4 Some Assumptions of Contemporary Neoclassical Economic Theology

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Economics is not only a branch of theology. (Joan Robinson, 1962, p.25)

Belief in the free market is a common form of idolatry born of an ideology which hits hardest at the worst-off in society. (The Rt Revd David Jenkins, Bishop of Durham, speaking in the House of Lords; cited in the *Manchester Guardian Weekly*, 23 June 1985)

'But then . . .' I ventured to remark, 'you are still far from the solution . . .'
'I am very close to one,' William said, 'but I don't know which.'
'Therefore you don't have a single answer to your questions?'
'Adso, if I did I would teach theology in Paris.'
'In Paris do they always have the true answer?'
'Never,' William said, 'but they are very sure of their errors.'
'And you,' I said with childish impertinence, 'never commit errors?'
'Often,' he answered. 'But instead of conceiving only one, I imagine many, so I become the slave of none.' (from Umberto Eco, *The Name of the Rose*, near the end of 'Nones' on the 'Fourth Day')

1 ASSUMPTIONS ARE NOT TO BE COMPARED WITH REALITY

'The two questions to be asked of a set of assumptions in economics are these: Are they tractable? and: Do they correspond to the real world?' (Joan Robinson, 1932 p.6)

*A respectful tribute to the late Joan Robinson. Although her teaching failed to prevent me from committing the double sin of becoming both a 'neoclassical' and a welfare economist, I hope that, even so, she might have agreed that amongst much else her classes in economic theory at least taught us some healthy skepticism, as well as how to discuss theory without using squiggles. My thanks to Mervyn King for very detailed and helpful comments, to George and Ida Feiwel for their encouragement and helpful suggestions, to Avinash Dixit for pointing out that Keynes himself devised the neoclassical synthesis, to John Taylor for his efforts to teach me some macroeconomics and to Mordecai Kurz for reducing my errors by at least one.

TABLE 4.1 List of assumptions

1. Assumptions are not to be compared with reality
2. Consumer sovereignty
3. Unbounded rationality
4. Unbounded forethought
5. Unbounded cooperation
6. Pareto efficiency is sufficient for ethical acceptability
7. The distribution of wealth is ethically acceptable
8. Consumers can survive without trade
9. Income effects are negligible
10. Pareto efficiency is necessary for ethical acceptability
11. There is a representative consumer
12. Distortionary taxes create deadweight losses
13. Domestic public expenditure programs are wasteful
14. Transfer programs confer no benefits
15. Capital markets are perfect
16. Anticipated monetary and fiscal policies are ineffective
17. Inflation is caused by an expanding money supply
18. There is a representative worker
19. The current level of unemployment is ethically acceptable
20. There is a representative capital good
21. Product markets are perfectly competitive or at least contestable
22. Neoclassical economics need not be theological.

In her classes in Advanced Economic Theory at the University of Cambridge, Joan Robinson would frequently say to us students, 'Always state your assumptions.' As a model, chapter 1 of her first major book, *The Economics of Imperfect Competition*, is indeed entitled, 'The Assumptions'. Moreover, in her later books, *Economic Philosophy* and *Economic Heresies*, she discussed the assumptions underlying standard neoclassical economics, all too many of which are all too often left implicit, and explained why she thought so many economists seem willing to accept those assumptions unquestioningly. So I propose to return to this theme and to consider the assumptions listed in Table 4.1. Too many people who discuss economic policy these days appear to take many of these assumptions for granted, despite their not being securely based either on empirical fact or on acceptable ethics.

The very first assumption to be discussed is Friedman's (1953) contention that the assumptions of economic theory should not be compared with reality. This drastic assumption appears to deny Joan Robinson the freedom to choose to speak out against the assumptions of neoclassical economics, as she did so effectively throughout her career. Friedman argues for his approach to positive economic analysis in the following words:

> One confusion that has been particularly rife and has done much damage is confusion about the role of 'assumptions' in economic analysis. A meaningful scientific hypothesis or theory typically asserts that certain forces are, and other forces are not, important in understanding a particular class of phenomena. It is frequently convenient to present such a hypothesis by stating that the phenomena it is desired to predict behave in the world of observation *as if* they occurred in a hypothetical and highly simplified world containing only the forces that the hypothesis asserts to be important . . .
>
> Such a theory cannot be tested by comparing its 'assumptions' directly with 'reality'. Indeed, there is no meaningful way in which this can be done. Complete 'realism' is clearly unattainable, and the question whether a theory is realistic 'enough' can be settled only by seeing whether it yields predictions that are good enough for the purpose in hand or that are better then predictions from alternative theories. (Friedman, 1953, pp.40–1)

I have heard this interpreted to mean that one should not compare *simplifying* assumptions with reality. This makes Friedman's bland statement a little more palatable, providing that one follows his view of what economic theory should be about. Indeed, the fundamental flaw with Friedman's approach to positive economics, in my view, is its failure in practice to heed data other than a narrow selection of empirical economic data. For, especially in connection with topics like price theory and the quantity theory of money, the only economic data considered often involve only aggregate quantities or aggregate commodity demands, and pay almost no attention to the distribution of money holdings, commodities, etc. Unless one is very careful, a model of the economy that predicts just prices and aggregate quantities becomes thereby more acceptable than one which notices the possibility of inequalities of income and poverty leading to people dying of starvation, committing suicide as a result of depression brought on by a prolonged spell of unemployment, or other important human phenomena that are often not well captured by economic statistics. A positive economic theory that completely neglects social statistics is a poor and inhuman theory, too dangerous to be acceptable in policy analysis. As Joan Robinson wrote in her note on welfare economics, at the end of *The Accumulation of Capital*:

> If we want to form an opinion on the economic well-being of a community, we look to such things as the food consumed, the conditions of housing and work-places, the variety of different kinds of goods being consumed (for we know that with rising wealth families purchase more kinds rather than greater quantities of goods). We look to such phenomena as the infant death rate for pointers to the effect of the level of consumption on the health of the community, and to such phenomena as the prevalence of

> alcoholism and neurosis to judge how great a strain the rules of the game that they are playing put upon human nature. (Robinson, 1956, p.390)

In one sense, I shall not disobey Friedman's assertion that, in positive economics, one should not discuss the (simplifying) assumptions on an *a priori* basis. This is because my primary concern will be with normative rather than positive economics. Yet, in another sense, I will be disputing his claims rather vigorously, in arguing that much of positive economics is based on assumptions that are so unrealistic as to make coherent normative analysis of economic policy at best impossible and at worst highly misleading.

The fact that so many completely unrealistic or unethical assumptions appear to underlie a great deal of contemporary economic policy analysis prompts two questions. The first is why such absurd assertions masquerading as assumptions continue to enjoy such widespread acceptance. The second is what can be done to relax the more obnoxious assumptions. Of these two questions, the first received an answer from Joan Robinson herself; indeed, in large measure this was precisely the question she addressed in *Economic Philosophy*, from which the following is taken:

> It is precisely the pursuit of profit which destroys the prestige of the business man. While wealth can buy all forms of respect, it never finds them freely given.
>
> It was the task of the economist to overcome these sentiments and justify the ways of Mammon to man. . . . It is the business of the economists, not to tell us what to do, but to show why what we are doing anyway is in accord with proper principles.
>
> In what follows this theme is illustrated. . . . in an attempt to puzzle out the mysterious way that metaphysical propositions, without any logical content, can yet be a powerful influence on thought and action. (Robinson, 1962, pp.24–5)

This is as good an explanation as any other I am aware of, and it is one that we ignore at our peril. So I shall also consider how so many of the results of neoclassical economic analysis appear to support *laissez faire* policies, without necessarily wishing to suggest that neoclassical economics has worked backwards from the *laissez faire* policies to the assumptions that sustain them. And I shall in some cases discuss how one might proceed to improve the quality of economic policy analysis by replacing the more objectionable assumptions with others that are not only more acceptable on both empirical and ethical grounds, but may also not be impossibly difficult to use in practice when analyzing policy questions.

The first part of the essay will concentrate upon microeconomics, and especially the two fundamental efficiency theorems of welfare economics

which are often used to justify *laissez faire* policies. The last few assumptions concern topics more closely associated with macroeconomics, such as money and unemployment, although I shall discuss these from a microeconomist's point of view.

Assumptions 2 to 6 concern the first of the two fundamental efficiency theorems of welfare economics, which states that complete markets in perfectly competitive or Walrasian equilibrium produce an allocation which is Pareto efficient. Assumption 2 is the ethical value judgment of consumer sovereignty, which is absolutely essential to give this theorem any ethical significance. So is 'unbounded rationality', included as Assumption 3, which denies that consumers are boundedly rational in the sense of Simon (1982). An extension of the concept of bounded rationality to deal with a dynamic economy is considered next; Assumption 4 calls this 'unbounded forethought', which is a concept designed to recognize the replacement of the old perfect foresight assumption by the newer one of rational expectations. Indeed, unbounded forethought is in some sense a generalization of rational expectations which allows for the possibility that agents may never receive enough information to learn the whole truth.

A crucial assumption of the first efficiency theorem is the absence of externalities, or at least their internalization through a system of property rights. This is considered in Assumption 5, which deals with 'unbounded cooperation'. It is also argued that these three assumptions of unbounded rationality, forethought, and cooperation are quite unnecessary unless one is determined to give *laissez faire* an ethical justification. But they can only possibly do this, in general, if it is accepted that Pareto efficiency is sufficient for ethical acceptability, which is Assumption 6. Not surprisingly, Pareto efficiency is found wanting because of its failure to take into account the distribution of income or wealth.

This brings us to the second fundamental efficiency theorem of welfare economics. This theorem characterizes all the Pareto-efficient allocations in an economy – except those that give trouble as in Arrow's (1951) 'exceptional case'. With enough convexity and continuity in the economy to ensure that Walrasian equilibrium exists, the second efficiency theorem tells us that any Pareto-efficient allocation can be achieved by setting up complete and perfectly competitive markets, and allowing them to reach an appropriate Walrasian equilibrium. This relies on Assumption 7, however, requiring that the initial distribution of wealth is exactly right so that each consumer can just afford to buy what he is supposed to in the given Pareto-efficient allocation. So, in order to ensure that an ethically acceptable allocation really is achieved in perfectly competitive markets, one must effectively assume that the initial wealth distribution is, if not optimal, then at least ethically acceptable.

