if both rates are positive the economy's growth rate is a weighted average of the two. Thirdly, the steady state growth rate does not depend on either the level of savings or of investment in the economy. An economy which continuously saves and invests 20% of national income will have a higher level of output than one investing 5%, but it will not have a higher steady state growth rate. Thus the broad economic message of the Solow/Swan model is that steady growth is possible in a purely competitive world, provided that there is growth in either population or technology, or both. Solow (1957) further developed this model in a way which provided the foundations for the subsequent growth accounting industry.

Keynesian Macroeconomics and the Neoclassical Synthesis

The third element of the neoclassical synthesis was a version at least of Keynesian economics itself. For the particular approach, pioneered by Samuelson and widely adopted by

the economics profession and by the textbooks (following especially the remarkable success of Samuelson's *Economics*), was that while the neoclassical model prevailed generally through the economy, wage rigidities and other factors generate market failures in the macro economy. Thus while problems to do with firms and consumers, growth and trade, and so on were analysed using the standard neoclassical apparatus, macroeconomic issues were considered using the IS/LM apparatus and other methods seen as deriving from Keynes. This mixed approach prevailed at least into the 1980s, when increasing attention began to be given to models, such as those based on rational expectations and real business cycle theory, which were seen as providing an approach to macroeconomics consistent with competitive general equilibrium.

Thus for three decades or more a remarkable synthesis prevailed widely within the economics profession. This involved the purely competitive general equilibrium model based on Arrow-Debreu for the static economy at large, the neoclassical growth model with growth in the competitive economy driven by exogenous changes in technology or population for the dynamic economy and Keynesian models and policies for cyclical fluctuations in the macro economy.

Features of the Neoclassical Synthesis

For our purposes two aspects of this synthesis, or at least of its neoclassical core, are particularly relevant. The first is the 'scientific' character of the theory. For this theory was seen by most of its adherents as the single correct description of the capitalist economy, and hence as analogous for those economies with the theories of physics. While the possibility of specific cases of market failure was acknowledged, and the details of the application of the model to individual economies required empirical study, the neoclassical theory provided a single coherent theory with potential universal application. Policy recommendations were to be derived by applying the theory in the particular circumstances in question. Thus the theory gave rise to several generations of competitive general equilibrium econometric models, the objectives of which were to estimate the values of the relevant parameters for particular economies and hence to develop a quantified model which could be used for policy analysis.

The second aspect relates to the value presuppositions of the neoclassical core, for the Arrow-Debreu model is seen as providing reasons why the market optimum can justifiably be pursued without any further consideration of value or welfare issues. At the heart of the model are individual consumers with ordered sets of preferences, assumed to satisfy the technical requirements of the model. One characteristic of equilibrium is that a Pareto optimum is achieved across these sets of preferences, that is that no individual can achieve an improved position without some other individual being worse off. The Second Fundamental Theorem of Welfare Economics then states that any Pareto optimum can be achieved by a competitive equilibrium, so that any desired welfare distribution can be achieved through a market outcome together with an appropriate set of lump sum transfers. The market can be used to achieve any morally desirable outcome - all that is required is the necessary lump sum transfers.

Thus in several ways the neoclassical framework has removed any moral dimension from economic theory and analysis. The basic preference set up is entirely individualistic, and the preferences of individuals are entirely unconstrained. Thus there is no need or room for considerations of 'the good life' - for considerations about some preferences or ways of living being better or more fulfilling than others - or of there being preferences, requirements or values relating to the community as a whole rather than to the individual alone. Armed with the Second Theorem, economists and policy makers may vigorously pursue the free market outcome, confident that those concerned with distributional or moral issues have the tools with which to achieve any distribution of outcomes across individuals. In this way the model

has fitted well with an individualistic approach to social and political issues and with the goal of a 'value-free' social science.

3. The Keynesian Enterprise

One important contribution of the first volume of Skidelsky's biography, which was entitled *John Maynard Keynes: Hopes Betrayed 1883-1920* (1983), was to draw attention to a number of important early philosophical and political manuscripts written by Keynes between 1905 and 1912. These manuscripts, written between the ages of 22 years and 29 years, are unpublished, having been regarded as not sufficiently relevant to his economic writings to be included in the definitive 30 volume edition of his collected works published by Macmillan/CUP for the Royal Economic Society.

In his highly original and thought-provoking book *Keynes's Vision*, Athol Fitzgibbons (1988) has argued that in these early works Keynes developed a philosophical and political position which remained largely unchanged, which underpinned his life's work and activities in many different spheres and which is essential to a proper understanding of his mature work. According to Fitzgibbons, Keynes had a unified vision in two senses: that the diverse aspects of his life, which appeared so disparate to many of his contemporaries, sprung from a common well and that his political and economic views and activities emerged from his underlying ethical position. Here I draw on and in some respects extend Fitzgibbons's work, to outline a view of the economic enterprise according to John Maynard Keynes. I do not claim sufficient expertise on the life and work of Keynes to argue that this is the one and only true view. But I do claim that this view is of considerable interest in helping us to understand the contemporary state of the enterprise of economics.