I trust that it would be generally agreed that the initial distribution of wealth is ethically unacceptable when some consumers are so poor that they

find themselves at or below the margin of subsistence. This problem in economic theory is usually circumvented by Assumption 8, that all consumers can survive without trade, in which case, of course, free trade cannot drive them down below the margin of survival. Assumption 9 then turns to the common procedure in applied economics of ignoring all income effects. Apart from simple laziness or sloppiness, this may be to avoid recognizing the importance of income distribution, which undermines the ethical appeal of *laissez faire* policies.

The physical feasibility constraints of the economy require that no agent supply more than he is able to, given the extent to which his demands are met, and also that the obvious resource balance contraints are satisfied. The second efficiency theorem characterizes (virtually all) the allocations which are Pareto efficient among this set of physically feasible allocations. Yet the appropriate schemes of lump-sum redistribution of wealth which are needed to give the second efficiency theorem its ethical significance use a great deal of information about individuals' needs, abilities, and other relevant personal characteristics. Much of this information is originally private to the individual. The 'revelation principle' of the recent literature on incentive compatibility then says that, because individuals have to be induced to reveal any private information which the mechanism uses, truly feasible allocation mechanisms have to satisfy additional 'incentive constraints' as well as the physical feasibility constraints. When trading in an 'underground economy' cannot be effectively prohibited, further incentive constraints are added which may even imply that only Walrasian allocations are truly feasible, so that markets have to be seen as constraints upon rather than the instruments of good economic policy. The ethical significance of the second efficiency theorem of welfare economics therefore relies on Assumption 10, which is that Pareto efficiency, in the usual first-best sense, is necessary for ethical acceptability. This assumption neglects the incentive constraints.

This serious lapse is often circumvented, especially in macroeconomics, by Assumption 11, that there is a representative consumer. Thereafter, Assumption 12 denies an often neglected implication of the incentive constraints which prevent optimal lump-sum redistribution, namely, that the deadweight losses created by 'distortionary' taxes are illusory, since there is really no way of eliminating them. Indeed, optimal taxes may well be distortionary, as in Diamond and Mirrlees (1971). Assumptions 13 and 14 then embody the rather extreme claims we sometimes hear that domestic public expenditure programs are wasteful, and that transfer programs confer no benefits. One of the arguments supporting such claims is that public expenditure and transfer programs, even if they are not inherently distortionary, at least rely on distortionary taxes for their finance. Once we accept that distortions are inevitable, the force of such arguments is greatly reduced.

Assumption 15 is that capital markets are perfect – one of the most common assumptions of much contemporary neoclassical analysis. Yet it

will be argued that lenders always face moral hazard in capital markets because some borrowers have an incentive to borrow more than they could ever afford to repay. So perfect capital markets are impossible, and some form of non-price rationing of credit to limit each borrower's maximum permissible debt is inevitable. This lends theoretical support to the 'Clower' or 'cash in advance' constraint which has played a prominent role in some of the better recent work in macroeconomics. Then Assumption 16 considers what underlies the remarkable recent contention of some macroeconomists that no policy can be effective – or at least efficient – unless it catches people by surprise. This contention is closely linked to Assumption 17 concerning the neutrality of money, the quantity theory, and the monetarists' belief that inflation can only be caused by an expanded monetary supply.

After money, the next macroeconomic topic is unemployment, and Assumption 18, that there exists a representative worker. It is suggested that this assumption makes it virtually impossible for most of macroeconomic theory to explain unemployment. Also, while the Keynesian concept of involuntary unemployment is hard to explain unless one follows Kalecki and others in introducing imperfect competition and administered money prices and wages, there may be a useful concept of 'involuntary hardship' – a state in which many people with very limited job opportunities may well find themselves even if there is Walrasian market clearing. Assumption 19, that the level of unemployment is ethically acceptable – or that there is little that can be done about it – leads to a brief discussion of the 'neoclassical synthesis' (starting with a suggestion of Keynes himself), and of the 'bastard Keynesians' who saw fit only to consider economies in which the government had been able to find and to pursue a macroeconomic policy resulting in continuous full employment.

It seems that many young economists think of Joan Robinson primarily as a capital theorist, who happened also to write extensively on Marxian economics, development, and also wrote an early book on imperfect competition. None of these topics is touched on in the first nineteen Assumptions of this paper (except perhaps development, in connection with Assumption 8 and the possible non-survival of very poor consumers). Yet both her collected papers and her classes were full of relevance to almost every topic considered in those nineteen Assumptions. Of the four topics just mentioned, I shall leave others to write about Marx and about development. The next two assumptions, however, concern capital theory and imperfect competition.

The capital theory debate was really about Assumption 20, which postulates the existence of a 'representative capital good'. One must agree with many others – including even Joan Robinson – that the whole debate was really a waste of time, because the assumption is clearly unreasonable, and anyway nothing very important hangs upon it. Nor is steady state growth very interesting in a world of exhaustible resources.

As for imperfect competition, Assumption 21 embodies the recent attempt of Baumol (1985) and his associates to use the theory of 'contestable' markets to set a new normative standard for judging the performance of a given industry. The defects of the perfect competition defense of *laissez faire* simply reappear in a new guise. And even if the new normative standard were acceptable, it would seem *a priori* that many partly unionized labor markets are much closer to meeting it than the markets for the outputs of large corporations.

The obvious conclusion of this essay is that the future of neoclassical economics depends crucially upon the validity of Assumption 22 – that neoclassical economics need not be theological. What case there is for *laissez faire* has to be based on the cost of intervening in the economy rather than on theological arguments concerning 'efficient' or 'optimal' allocations. If I do continue to pursue neoclassical welfare economics, it is because I believe that, when it has been purged of its theological content, it has the best chance of providing useful policy advice, and of suggesting improvements to the form of public intervention in the economy.

2 CONSUMER SOVEREIGNTY

> The central doctrine of orthodox economics is the defence of the freedom of anyone who has money to spend, to spend it as he likes. (Robinson, 1979a, p.92 and 1980a, p.99)

The grammar which professional economists use to discuss economic policy is, of course, welfare economics. A fundamental value judgment that is made in almost all welfare analyses is the sovereignty of consumer choice – that the preferences revealed by a consumer's demand behavior correspond exactly to an ordinal indicator of his welfare, or even to a cardinal indicator if choice under uncertainty is being discussed and if the expected utility hypothesis is satisfied.

Consumer sovereignty is popular with economists for a number of reasons, of which the most important is that the fundamental efficiency theorems of welfare economics acquire all their ethical significance from this particular value judgment. The first fundamental theorem, due to Arrow (1951), says that any allocation which results from perfect competitive markets in general equilibrium must be Pareto efficient. That is, there is no other feasible allocation which simultaneously moves each consumer to a new bundle of goods which he or she could choose in preference to the old bundle. So far, this is just a factual statement about what each consumer would choose among two hypothetical alternative commodity bundles. The consumer sovereignty ethical value judgment is then used to overcome the distinction

between facts and ethical values, called 'Hume's Law' by philosophers, in order to be able to claim that the fact of moving each consumer to a preferred position is desirable as an ethical value. As Joan Robinson puts it in *Economic Philosophy*:

> We are told nowadays that since *utility* cannot be measured it is not an operational concept, and that 'revealed preference' should be put in its place. Observable market behaviour will show what an individual chooses. Preference is just what the individual under discussion prefers; there is no value judgement involved. Yet, as the argument goes on, it is clear that it is a Good Thing for the individual to have what he prefers. This, it may be held, is not a question of satisfaction, but freedom – we want him to have what he prefers so as to avoid having to restrain his behaviour.
>
> But drug-fiends should be cured; children should go to school. How do we decide what preferences should be respected and what restrained unless we judge the preferences themselves?
>
> It is quite impossible for us to do that violence to our own natures to refrain from value judgements. (Robinson, 1962, p.50)

So the first efficiency theorem is converted into an ethical proposition, because Pareto-efficient allocations like those that result from perfectly competitive markets have the property that it is infeasible to make all consumers better off than they are in the efficient allocation.

The second fundamental efficiency theorem, due to Arrow (1951) and Debreu (1951), says that, under conditions like continuity, convexity, and local non-satiation of preferences, as well as resource-relatedness of consumers, any Pareto-efficient allocation can be decentralized through a complete system of perfectly competitive markets, provided that the initial distribution of property rights is determined in exactly the right manner to produce that particular efficient allocation in equilibrium. Provided discussion is limited to what individuals actually choose, this is again just a purely factual proposition, like the first efficiency theorem. Without a value judgment like consumer sovereignty, allocations that individuals would actually prefer to choose have no normative significance whatsoever. To give such allocations the normative significance that economists usually accord to them, *some* ethical value judgment has to be introduced; consumer sovereignty just happens to be the most obvious and attractive one that works.

So one reason why consumer sovereignty has been popular with economists is that it justifies the invisible hand and *laissez faire* economic policies that business-minded economists naturally feel sympathetic toward. A better reason may simply be that, although consumer sovereignty is undoubtedly a value judgment, it is much less obnoxiously paternalistic than alternative value judgments would have to be, since they would have to specify what was good for an individual if what that individual wanted was not good. Thus,

consumer sovereignty is obviously closely related to the libertarian position in ethics, which makes the rights of the individual the supreme arbiter of all ethical questions, as in Nozick (1974). And Rawls' *Theory of Justice* (1971), which puts liberty prior to any other 'primary good', is another way of advocating consumer sovereignty, in effect.

Nevertheless, making rights supreme turns out to be a much stronger statement than saying that Pareto superior allocations are ethically preferred. Libertarians regard any form of coercive taxation as unjustifiable in any circumstances. This relates closely to Assumption 7, that the distribution of wealth is ethically acceptable to the extent that no redistribution is required.