Ethical Foundations and Political Basis

Keynes's vision, according to Fitzgibbons, is quite consciously a reversion in key respects to pre-modernity. He held that certain central mistakes had been made in fashioning the distinctive intellectual cast of the modern world, and of modern economics, from our older inheritance. In diagnosing those mistakes and shaping his vision, Keynes drew upon and reacted to three main figures - Hume, Moore and Burke.

Keynes saw Hume as the most powerful intellectual force in the creation of the modern world. Three positions of Hume were particularly critical. One is the failure of induction, implying that no knowledge can be obtained by non-deductive means. The second is the gulf between 'is' and 'ought', so that no moral conclusions can be inferred from factual premises. The third is a consequence of these, namely Hume's view that there is no role for reason in either morality or in action. These are the preserve only of the passions and of unreasoning convention. Keynes opposed each of these positions, and launched his public assault with *A Treatise on Probability*, published in 1921 (Keynes 1921), although he earlier wrote about these matters extensively in his unpublished papers.

Keynes's continuing concern was with the rational basis for moral judgement and action, and this was closely connected to judgements of probability. The central argument of the *Treatise* was that, just as we are able to judge that two things are similar, so we can form a rational judgement that a proposition is probable relative to a certain set of evidence. These judgements or intuitions of probability are the foundation of much reasoning, in science as well as in ordinary life, and indeed there should be a logic of probability, parallel to the logic of deduction laid out in Whitehead and Russell's *Principia Mathematica*. Hume's mistake was to treat judgements of probability as not rational simply because they were not deductive. On the contrary, it is rational to rely on judgements of probability in action, indeed we ought to do so.

These rational intuitions of what is probable are parallel to the exercise of understanding in many other areas - in mathematics and science, in the arts and in ethics - and were a continuing point of contact between Keynes and Moore's *Principia Ethica* (Moore 1903). In that work, which had enormous influence on Keynes and his Cambridge contemporaries, Moore distinguished between our intuitions of ultimate goods - truth, love and beauty - and the problem of duty, of determining what one ought to do in action. Moore sought a utilitarian solution to this problem, that we should do whatever would secure the greatest good for the greatest number, but argued that we can never know with sufficient accuracy and surety the consequences of our actions. Thus there can never be a rational determination of duty, and we should follow standard conventions of duty. In terms of practical morality Moore ends up with Hume.

Keynes retained the rational intuitions of ultimate goods - Moore's religion, as he called it - but dispensed with his practical ethics. But he shared Moore's opposition to utilitarianism, on similar grounds that it was not possible to calculate all the future consequences of one's actions. For Keynes, uncertainty about the course of human affairs was pervasive, as was objective chance, i.e. situations in which it is impossible in principle, given human limitations, to predict the future. The utilitarian calculations are just not possible. Thus Keynes was opposed to any utilitarian concept of the *social good* or the *maximisation of utility* as a touchstone for action.

Nevertheless, he believed that he had established, in the *Treatise*, that there could in many situations be rational judgements of probability, and these ought to be utilised in determining the moral basis of action. These judgements should be used, not in calculations of the social good, but in guiding action in complex and difficult situations in the light of fundamental moral values. Thus the foundations of Keynes's ethics were the absolute ideals of truth, love and beauty, with their counterparts of reason, creativity and justice, and the use of rational judgements of probability to determine courses of actions which would make these ideals more effective in human society.

The key point of attraction to Keynes of Thomas Burke was that, in Keynes's view, Burke alone based politics on ethics and absolute values. This means that politics should be devoted to the achievement of ethical ends, not to quasi-political ends such as political equality, the rights of man and the utilitarian social good. Politics is about means not ends. The ends to be served are the ethical ideals, and the dominant political principle is that of expediency, meaning the pursuit of these absolute ideals through whatever means are appropriate from time to time.

Again, Keynes agreed with Burke in opposing the 'Benthamite calculus', the calculations of rational self-interest based on an 'over-valuation of the economic criterion'. Modern ethics, which was the scientific study of rational self-love, was a totally inappropriate basis for politics, or for economics. Keynes saw Marxism as the final corruption of the Benthamite calculus. The ultimate ideals were spiritual not material, and economic and political processes could only find their rationale in the service of these higher ideals. For Keynes, then, correct political action is expedient action, based on the best judgements of actual circumstances, guided by truth, reason and justice and in pursuit of a world where spiritual and not material values prevail.

Economics

The centrepiece of Keynes's mature economics, encapsulated above all in the *General Theory*, was his treatment of uncertainty. By uncertainty Keynes did not mean that which is often discussed under this name in modern economics, where a probability distribution over future states of affairs is known but it is uncertain which state will eventuate. True uncertainty for Keynes is when there is 'no scientific basis on which to form any calculable probability

whatever. We simply do not know.' For Keynes, such uncertainty is pervasive in the modern economy, and it is a central failure of orthodox economic theory to assume a knowledge of the future of a quite different kind from that which we actually possess.