This general acceptability of the consumer sovereignty value judgment is what I believe lies behind Archibald's (1959) otherwise extraordinary claim that welfare economics should become a branch of 'positive economics' and confine itself to finding ways of satisfying those preferences of consumers that happen to dictate their behavior in the marketplace. Lerner (1972) has also made an energetic defense of consumer sovereignty. I single out these two authors only because they at least realized that there really is an issue here, and that consumer sovereignty is a value assumption. Of course, many of the more philosophically inclined economists, apart from Joan Robinson, such as Sen (1973) and Broome (1978), have also discussed and indeed heavily criticized the consumer sovereignty value judgment. Nor should one forget the work of Harsanyi (1954) and Gintis (1972a, 1972b, 1974) criticizing consumer sovereignty when tastes are endogenous.

From a more practical perspective, it is clear – indeed, even tautological – that we would prefer to be able to exercise our choices as freely in the marketplace as anywhere else. Evidently, purchasing decisions that cause externalities such as pollution and congestion are clear instances of when some control seems desirable. But wanting to control such purchasing decisions does not really violate the sovereignty of consumers as a whole, because the reason for wanting to interfere with the demand of one consumer is precisely that it affects the objects of preference of other consumers. Standard examples of desirable paternalism – such as seatbelts in cars, young children and drug-takers – may really just be other instances of externalities, rather than examples of the undesirability of consumer sovereignty, although there are some reasons to believe that the individuals in question really are not making the best decisions according to their genuine long-run preferences in these cases.

Yet consumer sovereignty is not universally desirable by any means. If it were, it would always be beneficial – externalities apart – to widen the range of opportunities available to any one consumer. Who, however, has not sometimes felt bewildered when suddenly faced with a wide range of choice over some important issue, such as the choice of a pension plan? And almost preferred to have the opportunity to choose taken away – provided, of

course, that the right choice winds up being made on the individual's behalf! An even more convincing example of the undesirability of complete consumer sovereignty is when individuals are imperfectly informed, and indeed even know that they are. An ill-informed consumer knows that somebody else with better information – an 'expert', perhaps – could make a better decision on his behalf. It might be better still if that consumer could become better informed himself, but we should admit that consumers can easily become overloaded with information – 'confused', in fact. That brings us to bounded rationality which is my next subject.

3 UNBOUNDED RATIONALITY

> In short, no economic theory gives us ready-made answers. Any theory that we follow blindly will lead us astray. To make good use of economic theory we must first sort out the relations of the propagandist and the scientific elements in it, then by checking with experience, see how far the scientific element appears convincing, and finally recombine it with our own political views. The purpose of studying economics is not to acquire a set of ready-made answers to economic questions, but to learn how to avoid being deceived by economists. (Robinson, 1960, p.17)

Thus does Joan Robinson conclude her lectures on 'Marx, Marshall, and Keynes', delivered at the Delhi School of Economics in 1955. If people are so easily deceived by economists, then how much more unreasonable is it to assume that they are capable of making perfectly rational decisions. In fact, Simon (1982, 1983) and others have given convincing and extensive discussions of how people who actually make decisions exhibit various forms and degrees of 'bounded rationality', in the sense that they do not appear to be maximizing a consistent preference ordering in the way that neoclassical economic theory typically presumes. Even when confronted with relatively simple decisions, in which the objectives are unambiguous and the contraints fairly obvious, people do not always behave in a manner which is consistent with neoclassical economic theory. Indeed, once decision problems become rather complex, one faces the paradox that too much rationality is irrational, because it is far too costly in time and trouble to discover what decision really maximizes one's preferences, even if it is possible at all. Similarly, in their psychological experiments, Tversky and Kahneman (1981, 1986) in particular have shown how the outcome of a decision-making process can be systematically influenced by the way in which the decision problem is 'framed', just a line segment which is in fact shorter than another can be made to appear longer simply by attaching suitable arrows to each segment in order to suggest contraction or expansion, as appropriate. Yet a fundamental tenet of rational behavior – indeed, I would even claim that it is *the*

fundamental tenet – is precisely that the decision should be unaffected by the way in which the decision problem is framed. Rather, it should be determined solely as a function of the available consequences of each possible decision. I shall now argue why this casts considerable doubt on the applicability of consumer sovereignty to the market behavior of the boundedly rational consumers who certainly exist in the world, even if they do not in neoclassical economics.

Recall the role of the consumer sovereignty value judgment, which we discussed in the previous section. It is used to lend normative significance to Pareto-efficient allocations, which can then be categorized as ethically desirable. Now, I am willing to assert that any social norm should be 'consequentialist' in the sense that it should prescribe decisions based solely on the consequences of all the possible decisions – the 'fundamental tenet of rationality' was how I referred to this in the previous paragraph. This is actually a highly controversial assumption in moral philosophy, as can be inferred from the extensive critical discussion it has received, to which I refer to some extent in Hammond (1986a). No less controversial is the ethical doctrine of 'utilitarianism', which is actually rather stronger than consequentialism. Nevertheless, I am also willing to assert that most of the controversy arises because most of the critics of consequentialism in ethics have too narrow a concept of the relevant consequences in mind. Respect for individuals' rights, feelings of personal integrity, the wider acceptability of certain standards of behavior like truthfulness and honesty, even the effects of ethical education and of exemplary behavior on people's motives for behavior, are all rather subtle examples of consequences which, if they are ignored, leave consequentialism open to the kinds of troublesome examples which Williams (1973) in particular has drawn to our attention.

For consumer sovereignty to have the best possible chance of ethical acceptability, the social norm should obviously be based upon individual preferences. In particular, it must coincide exactly with individual preferences for those very special hypothetical societies in which it just so happens that all individuals are identical and one is choosing among economic allocations in which all consumers have equal amounts of every private good. But this coincidence is only possible, of course, if each individual's preferences just happen to be equal to the social norm of the 'clone' society in which everybody is identical to the given individual. So each individual's preferences must amount to a consequentialist 'individual norm', which is just a copy of the social norm for a particular clone society. Since consequentialism requires decisions always to maximize fully the individual's preference ordering over the set of all possible consequences, it is entirely inconsistent with bounded rationality. This explains formally what many will find intuitively obvious anyway – namely, that bounded rationality is inconsistent with consumer sovereignty.

Such inconsistency is troubling for those neoclassical economists who would like to claim that equilibrium allocations in complete, perfectly

competitive markets can give us the best of all possible worlds. But then they deserve to have such trouble, because they are looking for unbounded rationality in the choice of an economic system and of its resultant allocations, even when individuals are boundedly rational. The invisible hand can hardly be unboundedly rational when individuals are not. Critics of the invisible hand must be wary, however. They may well be tempted to claim that, because individual's market behavior is boundedly rational, markets should be replaced by planning mechanisms. The obvious disadvantage of this is that the rationality of those administering a planning mechanism is usually no less bounded than that of the typical market participant; indeed, as Hayek has often emphasized, because such administrators inevitably face enormously complex decision problems involving the handling of much more information than is relevant for the typical participant in competitive markets, their rationality is likely to be extremely circumscribed.

It is true that various forms of bounded rationality can have a significant impact on the nature of equilibrium outcomes, as has been pointed out recently for rather different economic environments by Akerlof and Yellen (1985a, b) and by Russell and Thaler (1985). Nevertheless, to me, bounded rationality on the part of economic agents is just one more kind of constraint to be taken into account in determining what economic allocations are truly feasible, let alone optimal. Since, as I shall argue in Section 10 below, first-best allocations are almost certainly unattainable anyway, and since market allocations have no very special claim to our attention either, the fact that economic agents may not always be maximizing fully what it would be best for them to maximize is not really a fundamental problem. Individual behavior effectively operates as a constraint on the set of truly feasible allocations. And full rationality is not an essential requirement for descriptive models of economic behavior, as Becker (1962) explained long ago.

Moreover, recognizing that agents may be boundedly rational has some useful implications which cannot emerge otherwise. In positive economics, we can account for the existence of all sorts of agencies and professional services which exist to give their clients advice on how to make better decisions. In normative economics, we can advocate the provision of public services such as the Citizens' Advice Bureau in Britain which offer free advice to those who can perhaps most benefit from it.

I conclude that, even though bounded rationality is inconsistent with consumer sovereignty, this is not really troublesome unless one is looking for an economic system which functions like an unboundedly rational invisible hand. Indeed, the arguments I have just given, for regarding unbounded rationality as an unnecessary assumption in properly done welfare analyses, apply equally to consumer sovereignty. The fact that consumers may not be behaving in the way that the ethical norm would prescribe simply serves as yet one more kind of constraint to be taken into account in our discussions of economic policy and their effects on economic allocations.

4 UNBOUNDED FORETHOUGHT

> Keynes brought back *time* into economic theory. He woke the Sleeping Princess from the long oblivion to which 'equilibrium' and 'perfect foresight' had condemned her and led her out into the world here and now.
>
> This release took economics a great stride forward, away from theology towards science; now it is no longer necessary for hypotheses to be framed in such a form that we know in advance that they will be disproved. Hypotheses relating to a world where human beings actually live, where they cannot know the future or undo the past, have at least in principle the possibility of being set out in testable form. (Robinson, 1962, pp.73–4)

The last section discussed unbounded rationality by a single agent acting in isolation in the world, however, there are many agents whose decisions interact with each other in an enormously complex fashion. Of course, one of the beauties of competitive markets in Walrasian equilibrium is precisely that the agents in the economy do not really have to know anything about each other at all. Each agent simply interacts with the Walrasian 'auctioneer' who learns the excess demand functions of all the agents and then adjusts prices through some kind of *tâtonnement* process in order to clear all markets. All the individual agent needs to know is the market clearing price vector set by the auctioneer.

An obvious problem with this approach is that the world does not contain any Walrasian auctioneers. The closest approximations we are ever likely to see are government appointed price controllers told to balance supply and demand, rather than their usual task of trying to hold back inflation, and market makers in security markets (see Howitt, 1979, pp.621–2; Glosten and Milgrom, 1985, and the papers cited in the latter). Even if there were a perfectly functioning auctioneer, however, the Walrasian model of the economy would still face enormous problems in realistic environments. The reason is that there can never be complete contingent commodity markets with perfect foresight, as so much of contemporary economic theory assumes. Even in abstract theory, such complete markets can really only function if all the agents in the economy are equally informed whenever markets are open. Otherwise, those traders who happen to be better informed will typically be able to exploit their superior information by suitable market transactions. As Milgrom and Stokey (1982) and Sebenius and Geanakoplos (1983) have recently shown formally, an agent facing an offer of a trade contingent upon an event about which he knows that he is less well informed than the person making the offer, will be rational to refuse that offer, unless he has different preferences which make the trade mutually beneficial anyway, or he believes that he has different prior as well as posterior beliefs concerning the probabilities of the various contingencies. But usually trading takes place sufficiently anonymously that one is never

sure whether a prospective trading partner has some privileged information, or if indeed he did start off with different prior beliefs. That is why insider trading in company shares (as discussed recently by Kyle (1985) in particular) needs to be prohibited if a stock market is to function 'perfectly', why in practice so many outsiders find it difficult to earn significant profits on stock exchanges, and why market makers on the stock exchange need to maintain bid prices below asking prices (Copeland and Galai, 1983; Glosten and Milgrom, 1985).

Private, or asymmetric, information also creates the problems of moral hazard and of adverse selection in insurance markets that have rightly received so much attention recently from economic theorists. And recent work by Mervyn King shows that share repurchases, as opposed to dividends, may suffer from similar problems – i.e., if management tries to spend the money it would have paid out as dividends in order to buy back equity, this may be misinterpreted as an indication that the firm's prospects have improved, so that the shares become too expensive to repurchase, and dividends are worthwhile after all, despite their tax disadvantages.

Indeed, once asymmetric or private information is admitted, trading must take place sequentially – it is impossible to have a single market for all contingent commodities for all time, as in Debreu (1959). One reason is that the unborn and others whose tastes are as yet not completely formed will find it very difficult to arrange or have arranged for them the pattern of taste-contingent demand they would like to have in Debreu complete contingent commodity markets. Another reason is that transaction costs are bound to limit the contingencies that can be covered in contingent commodity markets, as well as the number of periods in the future, etc. Either way, agents will try to foresee what prices will be in markets that are yet to open in the future.

In the seventies this problem of foreseeing the future was generally resolved by postulating perfect foresight concerning at least the mean, if not the entire probability distribution of market prices. Econometricians and macroeconomists tended to concentrate on linear-quadratic models with certainty equivalents in which foreseeing the mean of the distribution was good enough, in the tradition of Muth (1961). Microeconomists were more concerned about the whole probability distribution. If there are markets in Walrasian equilibrium and there is common information, this amounts to each agent foreseeing perfectly what prices will be in each exogenous state of the world, as in Radner's (1972) generalization of Arrow's (1953, 1964) work on contingent security markets. With private or asymmetric information *ex ante*, the microeconomists found serious problems in proving existence of equilibrium unless prices in equilibrium were so informative as to create common expectations *ex post*, after agents have learned what they can from the fact that the equilibrium price vector clears market demands and supplies. Thus all agents become fully informed in equilibrium. Notable

exceptions are such special models as Lucas (1972, 1983); Ausubel (1984), and those surveyed in Jordan and Radner (1982).

Thus, although the assumption of perfect foresight in the strict sense has been abandoned, because agents remain uncertain about the exogenous state of the world, surprisingly often there is no additional uncertainty arising from the economic system itself. For each possible history of exogenous events, the contingent history of market-clearing price vectors is often completely known. The only exceptions occur in connection with the partially revealing equilibria of Lucas, Ausubel and Jordan and Radner, as mentioned above. Notice that the 'sunspot equilibria' of Cass and Shell (1983) also have the feature that contingent prices are perfectly foreseen. Indeed, such equilibria were considered in order to try to explain how one can have speculative bubbles even with rational expectations. The novelty of these sunspot equilibria is that states of the world – such as sunspots – which have no bearing on the exogenous variables of the economy – such as tastes and technology – may nevertheless influence equilibrium prices and produce inefficient equilibria. The point is that everybody foresees precisely how equilibrium prices do depend on extrinsic events.

A presumption of almost all this literature on general equilibrium with uncertainty and incomplete markets is that eventually the state of the world is revealed to all agents in the market. If this were not true, it would be impossible to see how agents could ever learn how prices come to depend on the state of the world. A much more plausible assumption instead is that each agent only ever sees rather a small part of the whole picture of the economy. This leads to a weaker concept of equilibrium, in which agents' beliefs about how prices depend on their own information regarding the true state of the world are correct. In an economy whose history can be summarized at any moment of time by a (possibly very long) list of state variables describing the set of agents and their tastes, information, beliefs, holdings of physical and financial capital assets, one can then look for a 'Markov' Walrasian equilibrium in which prices at each moment of time are determined as functions of all the state variables. For this to be an equilibrium, not only do prices have to clear all markets in every possible state of the economy; in addition, agents must have correct beliefs about the Markov stochastic process relating their information at the end of any period to their information at the start of the same period.

Though I believe such Markov equilibria to be interesting and conceptually important, they remain almost entirely unexplored. In the small literature that there is, they have often gone under other names, such as 'self-generating distributions' (Shefrin, 1981) and 'recursive equilibria' (Prescott and Mehra, 1980). Shefrin drew his inspiration from Hahn (1973a) and the others from Lucas (1978). Shefrin has differing agents but a non-economic environment in which the set of possible states of the game is finite: Lucas, Prescott, Mehra and others only have results for Walrasian equilibrium when

there is a continuum of identical individuals, and the economy always performs optimally from the point of view of each individual. Spear (1985) has recently taken matters rather further, but we still lack a satisfactory existence theorem for Markov Walrasian equilibria, other than in very special cases. The difficulties of proving existence come about because the space of Markov price process is inherently infinite-dimensional, even in a two-class economy. To apply the usual kind of fixed-point theorem one has to be sure that demands and supplies are suitably continuous, and these are far from straightforward issues in an infinite-dimensional function space.

Such mathematical technicalities seem far removed indeed from realistic models of actual economic agents' rather incompletely formed view of the workings of the economy on which they base their expectations. They are also far removed from even the most sophisticated of the 'applied general equilibrium' models (Shoven and Whalley, 1984). The modelling problem has become so complicated that mathematical economists are only just getting around to demonstrating the possibility of the existence of an equilibrium. Yet equilibrium models of the economy presume implicitly that agents are much smarter than even the mathematical economists, because they are somehow able to learn and react to an immensely complex model of the economy, which includes as state variables everything which they might know something about – for example, the entire contents of both the *Financial Times* and the *Wall Street Journal*, all the economic statistics ever published, etc. At this stage it becomes impossible to regard such equilibrium models at all seriously. Even if they no longer involve perfect foresight, the notion of unbounded rationality considered for a single agent in Section 3 has extended itself to infinite-dimensional spaces in a form which I think should be called 'unbounded forethought'.

The above discussion has been concerned with Walrasian equilibrium, or the economics of perfect competition. Each agent needed only a model for predicting the sequence of observations he would make over time, including the prices he would be facing in any time period. Other individual agents are of no importance; it is only in the aggregate that they affect the prices faced by the single agent under consideration. That is an enormous simplification because it removes the possibilities for strategic interaction between different economic agents. Mathematically, each agent behaves as if he were in a game with a continuum of players, in which only the distribution of strategies chosen by the other players matters. When there is imperfect competition, strategic interaction does become important, of course, and has mostly been modelled in recent years using the theory of 'games', to use the terminology that has become standard since the work of von Neumann and Morgenstern. Yet even the word 'game' fails to convey the full complexity of the world in which economic agents must make their decisions. For, in real games, even enormously complex games like chess and go, each player knows a great deal about his opponent and about what that opponent must do in

order to try to win the game. Whereas, in real economies, it is far from clear who are the 'players' in the 'game', let alone what the objectives of these players really are.

All might still be well if we had an adequate theory of such games, at least for simple cases. Yet right now the theory of extensive form games is in a state of great turmoil, with even the notion of rational behavior appearing self-contradictory. For example, if a game like prisoner's dilemma is played an arbitrary finite number of times, the standard notion of rationality prescribes that each player should always confess, and never cooperate with the other player in the game. Yet the recent work of Axelrod (1981, 1984) shows the apparent superiority of playing a 'tit-for-tat' strategy, in which each player cooperates if and only if the other player cooperated the previous period. The interesting paradox is that, if it looks as though the other player is likely to continue playing tit-for-tat, then a player does best by playing tit-for-tat right up to near the end of the game. But then it becomes 'rational', in a sense that is still unclear, for that other player to play the strategy that was originally irrational, because it may well convince the first player to play tit-for-tat. The analysis has already gone far beyond the work of Kreps, Milgrom, Roberts, and Wilson (1982) but has not yet reached anything like a final resting place. The very concept of rationality has become extremely unclear (see also Campbell and Sowden, eds., 1985) and so has placed the foundations of equilibrium theory upon extremely shaky ground.

5 UNBOUNDED COOPERATION

> Then consider the notorious problem of pollution. Here again the economists should have been forewarned. The distinction that Pigou made between private costs and social costs was presented by him as an exception to the benevolent rule of *laissez faire* . . . The economists were the last to realize what is going on and when they did recognize it they managed to hush it up again. *Laissez faire* and consumer's sovereignty were still absolute except for a few minor points discussed under the heading of 'externalities' that could easily be put right. (Robinson, 1972, p.7)

In Section 2 mention has already been made of how externalities limit the scope of consumer sovereignty. For, in the presence of externalities – be they external economies or diseconomies – consumers pursue goals which are inconsistent with Pareto efficiency, and they could be better off as a whole if their freedom to create external diseconomies, and their freedom not to create external economies, could somehow be limited. So much can be learned even from elementary economics. Externalities, in fact, undermine

the conclusions of both the fundamental efficiency theorems. The first theorem becomes invalid because, in the absence of suitable markets for the creation of external effects, competitive markets do not generally bring about Pareto-efficient allocations. Private costs and benefits, which ignore external effects, differ at the margin from social costs and benefits, which do include such effects. Similarly, the second efficiency theorem also fails. Unless special markets are created to encourage the creation of external economies and to deter the nuisance of external diseconomies, no competitive market system can possibly bring about a given Pareto-efficient allocation, in general.