This uncertainty is the main reason for the volatility of investment, and hence of the level of economic activity. For, when faced with an unknowable future, rational economic man tends to fall back on conventions or fads, as had both Hume and Moore in rationalising action in accord with duty. These conventions are not based on reason but on self-deception. Thus they may lead to investment being set for a long period at a level inconsistent with full employment, or with rapid changes in the prevailing wisdom, leading to economic instability. The difficulties in rationally predicting the future may also lead to speculation, i.e. trying to guess better than the crowd how the crowd will behave, rather than to fixed investment for the long term. When the views prevailing in the business community are such that the level of investment is inconsistent with full employment, government intervention by appropriate policies is justified.

In the *General Theory* the focus of this uncertainty is money. Keynes identified the linchpin of the classical theory as the natural rate of interest, the rate which equated savings and investment and hence at which there was full employment. But, Keynes argued, at this point the classical theory is incoherent. There is no such natural rate, to which the actual rate is tending and to which it will return if disturbed. The rate of interest is determined by the supply of and demand for money, and is a transient monetary phenomenon. 'The rate of interest is a highly conventional ... phenomenon. For its actual value is largely governed by the prevailing view as to what its value is expected to be. Any level of interest which is accepted with sufficient conviction as likely to be durable will be durable ...' (p. 203). It may fluctuate for decades at a rate which is too high for full employment.

Keynes's rejection of the underlying natural rate of interest was an instance of his more general opposition to what Fitzgibbons calls 'the celestial science' of economics. He rejected the attempt to determine the underlying causal structure of the economy, the 'Copernican system' of economics based on the analogy with physics and expressible in systems of simultaneous equations. While Keynes attributed this view to Marshall, its contemporary dominance owes much more to Cournot, Walras and the founders of modern neoclassicism, as noted above. Given the swirl of events there are no truly independent variables; economics does not deal at the true causal level, and its variables are fallible and changing indexes; radical uncertainty and objective chance are pervasive. For these and other reasons the celestial science is a delusion, obscuring the exercise of reason in dealing with the complexity of the world.

The Enterprise of Economics

Keynes's mature view of the enterprise of economics is summed up most clearly in his two letters to Harrod in 1938, from which the quotation at the head of this paper is taken (1971-1989, XIV: p. 300). Keynes reiterates his support for empirical studies in economics but is strongly opposed to 'the pseudo-analogy with the physical sciences' (ibid). Empirical and statistical work is important to test the validity of a given model and to suggest new and more fruitful models, but the attempt to fill in the real values of the variable functions, as is done for example in physics and chemistry, is mistaken. 'One has to be constantly on one's guard against treating the material as constant and homogeneous' (ibid) and when particular values are filled in, the model loses its generality and its value as a way of thinking about individual cases.

Thus economics is a way of 'thinking in terms of models joined with the art of choosing models which are relevant to the contemporary world'(ibid). Progress in economics consists almost entirely in a progressive improvement in the choice of models, and 'good

economists are scarce because the gift for using 'vigilant observation' to choose good models, while it does not require a highly specialised intellectual technique, appears to be a very rare one' (ibid). Economics is a moral science and not a natural science, 'that is to say, it employs introspection and judgements of value' (ibid). In the second letter Keynes stresses this again: "I want to emphasise the point about economics being a moral science. I mentioned before that it deals with introspection and with values. I might have added that it deals with motives, expectations, psychological uncertainties" (ibid p. 300). The sentence about the fall of the apple, cited at the head of this paper, then follows.

Thus the key elements of Keynes's view of the enterprise of economics might be summarised as follows:

- the reality with which economics deals is one of great diversity and complexity, which involves important psychological components and which changes over time, and in which radical uncertainty is endemic;
- the ability to develop and handle a wide variety of models is central in the light of this diversity, variability and uncertainty, and pseudo-scientific reliance on a single model must be avoided;
- the essence of good economics is the ability to judge which of a wide variety of available models throws most light on a given practical situation, and
- in making those analytical judgements and generating policy recommendations, rational value judgements and assessments of probability are highly relevant, so that considerations of value cannot be excluded from the economic enterprise.

It is important to note that Keynes's views on the role of value judgements in the work of economists were not merely idle theory. For example, Keynes was involved with the Peace Conference after the First World War, and his reputation was made with *The Economic Consequences of the Peace*, the book in which he expressed his disgust with the settlement forced on Germany (1919). The victorious allies had acted on neither truth nor justice, but out of greed and venality. Rather than pursuing short-term self-interest through injustice and by avoiding the truth, the allies should have based their actions on better expectations, in the belief 'that the prosperity and happiness of one country promotes that of others, that the solidarity of nations is not a fiction, and that nations can still afford to treat other nations as fellow creatures' (p. 170). Given the immoral nature of the settlement 'vengeance, I dare predict, will not limp ... before which the horrors of the late German war will fade into nothing' (p. 170). While we cannot predict the future, present injustice is likely to generate greater future evil. The accuracy of this grim prediction needs no comment.

4. The Subsequent Development of Neoclassical Theory

The Emergence of Diversity

The creation of modern competitive equilibrium theory, described in Section 2, was important work, which set the stage for theory and for policy for decades to come. The tools and techniques developed at that time have proved highly fertile in the construction of a vast diversity of new models within the neoclassical tradition. But that very fertility has come at a price, for the development of a wide range of models testing the implications of variations in the standard assumptions has shown that the central model is not robust in the light of such variations. Increasingly, therefore, it has come to be realised that the major importance of the earlier creative work lies in showing rigorously *the highly restrictive nature* of the assumptions needed to establish the cherished beliefs of much of the economics profession about competitive markets. As Stiglitz puts it:

> Arrow and Debreu's great achievement was not to prove a general result - it is a very special model indeed. But rather it was to find those special and limiting conditions under which the Invisible Hand theorems hold. Their contribution can be seen as a

> negative contribution - as showing how limited Adam Smith's original conjecture was. (Stiglitz 1991, p. 18)

If the standard neoclassical model is a 'special and limiting' one, then the central focus must be on the models describing the central cases of economic relevance. And if there is a wide variety of these the nature of the economic enterprise has to be up for reconsideration.

There are inevitably a wide variety of assumptions underpinning the general equilibrium model of Arrow and Debreu. Six of the main assumptions are as follows:

1. The existence of complete markets in a finite economy (that is a market for every good at every time and place, and for every set of conditions), and assumptions concerning expectations and perfect information.
2. The existence of independent, utility or profit maximising agents.
3. The assumption that firms have no sunk costs, no market power and convex production functions.
4. The assumption that all firms and consumers are price-takers, interacting only through markets.
5. The assumption that technological change is external to the economic system, and determined by factors outside the economy.
6. The assumption that the structure of the economy (e.g. the number and nature of goods and of firms and the preferences of consumers) can be treated as given and fixed, and hence as independent of developments within the economy.

While not yet widely evident in empirical analysis and policy debate, the past two decades have seen fundamental changes at the level of basic economic theory. At the purely theoretical level, the Arrow/Debreu model has substantially collapsed under its own weight and that of the expertise devoted to it, at least in respect of Walras's original intent, to formalise a single system of neoclassical economics on the analogy of physics.

Over the past two decades, much work has been done to explore the behaviour of the model when each of these many assumptions are varied. That is, it has been explored for cases in which markets are not complete (e.g. Hahn 1989, Magill and Shafer 1991); when full information does not prevail (e.g. Stiglitz 1985, 1994; Laffont 1992); when there are increasing returns to scale and sunk costs (e.g. Panzar 1989, Quinzii 1992); when there are only a small number of firms and hence oligopoly rather than perfect competition prevails (e.g. Shapiro 1989); when technology is endogenous and new goods are created as a result of innovative activity (e.g. Romer 1990, 1994; Grossman and Helpman 1991), and so on. The standard model has proved to be a fertile framework in which to explore these variations, at least on an individual basis. Yet, in almost every case, the outcomes of the model change quite markedly each time the assumptions change. The model is not robust to changes in its assumptions in the direction of great realism - such changes lead to major changes to the modelling strategy required and to the descriptive and policy implications of the model.

It has been common to refer to situations in which the Arrow/Debreu assumptions are not realised in practice as cases of market failure, and to accept that the model does not apply in such cases. But two things have recently become clear: the situations in which the Arrow/Debreu assumptions do not hold are pervasive features of modern economies rather than isolated cases of market failure, and the implications for the model of the failure of the assumptions are fundamental and diverse rather than marginal. Thus the result is not one model with some minor variations, when particular types of market failure occur, but a wide range of very different models for different situations, each with quite different implications. I illustrate this fact below by considering briefly three cases - incomplete markets and imperfect information, the theory of growth and the theory of oligopoly - before touching on the welfare foundations of contemporary economics.

Incomplete Markets and Imperfect Information

Standard general equilibrium theory, as expressed in *The Theory of Value* (Debreu 1959) and as extended to cover uncertainty, employs a wide concept of 'commodity'. Commodities, which include both goods and services, are distinguished by physical attribute, delivery date, location and the situation or 'state of nature' prevailing when transactions are to be executed. In this model all trading, including trading in respect of transactions for all future periods, is assumed to take place at a single point in time, normally taken to be the instant before economic history begins. All commodities, in the sense defined above, are assumed to have a market and a price at the initial time at which trading takes place. That is, there is taken to be a market for black umbrellas in Cambridge on Christmas Day 2010 if it is raining, which establishes a price at which those umbrellas can be purchased at the initial time for delivery in Cambridge on Christmas Day 2010 if it is raining. There will be a different market and a different price for delivery of black umbrellas in Cambridge on that date if it is fine. *The assumption of complete markets*, in the sense that there is a market and a market price at the initial time for every commodity, *is a critical assumption of the theory.*

In a particular sense the model also assumes *perfect information*. Firms are assumed to know their own technology and hence their own production possibilities with certainty into the indefinite future, but need to know nothing about either the technology of other firms or the preferences of consumers, as they react only to prices. Consumers are assumed to know their own preferences into the indefinite future with certainty, but need no knowledge of the preferences of other consumers or the technology of firms. In this model it is uncertain at the time at which trading takes place, which states of nature will prevail at subsequent periods, although all possible states of nature are foreshadowed. However, for given prices, the present value of a production plan and of a consumer's resource endowments is certain, as is the cost of a consumption plan. Hence, for given prices, there is no uncertainty or risk facing producers in choosing the maximum value production plan - the price signals give all the information that is required. For given prices and given production plans, the consumer's budget constraint is known with certainty.