Such is the theory of how externalities undermine the effectiveness of a perfectly competitive market system as a good allocator of economic resources. There is also the practical experience we share of acid rain, smog, leaded fuel, noisy airports, and the other forms of pollution which industrial society inflicts upon our bodies, our minds, our personal property, and even our public monuments. Yet, despite the clear evidence around us, there remain all too many governments and their economic advisers who seem to think that externalities can be safely ignored.

To be able to ignore externalities in a way that their masters in business and even in government find most convenient, *laissez faire* conservative economists need to be able to blind themselves with a suitable theory. Demestz (1967) and Buchanan and Stubblebine (1962) were able to find one for them to use, based upon a theory of property rights. The 'Coase (1960) theorem' showed that Pigou taxes or subsidies on externalities were equivalent to an assignment of property rights, and that, in the presence of transactions costs, some assignments of property rights could be more efficient than others. Then the property rights doctrine, as it is usually called, is formulated to claim that, when several parties find themselves imposing external economies on each other, or failing to create external economies for their mutual benefit, the resulting Pareto inefficiency can be resolved by having the interacting parties come together and agree how best to create property rights governing the external effects, so that the divergence between marginal private benefits and costs and marginal social benefits and costs gets removed. Thus the fundamental efficiency theorems have their validity restored. Such mutual arrangements will indeed lead to Pareto-efficient outcomes, so that externalities can be ignored. Even if such mutual arrangements prove to be impossible, because of legal obstacles (which should anyway be done away with, according to this doctrine) or because of transactions costs or limited information, then *laissez faire* still gives rise to constrained Pareto-efficient allocations, in the sense that no truly feasible allocation which respects the legal obstacles and does not make use of information that is unavailable can possibly be Pareto superior. Really, then, the property rights doctrine is merely a special case, dealing with externalities, of what I like to call the 'efficiency tautology'. This assumes that any feasible Pareto improvement in institutional arrangements will always be

found, and then claims that the economic allocation which actually results must be Pareto efficient!

In fact, for defenders of *laissez faire* who are also satisfied with Pareto efficiency as a sufficient condition for ethical acceptability, despite the faults with Assumptions 6 and 7 discussed below, the efficiency tautology is a marvellous result. It guarantees Pareto efficiency, because if there were a way to find a Pareto improvement, it would already have been found! This is unbounded rationality *par excellence*, applied not only to single individuals but also to groups of possibly arbitrarily large size. A similar objection applies, of course, to the core, when unrestricted coalition formation is postulated as it usually is. Indeed, since core allocations must be Pareto efficient, when they exist, the core has also been a useful refuge for those whose ethical sensibilities have not progressed beyond the sufficiency of Pareto efficiency.

The last three sections have discussed how the neoclassical theory of economic equilibrium presumes an absurd degree of ability among economic agents. Of course, it is very comforting to be able to believe that all agents are so rational, so full of forethought, and so ready, able, and willing to cooperate, that between them they produce the best of all possible economic worlds. It is high time that the most outrageous of these assertions started to be relaxed. Individuals are bounded in their rationality, their foresight, and their ability to cooperate. Recognizing these patently obvious facts would allow us economists to work with a picture of the world in which we are not useless, because we can surely teach people how to make decisions which display more rationality, more forethought, and more cooperation.

This is not to suggest that equilibrium models should be entirely abandoned. Indeed, our objections have almost nothing to do with the concept of equilibrium *per se*. It still makes perfect sense to look for an equilibrium of supply and demand in the economy. Rather, it is the interpretation of the demand and supply functions which changes. One no longer pretends that demands and supplies are truly those which maximize the correctly perceived objectives of each private agent in the economy. As the young Becker (1962) realized, for one, equilibrium theory does *not* require the behavioral assumption of maximization, let alone unbounded rationality, or unbounded forethought.

So, the *concept* of equilibrium does not require any kind of rationality or forethought. But when it comes to matters of *normative interpretation* it is true, of course, that equilibrium models need to heed the bounded rationality and the bounded forethought of any human being, even the smartest of the mathematical economists. It appears that one needs to describe each agent in the economy not only by his tastes and his feasible set, but also by the simplified model of the world which he will use to reach his decisions. The existing models of economic decision making are as if every agent has enough rationality and forethought to be able to play games like chess perfectly. Yet

even existing computers play chess rather imperfectly by grandmaster standards. On the other hand, if one wanted to simulate how most inexpert players actually play, most existing chess programs are far too good at avoiding blunders leading to checkmate in two moves or to the early loss of a valuable piece. Many economic decisions in real life, however, have many of the characteristics of a blunder in a game of chess, and predictive models which neglect this lead to normative conclusions which are fundamentally flawed. Even if such models happen to predict the aggregate level of measured unemployment fairly well, for example, they completely miss the fact that many of the unemployed are not very good at searching systematically for a job. Indeed, if they were, that in itself would be a skill that would qualify them for a much wider range of employment opportunities. The neglect of their limited ability to find suitable jobs leads too easily to the false normative conclusion that people are unemployed because they have a preference for leisure – or, less euphemistically, because they are lazy. Kay and King (1978, p.108) make a similar point concerning the tax system when they write, 'It is worth bearing in mind that one reason the poor are poor is that they are not qualified as chartered accountants.'

At least the recent paper by Russell and Thaler (1985) is a step in the right direction. So is the earlier paper by Myerson (1983), even though it presumes an unbounded ability to formulate and solve appropriate linear programs; there is bounded forethought, however.

6 PARETO EFFICIENCY IS SUFFICIENT FOR ETHICAL ACCEPTABILITY

> In this diminished kingdom [of Keynes's *General Theory*] *laisser faire* can still flourish; from this ground it can make sallies to recapture lost territory. It is this rallying of the old ideological forces round their oriflamme – the optimum distribution of resources in long period equilibrium – that accounts for the slow progress that has been made in bringing the so-called theory of Value and Distribution into touch with historic time and the so-called theory of Welfare into touch with human life. (Robinson, 1962, p.82)

The two fundamental efficiency theorems of welfare economics characterize Pareto-efficient allocations as those which emerge from perfectly functioning complete competitive markets in general equilibrium. Assumptions 2 and 3 – consumer sovereignty and unbounded rationality – are used in order to give Pareto-efficient allocations ethical significance, and so make these two fundamental theorems into ethical justifications of free market allocations. There is still a major obstacle to such a justification, however, which also relates to the difference between the first and the second efficiency theorems.

It is the second theorem that tells us that virtually *any* Pareto-efficient allocation is a possible outcome of perfectly competitive markets in general equilibrium. But there is a most important proviso in the statement of the theorem; achieving any particular Pareto-efficient allocation generally requires redistribution of purchasing power through lump-sum taxes or subsidies, so that the distribution of wealth allows that allocation to occur in equilibrium. Whereas the first efficiency theorem says that a perfectly competitive equilibrium allocation is Pareto efficient regardless of the distribution of income.

Despite the elementary distinction between the two results, they often get confused in a way that happens to be convenient for defenders of *laissez faire* and of the *status quo*. Such defenders love to appeal to the first efficiency theorem in order to assert that we should remove all distortionary taxes and other obstacles to perfectly competitive allocations. They are much more vociferous in their advocacy of free markets than they are in recognizing that removing, for example, welfare benefits financed by distortionary taxes, is likely to hit hard the poorest members of a society who, almost by definition, are least able to prosper in a competitive economic environment. It is true that a move to perfectly competitive markets without distortions will pass the kind of compensation test originally devised by Barone, but more usually attributed to Kaldor and Hicks. But there is no Pareto improvement unless compensation is *actually paid* to those adversely affected by the winds of increased competition. In the absence of such compensation, the gains of some groups must be balanced against the losses of others. Since there are some fundamental difficulties in paying suitable compensation, as will be seen in Sections 10 and 11 below, the case for *laissez faire* remains seriously and fundamentally incomplete.

In fact, as soon as one is concerned about the ethics of income distribution, the first efficiency theorem is stripped of its ethical significance. There is no guarantee whatsoever that *laissez faire* will produce a just distribution of income, or even one that avoids very gross injustice, in which some people barely subsist in abject poverty, while others are extremely affluent. Indeed, both market and Pareto-efficient allocations can be even worse than that, because it is quite possible for both to be consistent with widespread starvation, as I shall discuss in the next section. Pareto efficiency is *not* sufficient for ethical acceptability, even though many defenders of *laissez faire* may want to claim, at least implicitly, that it is. Nor is the first efficiency theorem really of any ethical significance either. Instead, it is the *second* efficiency theorem that has some claim to ethical significance, because it characterizes *any* Pareto efficient allocation – in particular, any Pareto-efficient allocation with an ethically acceptable distribution of income.

As Joan Robinson (1949, and 1951a, p.173) wrote in her review of Harrod's *Dynamic Economics*: 'to discuss either the distribution of income or measures to increase useful investment brings politics into the economic

argument. But [there] is no way to keep politics out. [The] resolution to avoid these questions is itself a political decision.'

7 THE DISTRIBUTION OF WEALTH IS ETHICALLY ACCEPTABLE

> All but a few fanatics admit that the overall amount of saving (at full-capacity operation of the economy) depends upon the distribution of wealth and income within society and upon the policy of firms in respect to withholding profits for self-finance. To represent the corresponding rate of accumulation as that 'desired by society', it is first necessary to show that the existing distribution of wealth is desirable; this is the question, of all others, that *laissez-faire* ideology is least anxious to discuss. Robinson (1965, p.142)

Assumption 6 amounts to the irrelevance of the distribution of wealth; Pareto sufficiency on its own is sufficient for ethical acceptability. Here, I consider an assumption which, while formally weaker, nevertheless rules out any further discussion of inequality or poverty in the economy. This is the assumption that, while the distribution of wealth is a matter of legitimate ethical concern, it is beyond the scope of economic policy to do anything to improve it. In particular, it is commonly assumed that wealth distribution has already been optimized by a system of suitable lump-sum taxes and subsidies. Such an assumption seems patently absurd in a world plagued by poverty, hunger, and mass unemployment. Yet the assumption of an optimal wealth distribution certainly played a prominent role in the theoretical work of Samuelson and others during the 1950s.