These are highly unrealistic, simplifying assumptions, as are those of any economic model. The question is how sensitive the model is to variations in the assumptions in the direction of greater realism. For the Arrow Debreu model, variation in these assumptions has fundamental results. When full information is no longer assumed and markets are not complete, how individuals acquire information becomes critical. But then the information available will depend on the actual historical path of the economy; so, contrary to the standard model, the equilibrium of the economy will depend on the particular historical path and the dynamics within it, and multiple equilibria may well be possible. Hahn and others have explored some of the drastic implications for general equilibrium theory of the dependence of future equilibria on the prior path of the economy (Hahn 1989), while much recent work in game theory has centred on the development of 'refinements' of the equilibrium concept to address the multiple outcomes endemic in repeated games of incomplete information (e.g. Fudenberg and Tirole 1991). In this context Hahn, who was a distinguished contributor to the development of general equilibrium theory, has concluded:

> But one thing does seem pretty clear: traditional Walrasian equilibrium analysis ... will not suffice - not even for comparative statics or dynamics. The history of an economy will have an influence not only on which equilibrium an economy finds itself in (if it does find itself in one), but also on the properties of such an equilibrium. (Hahn 1989, p. 107)

This simple fact of path dependence alone has extensive ramifications for economic theory, which have been explored in many different contexts. For example, David has emphasised path dependence both in the introduction of new technology (David 1985) and in

re-interpreting the nature of economics (David 1991). Arthur has used path dependence and the resulting feedback mechanisms to elucidate the choice of competing technologies in a situation of increasing returns (Arthur 1988) and in other contexts.

Many authors have also explored the consequences of the central economic fact of imperfect information, and the related fact that acquiring necessary information is often difficult and costly. Streams of literature exist exploring these consequences in diverse context, both in models of *adverse selection*, where there is imperfect information about what is bought and sold in the market, and of *moral hazard*, where there is imperfect information about actions undertaken by individuals. While this work is interesting and important in its own right, its consequences for the neoclassical paradigm are severe. Stiglitz, for example, has argued:

> What they (the results of work on information) show is how non-robust the Fundamental Theorem of Welfare Economics is. If one believes, as I do, that the problems of adverse selection and moral hazard are pervasive in the economy, then there is little ground for believing in the Pareto efficiency of the market economy. (Stiglitz 1985, p. 28; parenthesis added)

The Theory of Growth and Development

It has been noted above that in the basic neoclassical growth model, steady state growth is driven only by exogenous factors such as technological change and population growth. But this is a somewhat odd result, both from the perspective of neoclassical theory and of a world in which firms and nations spend vast sums on technological change with a view to spurring growth. One of the most important theoretical developments of the past decade has been the emergence of a vast array of *new growth models*.

These models are essentially neoclassical in spirit and origin, using a general equilibrium framework and in most cases the assumption of infinite horizon intertemporal optimisation by a representative consumer, or alternatively an overlapping generations model. Their broad goal is to understand steady state growth as endogenously generated within the economy - by learning, by the creation and use of new products or new process technologies and so on - rather than driven solely by exogenous factors. The key problem here is that if there are factors of production (such as labour) which are not accumulated, then if there are non-increasing returns to scale overall, the incentive to accumulate factors must fall over time, implying that investment and growth cease in due course. On the other hand, if the incentive to accumulate factors is to remain constant there will need be increasing returns to scale overall, and the modelling of increasing returns has been a recurring challenge to economic theory.

Many recent endogenous growth models, including the first of the new models (Romer 1986), follow the lead of Arrow's seminal 1962 paper on learning by doing, by introducing externalities into the production function. The papers by Arrow (1962) and Romer (1986) envisage an external effect on production of final output - a scale related learning by doing effect in the first case and a knowledge related technology effect in the second - which is carried by the aggregate capital stock. Lucas, in another key paper in the development of the new growth models (Lucas 1988), developed a parallel model focused on human capital. Thus the seminal Romer and Lucas models, which founded the new growth literature, relied substantially on technological and human capital externalities to generate increasing returns, and hence to drive continuing growth. Many subsequent models have used, often in conjunction with externalities, the other well-known method of reconciling increasing returns with the competitive market, viz. monopolistic competition.

The first steps towards modelling growth with endogenous technology in an environment of monopolistic competition related to increased product variety were also taken

by Paul Romer (1987, 1990). In this type of model increasing returns and continuing growth are driven by the continuing creation through research of new capital goods, which in turn increase the efficiency of final goods production. A parallel route to growth models with endogenous technology has been to study the process of continual increases in the quality of products, with consumers achieving greater utility by the consumption of products of progressively higher quality. Important pioneering papers on this approach were Segerstrom et al. (1990) and Aghion and Howitt (1992), while the approach was developed further by Grossman and Helpman (1991), Segerstrom (1991) and Young (1993).

It is obviously not my purpose here to undertake a survey of the vast array of new growth models. For a survey of this literature see Romer (1990), the papers in the Winter 1993 issue of the *Journal of Economic Perspectives*, Sheehan (1993) or Barro and Sala-i-Martin (1995). What is relevant here is the diversity of these models, the extent of their various differences from the basic neoclassical view of growth and their wide range of policy implications. Here I will illustrate the diversity of outcomes of this work by focusing on the policy implications of some of these models.

Several findings are fairly general, although details clearly differ markedly from model to model. In spite of the neoclassical origins of most of the new models, however, their policy implications are often quite at variance with received doctrine. Other policy implications are quite diverse, reflecting the diverse and rapidly changing nature of this literature. Outlined below are four main policy related themes or tendencies in this literature. They are presented as illustrative, without it being claimed that they are either uniform findings of the literature or that they have been in any sense established as true. They also remain entirely theoretical effects, and it is quite a different question whether the mechanisms which underlie them are practically important in real economies.

i. *Non-Optimality and Policy* Given the nature of most of these new growth models, the competitive market solution often does not generate the socially optimum rate of growth. In most cases this involves the market growth rate being less than the social optimum, but in models with strong obsolescence effects the direction of the net effect may be unclear. For the very same reason, intervention directed at the source of the deviations from the social optimum will increase the steady state growth rate in many of these models. Among the policy initiatives likely to increase growth in individual models are:

- subsidies to R&D;
- subsidies to output or investment, when they carry learning by doing effects;
- subsidies to investment in human capital;
- increased public investment funded by income tax, and
- subsidies to innovation and imitation.

ii. Growth, Trade and Comparative Advantage In many of these models the benefits of trade in terms of global income or growth are enhanced relative to the standard competitive model. This is so if the increase in knowledge, technology or innovation which drives growth is greater when national economies are open to international influences in these areas through trade. Such linkages are often postulated. But these benefits do not necessarily flow through to individual countries.

When growth is driven by innovation, learning by doing or other externalities and these effects are geographically concentrated, initial conditions can generate major long-term differences between countries in comparative advantage and in growth potential. If the industries in which a small country is specialised are deficient in relevant respects (e.g. have a lower capacity for learning by doing, have lower returns to or lower capacity for R&D or have lower levels of other externalities) then free trade will inhibit the growth of the small country,

because it will tend to concentrate activity in areas of comparative advantage with lower capacity to generate growth. In such a case, a national policy, e.g. to promote R&D, could have a major positive impact on the economic history of the country in question, generating forms of comparative advantage. In appropriate circumstances, then, a given national policy can generate a dynamic comparative advantage. Thus some of these models generate an outcome in which free trade benefits world growth as a whole but does not benefit certain nations which are deficient in the externality or other factor driving growth, and in which concerted national policy could on occasion create comparative advantage.

iii. Low Growth Traps It follows from many of these models that it is possible for a country which is specialised in industries deficient in relevant respects to enter into a self reinforcing low growth trap. This is true in appropriate circumstances both in closed economy models (such as the closed economy overlapping generations models) and under free trade. In the latter case, the pattern of trade will reinforce the adverse pattern of comparative advantage, generating increasing inequality among nations.

iv. Strategies for Economic Development One of the most important aspects of some of the new growth models is the formalisation of economy-wide growth policies or economic strategies, whether the 'big push' concept of coordinated development, the promotion of leading sectors with strong complementarities with other sectors or the systematic creation of expectations of rapid growth. The formal modelling of such strategies, much discussed in the economic development literature, especially in the 1950s and 1960s, but sharply at odds with standard neoclassical models, is path-breaking work in economics. Some of these models thus envisage a potential role for policy much more in line with various development programs than with traditional economic theory, such as the encouragement of leading sectors by policy action or the coordinated expansion of a number of sectors in a 'big push' for growth.

Indeed, Krugman has recently called for a 'counter-counterrevolution in development theory' arguing that:

> ... during the 1950s a central core of ideas emerged regarding external economies, strategic complementarity and economic development that remains intellectually valid and that may continue to have practical applications. ... Recent developments in economics now make it possible to reconsider what the development theorists said and to regain the valuable ideas that may have been lost. (Krugman 1993, p. 16)

More generally, growth theory will never be the same again. This explosion of work has created the capability to model formally a vast array of conceptions of growth, and to derive diverse policy implications. To paraphrase Keynes, the key issue now is not so much to develop new models of growth and development, at least within this modelling tradition, but to develop 'the art of choosing models which are relevant to the contemporary world'.