One's first reaction might be that, since the existing wealth distribution reflects the values of the society, it must be at least ethically acceptable, if not optimal. The allocation and distribution of resources in the economy are supposed to reflect the 'revealed preference' of government, an idea which may hark back to Pareto (1913, p.340; see Bergson, 1983, p.42). Yet I know of no government in the world that is choosing its policies very systematically, let alone anything like optimally. If I thought *that*, there would be nothing left to discuss in welfare economics, or almost any other kind of economics. Of course, it may well be true that what the welfare economist regards as 'optimal' is unattainable, although then one must question whether the true constraints on optimal policy have been properly recognized. We shall not be able to improve economic policy by throwing up our hands at the difficulties – political and otherwise – in making worthwhile changes. That is a counsel of despair which, if we are not very careful, will prevent us from trying to do anything about the pressing problems of poverty and inequality in the world economy as it stands now. Before

knowing whether what we actually have is ethically acceptable, we have to consider what alternatives are feasible. Otherwise we are taking the attitude described by Joan Robinson's (1962, p.130) memorable phrase, 'our system is the best system that we have got'. Such complacency enables one simply to sit back and admire the optimally functioning economy, just as *laissez faire* economists want us to be able to sit back and observe the 'invisible' hand working its magic.

Closely related to assuming ethical acceptability of the distribution of income or wealth is the adoption of aggregate wealth maximization as an ethical criterion. (See especially the work of Posner (1981), reviewed in Hammond (1982).) Aggregate wealth maximization means adding up money-metric measures of utility over the whole population, and maximizing the sum total of everybody's dollars without any regard to the ethical desirability of weighting the dollars of the very poor more highly (or more lowly, for that matter, if one's ethical values are very inegalitarian) than those of the rich. It involves very special – and especially obnoxious – distributional value judgments. It is true that when the distribution of wealth happens to be fully optimal, all individuals' dollars have equal social value at the margin. For, if they did not, the distribution of wealth could have been improved by lump-sum transfers of wealth from those individuals whose dollars have low marginal social value to those whose dollars have high marginal social value, until the marginal values of all individuals' dollars are indeed equalized. Then aggregate wealth maximization is a first order approximation to the social welfare function in the neighborhood of the initial point at which the distribution of wealth has been optimized. Only in this case do I see any ethical justification for aggregate wealth maximization, and it is clear to me that this is not an accurate description of the world economy in which we now find ourselves.

Indeed, there are good theoretical reasons why, even if a national or world government really were maximizing society's values using the economic policy instruments it has available, the distribution of wealth might well still not be optimal, because those policy instruments are insufficiently powerful to redistribute wealth perfectly. In Section 10 below, I am going to argue that this is generally the case. Then, of course, it is somewhat harder to argue that the current unequal wealth distribution is ethically unacceptable, because the scope for redistributive policy is less. Clearly, however, the argument of the previous paragraph for equality of the marginal social value of all individuals' dollars has fallen apart completely, so that unweighted aggregate wealth maximization is no longer even an approximation to an ethically satisfactory objective of economic policy. Since most economists – let alone policy makers – appear not to understand the economic theory which is relevant to this issue, and since there is manifest poverty and injustice in the world, this leaves enlightened economists above all with the task of applying expertise toward trying to identify feasible policies which really can improve

wealth distribution, rather than just looking for policies to increase total wealth. The concluding paragraphs of Joan Robinson's *Economic Philosophy* and of her *Economic Heresies* both serve to summarize where we now stand:

> The first essential for economists, arguing among themselves, is to 'try very seriously', as Professor Popper says that natural scientists do, 'to avoid talking at cross purposes' and, addressing the world, reading their own doctrines aright, to combat, not foster the ideology which pretends that values which can be measured in terms of money are the only ones that ought to count. (Robinson, 1962, p.137)

> National economic success is identified with statistical GNP. No questions are asked about the content of production . . . [M]odern capitalism . . . has not succeeded in helping (to say the least) to promote development in the Third World. Now we are told that it is in the course of making the planet uninhabitable even in peacetime.
>
> It should be the duty of economists to do their best to enlighten the public about the economic aspects of these menacing problems. They are impeded by a theoretical scheme which (with whatever reservations and exceptions) represents the capitalist world as a kibbutz operated in a perfectly enlightened manner to maximize the welfare of all its members. (Robinson, 1971, pp.143–44)

8 CONSUMERS CAN SURVIVE WITHOUT TRADE

> A good deal of present-day discussion of international trade seems to be based on the notion that there always is a position of equilibrium to be found by relying upon the operation of the pricing system, and it is necessary to recognize that the classical doctrine does not exclude starvation from the mechanism by which equilibrium tends to be established. (Robinson, 1946, and 1951a, p.189)

Most professional economists will be willing to admit, perhaps rather reluctantly, that Pareto efficiency is indeed insufficient for ethical acceptability in the absence of a just income distribution. But as Sen (1981b) has pointed out, almost all of general equilibrium theory assumes that every individual consumer has the means to survive without trade. More specifically, almost all of general equilibrium theory assumes that every consumer has a fixed endowment vector of commodities which lies within his feasible consumption set. Indeed, to guarantee the appropriate continuity of demand functions – or, more generally, of set-valued demand correspondences – as required for proving existence of a Walrasian equilibrium, it is usual to assume that the endowment vector lies in the *interior* of the consumption set,

for each consumer. In more general models, where consumers are endowed not with a fixed vector of commodities but with a production possibility set, as in Rader (1964) and Coles and Hammond (1986), one assumes that the consumption and production sets of the agent intersect – or, to ensure continuity of net trade functions – that their intersection has a non-empty interior.

In all cases, then, the standard assumption of general equilibrium theory is that each consumer certainly has the means to survive without trade. Since trading opportunities enhance the consumer's feasible set, it then follows that no rational consumer can ever be pushed below the margin of survival involuntarily, except by a heavy poll tax or some other form of taxation based upon the consumer's endowment. So the possibility of the very poor starving in a world of plentiful aggregate food supplies is virtually excluded by assumption. Yet Sen (1977, 1981a,b) has provided much evidence to show that famine is in fact more often due to gross inequality of income than it is to the total food supply falling so low that it becomes impossible to feed all the population adequately.

Walrasian equilibrium without survival presents a number of technical problems, as discussed in Coles and Hammond (1986). For example, both existence of equilibrium and the second efficiency theorem of welfare economics rely on convexity of individuals' preferences and of their feasible sets. When the survival of individual consumers is at issue, the number of survivors becomes an endogenous discrete variable, leading to fundamental non-convexities. To prove results which correspond to the standard existence and efficiency theorems, we had to obtain convexity by smoothing over a continuum of individuals, using the techniques pioneered by Aumann (1964, 1966) and Hildenbrand (1974). Then the proportion of individuals who survive becomes the relevant variable, and that of course is a continuous variable in a continuum economy.

So the possibility of non-survival places no fundamental obstacle in the way of the usual efficiency, existence, and core equivalence theorems. In particular, competitive equilibria can occur with a large proportion of the population below the margin of survival. Such equilibria are even Pareto efficient, because feeding the starving would require sacrifices from some of those whose survival is not at risk. Really, that mass starvation can occur in competitive equilibrium, and still be consistent with Pareto efficiency, merely serves to dramatize the criticism of Assumptions 6 and 7 – namely, that Pareto efficiency is by no means a sufficient condition for ethical acceptability, and there is also no good reason to presume that the distribution of wealth is ethically acceptable within any one country, let alone within the whole world. Moreover, one should hardly need to add that when some individuals are at or even below the margin of survival, aggregate wealth maximization is rather obviously an unethical criterion for the choice of economic policy. Indeed, as Joan Robinson herself wrote:

> that the form of investment is controlled by the principle of maximizing the welfare of society, is being discredited by the awakening of public opinion to the persistence of poverty – even hunger – in the wealthiest nations, the decay of cities, the pollution of environment, the manipulation of demand by salesmanship, the vested interests in war, not to mention the still more shocking problems of the world outside the prosperous industrial economies. The complacency of neo-*laisser faire* cuts the economists off from discussing the economic problems of today just as Say's Law cut them off from discussing unemployment in the world slump. (Robinson, 1971, pp.xiv–xv)

> These problems arise in the economies that boast of their wealth. Perhaps they can afford the luxury of an economics profession that builds intricate theories in the air that have no contact with reality. But this luxury is too expensive for the so-called developing world where the doctrines of *laissez faire* and the free play of market forces are exported along with armaments to keep them from looking for any way out of their infinitely more grievous situation. (Robinson, 1972, pp.7–8)

9 INCOME EFFECTS ARE NEGLIGIBLE

> With every pair of hands God sends a mouth, but a mouth without a shilling to buy bread does not constitute a market. (Robinson, 1951a, pp.115–6)

In Section 7, it was seen that aggregate maximization is a valid approximate welfare criterion in the special case when the distribution of wealth has been optimized, but is unjustified otherwise, in general. Nevertheless, the assumption remains in common use in elementary textbook treatments of welfare issues, based on partial equilibrium analysis. There it ties in closely with another dubious assumption, which is that all income – or wealth – effects can be neglected, and so welfare can be measured as the sum of total Marshallian consumer surplus together with total net expenditure on all other goods. It happens to be very convenient for these partial analyses that surplus can then be measured simply by looking at the area to the left of an aggregate demand curve, and then adding the consumer's expanditure on all other goods.

The general condition for a measure of Marshallian consumer surplus to be a well-defined line integral – to be 'path-independent' – requires homothetic preferences for the goods whose prices are changing, and income elasticities of demand for these goods all equal. The condition for Marshallian consumer surplus to give an exact measure of welfare is even more stringent and should be well known; namely, the income elasticities of

demand for all goods whose prices are varying must be zero. Yet, since the time of Engel, if not earlier, economists have known a great deal about income elasticities of demand, and known that many differ substantially from zero. Indeed, the budget identity tells us that the wealth share weighted average income elasticity of demand is equal to one, and so there are bound to be some goods with income elasticities not only significantly positive, but greater than one – except, that is, in the special case of homothetic preferences for all goods, where all income elasticities are equal to one.