The Theory of Oligopoly

Another central feature of the Arrow/Debreu model is that a sufficiently large number of firms are assumed to exist to ensure that no firm has market power, and that the interaction between firms takes place only on the basis of prices set in purely competitive markets. It seems apparent that this is far from the case in modern economies, that market power is common and that much competition takes place between a small number of firms in oligopolistic markets. This central fact has led to extensive work on the theory of oligopoly, and to the application of this theory to markets in which a small number of firms compete. At the heart of this work has been the application of game theory. As Kreps rightly claims:

> Over the past decade or two, academic economics has undergone a mild revolution in methodology, viz. the language, concepts, and techniques of non-cooperative game theory have become central to the discipline. (Kreps 1990, p. 1)

Most participants in the discussion about the application of game-theoretic methods to oligopoly, and to other issues in industrial organisation, accept that great benefits have been derived 'from getting economic analysis to make qualitative contact with the world around us' (Dasgupta 1989, p. 619) by the application of game theory. Indeed, it is impossible to read the two volumes of the recent *Handbook of Industrial Economics* (Schmalensee and Willig 1989) without a sense of the richness which game theory has brought to the economic analysis of the industrial world. But most participants also acknowledge that at present this approach has major limitations, with serious problems to be addressed. Few would go as far as Fisher (1989) in claiming that the analysis of oligopoly has not been advanced at all by the game-theoretic work, but few also would deny the extent of the limitations of current approaches.

The central issue is that, sitting as it does squarely between the two polar cases of pure competition and full monopoly, the modern theory of oligopoly has not been able to progress beyond a sophisticated analysis of a wide range of special cases, and that indeed a wide range of game theoretic assumptions have to be made to handle these diverse cases. Thus the main problems and limitations of current game-theoretic models in industrial organisation can be classified as follows:

- the prevalence of multiple equilibria in these models;
- the delicacy of the equilibria, in the sense of sensitivity to small variations in information or in assumed pay-offs;
- the difficulty of handling satisfactorily out-of-equilibrium situations and beliefs;
- the implausibility of the common knowledge and super-rationality assumptions;
- the heavy reliance on detailed specification of rules and protocols, without any adequate reason for choosing any particular specification, and
- the apparent intractability of the most realistic type of model, dynamic games of incomplete information.

Again, we see in the application of game theoretic techniques to oligopoly and other issues in industrial organisation the emergence of a rich, diverse and highly specific set of models for understanding particular sets of circumstances. These are powerful tools, but the enterprise is far from the original Walrasian one of the single, universal scientific theory.

Value and Welfare

I have noted above that Skidelsky said of Keynes that he was 'the last great economist to hold economics in some sort of relation to the 'good life'', and that in this as in other respects he was echoing a vanishing world rather than being a harbinger of the new (Skidelsky 1992). Another important recent development has been that, for both practical and theoretical reasons, many contemporary economists have come to question the deliberately neutral concept of utility or of a structured set of preferences which lies behind standard economic theory. The practical reasons relate to the manifest facts that growth as defined by economists does not always advance human welfare and that some low growth changes can make people better off than other changes which induce more rapid growth. Broader and more inclusive concepts of human welfare seem to be necessary, not only in political debate but also in economic thought.

At the theoretical level there seem to be three main reasons. The first relates to the viability of welfare economics in the light of Arrow's Impossibility Theorem. The Second Fundamental Theorem of Welfare Economics is supposed to separate the economic efficiency issue from the moral or distributional issue, by showing that any preferred distribution can be achieved by some competitive equilibrium, by appropriate lump sum payments. But how,

within this framework of discrete individual preferences, can the community or a benevolent social planner acting on behalf on the community, determine what is a preferred distribution? As early as 1954 Arrow showed, in what became known as his Impossibility Theorem, that there can be no process for deriving the preferences of society from those of individuals which is consistent with certain basic tenets of rationality. This result strikes at the key claim that any morally desirable outcome can be achieved through competitive markets, for the very framework in which this is purportedly shown to be always possible is also one in which it is impossible to determine preferred community outcomes. Arrow's result was widely believed to be a temporary setback, but after forty years and a vast amount of literature it still stands. As Feldman put it in the *Palgrave Dictionary of Economics*:

> Since the ...(Impossibility) theorem was discovered, a whole literature of modifications and variations has been spawned. But the depressing conclusion has remained more or less inescapable: there is no logically infallible way to aggregate the preferences of diverse individuals. By extension, there is no logically infallible way to solve the problem of distribution. (Feldman 1991; parenthesis added)

The second reason relates to the failure of the assumptions required to prove the Second Theorem. This is even more reliant than the First Theorem on the highly restrictive assumptions characteristic of the Arrow/Debreu structure. For example, Stiglitz and others stress the failure of the Second Theorem in a world, the actual world, in which imperfect information is pervasive (Stiglitz 1994). When information failures lead to problems of adverse selection or moral hazard, or more generally problems of incentives, the theorem no long holds. And in a world of imperfect information on the part of the government as well, there is no way in which the informational requirements of the lump sum payments required to meet desired redistributional goals could be met.

Let me give another recent example of the sensitivity of the neoclassical model, in matters related to distribution, to small variations in assumptions. Freeman has started with a standard model due to Diamond (1965) and introduced just two variations to the standard assumptions: that production displays increasing returns to scale and that agents are unable to fund human capital investments with consumption loans (Freeman 1996). On this basis he shows that, in the model, inequality exists and persists even given *ex ante* identical individuals, that if agents have an altruistic bequest motive, income and educational differences persist over generations and that the middle class acquires more education than either the poor or the rich. These findings are not only more in line with reality than those of the standard model, but also profoundly different from them both in content and spirit in spite of only modest variations in the assumptions.

The third reason for a re-emergence of moral issues into the substance of economics relates to the view that the information base of the standard preference view is too narrow to support an adequate account of the social good. In the revealed preference view flowing from Arrow/Debreu, an individual's preferences are revealed by his choices. A social welfare function is an aggregation of such revealed preferences, assigning an index of social value for society to every possible social state. But the fact that a person A chooses x over y is not evidence that x is better for A than y, or even that A values x more highly than y. People often act against their own better interests, and even against what they perceive as their own better interests, and come to regret such actions. A social planner, who purports to aggregate individual views in a disinterested fashion to form a social value function, can only do so from some perspective about what is valuable. If she chooses to aggregate individual values in terms of revealed preferences that is in itself a value choice, and a very doubtful one at that.

Sugden has recently summarised the position succinctly:

> Revealed preference welfarism - the approach which has been standard in normative economics for the last forty years - may have to be given up. Our present awareness of

> the limitations of that approach is largely due to Amartya Sen. If revealed preference welfarism does have to be given up, there seem to be two main ways of reconstructing normative economics. One is to start from a conception of what makes a good life for a human being, and to build up from this to a theory of the social good: this is the enterprise to which Sen's work belongs. The other is to focus on the rules which govern social interaction, and to evaluate these rules against procedural criteria. (Sugden 1993, p. 1961)

How these and related matters may evolve remains to be seen. But one upshot is an important literature about 'the quality of life' in economic theory and practice, which has been particularly driven by the work of Sen, who has developed his own substantive concept of welfare in terms of human capabilities and functionings (Sen 1992; Nussbaum and Sen 1993). The 'good life' is returning as a central concern of economics.

Conclusions

Two general conclusions seem to have emerged clearly from the work briefly reviewed in this section. Firstly, the basic neoclassical model is not robust, in that quite different results emerge from small variations in assumptions. Indeed, this work has been taken to show that the standard model applies only in highly exceptional circumstances, most unlikely to apply in the real world. Secondly, perfectly good models can be built with a very wide range of different sets of assumptions, no one of which can claim to be a preferred representation of all or even most of the economic world. Thus there is no longer one preferred model but rather many models, each appropriate for different circumstances. The implicit goal of a single explanatory model of the economic system now looks implausible, while the value neutral foundation of individual preferences or utility has been shaken. *From all this it seems to follow that economics must be seen not as the search for the single universal model akin to physics but as a diverse and sophisticated set of tools, to be used wisely to guide judgement in the understanding of many different situations.*

5. Keynes and the Contemporary Enterprise of Economics

Thus my argument is that contemporary economics within the broad neoclassical tradition faces something of a crisis of self perception. While an explosion of interesting and creative theoretical work continues apace, in sum the results of this work are far from consistent with the original conception of the enterprise, or indeed that of the vast bulk of economists who work, teach and advise within this tradition. What may be in prospect, I argue, is an economics which seeks to develop diverse and sophisticated tools to aid practical judgement in a wide range of different contexts, while building a normative base on a substantive analysis of what constitutes a good life for human beings at a particular time and place. This approach to economics would be consistent with trends in other relevant disciplines, from mathematics, where diverse and competing bodies of theory have replaced the single universal truth, to philosophy and political theory, where the atomistic individual has been superseded and where there is renewed emphasis on the need for a substantive concept of the good (Sheehan 1995).

Such an economics would certainly be very different in intent from the old neoclassical vision of a universal, value-free science. It would almost certainly provide very different policy prescriptions for many but not all of the key issues facing the world community. Indeed, it would be what Keynes would have called a *moral science*, and I can think of no better description of the nature and practice of such a conception of economics than the four points used above to summarise Keynes's enterprise, namely:

- the reality with which economics deals is one of great diversity and complexity, which involves important psychological components and which changes over time, and in which radical uncertainty is endemic;
- the ability to develop and handle a wide variety of models is central in the light of this diversity, variability and uncertainty, and pseudo-scientific reliance on a single model must be avoided;
- the essence of good economics is the ability to judge which of a wide variety of available models throws most light on a given practical situation, and
- in making those analytical judgements and generating policy recommendations, rational value judgements and assessments of probability are highly relevant, so that considerations of value cannot be excluded from the economic enterprise.

This emerging revolution in the understanding of the nature and role of economics, thoroughly Keynesian in spirit yet driven inexorably by ongoing theoretical developments, will be as important to policy in the future as were the revolutions of either Keynes or the neoclassicals in the past. For it will force the economist back to the ground which Keynes inhabited - careful selection of the best model for a particular diagnosis rather than automatic application of the one true model, and careful consideration of values and human welfare rather than the easy assumption that the market always delivers the best outcome.

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