The elementary and intermediate textbooks no doubt ignore income effects and use Marshallian consumer surplus because many of their writers have never learned better, or because they are unwilling to face the task of explaining to students how to construct 'artificial' compensated demand curves which do allow for income effects. Even more advanced texts make similar excuses, however, claiming that compensated demand curves are 'unobservable', whereas Marshallian uncompensated demand curves are supposed somehow to be 'observable'. This despite the fact that, as far as I know, demand curves – be they uncompensated or compensated – are only observed within the pages of economics textbooks. What we actually observe in the world are prices, quantities, incomes, etc. and it is the task of the econometrician to estimate market demand functions. Any satisfactory estimation procedure has to overcome the standard identification problem of disentangling demand from supply. One possible approach is to assume that the demand curve has been fixed throughout and that all changes in prices and quantities are entirely due to shifts in supply. Generally, however, except in the special case when the income elasticity of demand is zero and so Marshallian consumer surplus is an accurate measure, one knows that the demand curve has also been shifting in response to income changes, if not to changes in the prices of complements and substitutes. Then one cannot solve the identification problem satisfactorily without including aggregate income – or, even better, the distribution of income – within the demand equation. An obvious implication is that it is virtually impossible to estimate price elasticities of demand without simultaneously estimating income elasticities of demand. Then the standard Slutsky equation can easily be used to calculate the compensated elasticity of demand. So the claim that uncompensated demand curves are somehow easier to observe than compensated demand curves becomes very difficult to substantiate outside the mythical world of economics textbooks which seem to presume that uncompensated demand curves are given to us as data.

Textbook sloppiness is one thing, but journal articles in applied economics also abound with what I am tempted to call 'surplus economics' masquerading as applied welfare economics. Some progress is being made, however, because now many writers do understand that using surplus to measure welfare is a mistake. However, they usually proceed almost immediately to excuse themselves on the grounds that surplus is a good approximation to an

accurate measure of welfare. The excuse is accompanied by a ritual reference to Willig (1976), conveniently overlooking the articles by Markandya (1978) and Hausman (1981) which point to the possibility of serious inaccuracies in Marshallian consumer surplus approximations. Less forgivably, nobody I am aware of – except the above-mentioned authors – has yet cared to provide an estimate of just how inaccurate the surplus approximation is for the particular application they are considering. The easy road of ignoring income effects altogether is the one usually taken.

Many theoretical results in partial equilibrium welfare analysis are admittedly very much easier when income effects are neglected and so the partial equilibrium is known to maximize total Marshallian consumer surplus. Correcting surplus calculations for income effects brings one face to face with the inconvenient need to discuss the distribution of income in the economy. The reason is that, except in the very special Gorman (1953, 1976) case when all individuals have parallel linear Engel curves relating expenditure on the goods in question to income, total demand depends upon the distribution of income. A special case of this, of course, is when all Engel curves are horizontal straight lines, which is what is required to make Marshallian consumer surplus an exact measure of welfare. Sometimes, however, one wonders if failing to make the correction is due merely to the desire to avoid extra algebra, or whether it is rather due to the wish that the income distribution could be ignored lest its consideration should make evident the unreasonableness of aggregate wealth maximization as the ethical criterion underlying total surplus maximization.

It would be wrong to end this section without due acknowledgment that there is also much recent work which does properly account for income effects in making estimates of welfare gains and losses. Particular examples are King (1983) and many recent articles by Jorgenson and his colleagues.

10 PARETO EFFICIENCY IS NECESSARY FOR ETHICAL ACCEPTABILITY

> In its own day, however, the neo-classical scheme was rather barren of results . . . There was a twofold reason I think for this sterility.
>
> First, the questions being discussed were of no practical importance. The policy recommended was *laisser faire*, and there was no need to describe in detail how to do nothing . . .
>
> The second reason why the neo-classicals were so much isolated from practice was the dominance of the concept of equilibrium in the theory itself . . . The soothing harmonies of equilibrium supported *laisser faire* ideology and the elaboration of the argument kept us all too busy to have any time for dangerous thoughts. Robinson (1962, pp.68–70 *passim*)

The last four Assumptions have concerned the distribution of wealth, and how one should not presume, as far too many economists seem to do in at least some of their work, that this distribution is no matter for ethical concern, either because it has already been made acceptable, or because wealth distribution is not a legitimate concern of economists. If these extraordinary assertions were valid, they would provide a good case for *laissez faire*, which may be why they retain their popularity. Fortunately, many economists, especially those who work in public finance and related areas, now do recognize that income distribution matters and that it is imperfect. So the first efficiency theorem of welfare economics loses its force because, although complete and perfectly competitive markets will bring about a Pareto-efficient allocation, they do not guarantee an ethically acceptable distribution of wealth. Indeed, the experience of real economies suggests rather strongly that an unacceptable distribution of wealth is all that free markets can guarantee.

One last assumption is often used to defend *laissez faire*. It is based on the second efficiency theorem of welfare economics. This, remember, tells us that, under conditions discussed in Section 2 (as well as many standard textbooks, of course), any welfare optimum can be achieved through equilibrium in perfectly competitive complete markets provided that the distribution of wealth is made ethically acceptable through appropriate lump-sum redistribution.

After my arguments in the last four sections, the reader should be in no doubt that I regard the proviso concerning redistribution of wealth to be extremely important. Yet, as many economists are willing to admit, we do not see enough redistribution in the world around us. One reason may be that we cannot agree what would be an optimal redistribution. Indeed, such lack of agreement is undeniable, but there are instances of redistribution that almost everybody can agree are ethically desirable, such as the alleviation of extreme poverty by taxes levied on those most able to afford to pay them. So why do they not occur?

The problem with the lump-sum redistribution which the second efficiency theorem of welfare economics requires for its ethical significance is that it is not really feasible. Any redistribution scheme is bound to affect incentives. Hahn (1973b) did once remind us of the differential lump-sum taxes which used to be levied on different classes of the English nobility, but such taxes must have affected somewhat decisions regarding what type of noble a person wanted to become, if any. Current proposals for the reform of local taxes in Britain involve a reversion to poll taxes, in effect. But if these vary between different local authorities, they will affect taxpayers' choices of the area in which to live. Even uniform poll taxes and subsidies are clearly likely to affect incentives governing the family planning decisions of prospective parents with sufficient forethought. True lump-sum taxes must be levied on

the basis of individuals' fundamental and unalterable characteristics, and not be based on decisions by those individuals. Such characteristics are usually private information to the person possessing those characteristics, even if we understand clearly what precise kind of characteristic it is that we are looking for. To the extent that a personal characteristic, like how much support an apparently very poorly endowed person might need to survive, remains private information, individuals will always be tempted to exploit that privacy by claiming to need more support than would be the truth. On the other hand, those who are truly well endowed are also likely to conceal their true endowments in order to escape paying too high a 'lump-sum' tax, based on their apparent taxable capacity. Indeed, the latter kind of manipulation by those who are really very well endowed is presumably rather more likely, because more skilled individuals are likely to understand better how to exploit the system.

Anyway, it is clear that differential 'lump-sum' taxes based upon apparent taxable capacity are not really lump-sum taxes at all, because taxpayers will tend to adjust their economic circumstances in order to reduce their tax liability. Yet it is precisely such differential lump-sum taxation that is needed in order to give ethical significance to the second efficiency theorem of welfare economics. In the jargon of the times, one says that differential lump-sum taxation is generally 'incentive incompatible'. The work of Hurwicz and Schmeidler (1978), Hurwicz (1979), Schmeidler (1982), among others, showed that among all Pareto-efficient allocations, only the Walrasian allocations without differential lump-sum taxes can be implemented by some incentive compatible mechanism. For the important special case of symmetric allocations (in which identical consumers are treated equally) in a continuum economy, one can also characterize incentive allocations as those which correspond to 'public finance mechanisms' with various kinds of commodity and income taxation, non-linear pricing, etc. This is formally stated and proved in Hammond (1979, 1987) and discussed much less formally in Hammond (1985). The conclusions of Hurwicz and Schmeidler on the incentive incompatibility of differential lump-sum taxation become reinforced, especially when free trade in an underground economy cannot be prevented. Really, all this just formalizes what Lerner (1947) and Graaff (1957) were already well on the way to understanding in their discussions of the difficulties of achieving fully optimal economic allocations.

This work changes the nature of welfare economics rather drastically, by showing that most of the Pareto-efficient allocations, considered in the second efficiency theorem of welfare economics, are not really feasible once one allows for the incentive constraints that arise because individuals' characteristics are, at least in part, private information. Indeed, the only Pareto-efficient allocations which are truly feasible in general economic environments are those which can be brought about by complete markets in perfectly competitive equilibrium without any differential lump-sum taxes

which depend upon individuals' private information. In the case when nothing is known about individuals' characteristics in an exchange economy, and if there is a unique Walrasian equilibrium in this exchange economy, then this unique equilibrium allocation is the only truly feasible Pareto-efficient allocation. If, in addition, it is impossible to prevent trade on perfectly competitive underground markets, then in this case there is precisely one truly feasible allocation, which is the unique Walrasian equilibrium. Thus markets emerge as constraints upon rather than the instruments of economic policy. It relates to the only 'important advantage of the free-market pricing system' which Joan Robinson described in her paper on 'The Philosophy of Prices':

> The advantage is that each family, within the limits of the purchasing power provided by its own production, can purchase whatever it pleases and each family is led to specialize upon what it can best produce. No one has to be ordered to do anything and there is no need for any allocation or rationing. Where there are no laws there are no crimes. The system polices itself. (Robinson, 1960, p.31)

Later, in summarizing the main conclusion of this paper for the collection *Contributions to Modern Economics*, she put it even better:

> I never could understand the claim that the free play of market forces establishes an optimum pattern of prices, but discussions with Polish and Soviet economists made me realize that there are very great merits in a system of prices for consumer goods in which flows of demand for particular goods are in line with available supplies. Distribution according to queuing power is no more just and much more wasteful than distribution according to purchasing power, and it moreover invites corruption. (Robinson, 1979b, p.xx)

Ironically enough, according to Jaffé's (1977) interpretation, Walras himself may even have intended his description of a perfectly competitive economy to represent the best that was possible in the economy subject to a rather unusual form of 'justice' in the sense that all traders face identical prices. This relates to Schmeidler and Vind's (1972) notion of 'fair net trades', which are Pareto efficient subject to the constraint that nobody could be better off with another agent's net trade vector, and must coincide with Walrasian equilibrium net trades.

As Graaff (1957) for one certainly realized, this inability to redistribute wealth or to control markets in the underground economy makes the usual concept of Pareto efficiency quite redundant in general. The usual concept involves a kind of 'first best' in which the only constraints on the choice of an economic allocation are the physical feasibility and resource balance con-

straints. Private information imposes additional incentive constraints, and so the appropriate concept of Pareto efficiency is a kind of 'second best' which respects these extra constraints. Moreover, these constraints appear much more natural than those considered by Meade (1955) and by Lipsey and Lancaster (1956) in their work on the second best. Indeed, they are so natural that Maskin (1980) for one regards an incentive constrained optimum as really a 'first best' allocation.

This, then, finally robs the second efficiency theorem of just about all its ethical significance. The theorem characterizes only those allocations that are first best Pareto efficient, when one ignores the incentive constraints. Most of the allocations which it characterizes are not truly feasible once the force of these incentive constraints is recognized. Generally, when some degree of public intervention in the economy is possible, there is no such simple characterization of second best Pareto-efficient allocations – i.e. allocations which are Pareto efficient among those that satisfy the various kinds of incentive constraints. In particular, there is now no justification whatsoever for continuing to claim that only *laissez faire* economic policies are worthy of consideration. Nor for restricting attention to the set of allocations which happen both to satisfy the incentive constraints and also to be first best Pareto efficient, since they will typically exclude most of the allocations which are second best Pareto efficient. Hence the title of this section; first best Pareto efficiency is not a necessary condition for ethical acceptability, except in those rare cases where the second best optimal allocation happens also to be first best Pareto efficient. It is true that such cases are not impossible; one occurs for instance in Dasgupta and Hammond (1980), but I regard that as a special example which suggests the possibility of more powerful forms of redistributive taxation, rather than as a case which is likely to occur in any actual economy.

11 THERE IS A REPRESENTATIVE CONSUMER

> There is no treatment at all of the determination of the distribution of income in orthodox teaching, and precious little about its consequences. What to the general public appears one of the most interesting of all questions in economics is simply left out of the syllabus. Robinson (1985, p.160)

So concern with the distribution of income, together with incentive constraints which limit its redistribution, undermine much of the standard work in welfare economics and public finance. Even so, the issues raised in the previous sections are avoided surprisingly often. In particular, a large amount of work, both theoretical and empirical, is based upon the assumption that there exists a single representative consumer.

Obviously, this is a common assumption in macroeconomics, where I would argue that it causes much of the trouble macroeconomists seem to have both with microeconomic foundations and indeed with finding any predictive model of an economy which outperforms the vector autoregressive techniques used by Sims (1980) and others. In principle such techniques often have no theoretical economic content whatsoever beyond the choice of variables to include in the vector autoregression. Moreover, it is quite unforgivable of certain macroeconomists to claim that they are considering models of 'maximizing' economic *agents* and then to proceed to consider economies which are indistinguishable from those with one single 'representative' maximizing *agent*. After all, it is now over thirty years since Gorman (1953) first pointed out the very restrictive conditions that need to be satisfied for a representative consumer to exist – namely that, for each good, all consumers' Engel curves must be parallel straight lines. Things may be changing, however, because now authors like Stoker (1986) have taken the trouble to test the representative consumer model in macroeconomics, and not surprisingly they were able to reject it. Indeed, the model fails the kind of direct test based on the weak axiom of revealed preference, as discussed by Deaton (1986).

The popularity of single consumer models in macroeconomics has had a strange side-effect. If there were *really* a single immortal (presumably) representative consumer, economics would become pretty trivial and uninteresting. In particular, any economic fluctuations would have to be wobbles desired by this one consumer. So, in order to have interesting dynamics, macroeconomists have taken to misusing the overlapping generations model which Samuelson (1958) originally developed in order to explain the usefulness of very long-lived financial assets, and how money can have a positive value which would be illogical in any finite time horizon economy (Gale, 1982). Now each generation is represented by a single consumer, but two or three generations co-exist in any time period. This may be an interesting model of the very long-run dynamics, but can hardly be taken seriously as a suitable framework for discussing short term macroeconomic fluctuations.

Although in macroeconomics the assumption of a representative consumer is arguably rather damaging, in microeconomics, welfare economics, and public finance it is devastating. For then it is usually also presumed that the welfare of the representative consumer indeed represents the welfare of the whole society. Also, when there is only one representative consumer in an economic model, nothing whatsoever can be said about issues relating to the distribution of income in the economy, including the way that this distribution interacts with other variables of interest. Obviously, too, the representative consumer models sweep under the carpet all the important issues connected with income distribution which I have been discussing in the last five sections. Specifically, welfare optimality and Pareto efficiency coincide, and so Pareto efficiency is clearly sufficient for ethical acceptability – at least

if one grants consumer sovereignty. Wealth is automatically optimally distributed. Either the single representative consumer can survive on his (her?) own or else nothing can be done. And the incentive incompatibility of lump-sum redistribution does not matter when there is no other person to redistribute to or from. It is true that the errors of neglecting income effects and measuring welfare using consumer surplus are just as possible and just as stupid in a one consumer economy, but this is not worth discussing any further.

There are two ways left to attempt to rescue the representative consumer. The first way harks back to the question of measuring national income and constructing social indifference curves, as in Samuelson (1950, 1956). Samuelson, however, postulated the unrealistic optimal lump-sum transfers which I discussed in Sections 7 and 10 above. Thereafter, Mirrlees (1969) considered the same issue in an economy where the assumption of optimal lump-sum transfers was replaced by an assumption of Diamond and Mirrlees (1971) optimal commodity taxes. Having progressed this far, it is not too difficult to take the next step and construct social indifference curves in the space of aggregate commodity vectors to represent an 'indirect' Bergson social welfare function, which measures social welfare on the presumption that the government uses whatever fiscal instruments it can to optimize the distribution of the aggregate commodity vector between all the individuals in the society. This was done in Hammond (1980) and some similar results have recently appeared in Varian (1984). However, this representative consumer is likely to be quite different from all the actual consumers in the economy. For example, even though all consumers may have strictly convex preference orderings, this artificial representative may well have preferences which are not even convex.

A second way of rescuing the representative consumer is suggested by Sen's (1976, 1979) approach to the problem of measuring national income. This treats each individual's consumption of a particular good as a 'social' commodity which is separate from the consumption of any other individual of the same good. In other words, different individuals' consumptions of the same physical good are treated as different social commodities. Moreover, in a perfectly competitive market economy in Walrasian equilibrium, there is a 'social price' of each such social commodity which is given by the product of the market price with the welfare weight of the relevant individual. This welfare weight represents the marginal value to society of allocating a marginal dollar (or other *numéraire*) to purchasing goods optimally for the individual in question – i.e. the social marginal utility of income. The society is then represented by one 'representative consumer' who buys all the social commodities at appropriate social prices, with tastes represented by a Bergson social welfare function. Inequality between different individuals' social marginal utilities of income is possible, reflecting the impossibility of arranging optimal lump-sum transfers. Like the first artificially constructed

'representative consumer' considered in the previous paragraph, this second one also may be quite unlike any of the actual flesh and blood consumers we are used to thinking about. In particular, the 'social prices' which he faces reflect social marginal utilities of income which may change in complicated ways in response to other changes in the economy. After all, these social prices are not just the usual kind of market clearing prices.

Both these artificial representative consumers are useful constructs in thinking about issues in theoretical welfare economics. They are far removed, however, from the usual kind of representative consumer, whose whole *raison d'être* seems to be the desire to avoid the distributional questions that are carefully taken into account in the two constructions I have just been discussing.

12 DISTORTIONARY TAXES CREATE DEADWEIGHT LOSSES

> Ideally it would be best to assess each enterprise with an annual lump-sum tax, reflecting its special advantages, so that it is equally hard to earn a profit everywhere, and profit reflects only the efficiency of the enterprise. But in practice this assessment would involve precisely the kind of friction which it is the aim of the self-regulating price system to avoid, and a profits tax, leaving the enterprise with whatever share is considered an adequate incentive to efficiency, is probably to be preferred. (Robinson, 1960, p.44)

Once one recognizes the incentive incompatibility of lump-sum redistribution, and starts to consider second best allocations which respect the incentive constraints due to private information, much of standard public finance theory is inapplicable. In particular, it is no longer necessarily true that 'distortionary' taxes are inefficient, or that they create deadweight losses. To show that there are such deadweight losses, standard theory considers replacing any distortionary tax – such as an income or commodity tax, or an import tariff – by an alternative system of lump-sum taxation which raises the same revenue. Usually, the analysis is conducted under the representative consumer assumption of the previous section. Then it is not difficult to show that the single consumer is better off paying over a given sum as a lump-sum rather than having his demand and supply decisions distorted through a system of commodity and/or income taxes which raise the same revenue. The consumer's willingness to pay to have the distortionary taxes replaced by a lump-sum tax is then a measure of the deadweight loss created by the distortions (see Pazner and Sadka (1980), Zabalza (1982) and King (1983) for recent discussions of some pitfalls in measuring deadweight loss for a single consumer).

The problem with measuring deadweight loss come once one gets beyond the unrealistic case of the representative consumer. Then one has to argue

that distortionary taxes can be replaced by alternative lump-sum taxes on all consumers (except some of the poorest who may receive lump-sum subsidies) so that all consumers are better off. If this were true, measuring the total over all consumers of the willingness to pay for having distortionary taxes replaced by lump-sum taxes is indeed a measure of the welfare loss occasioned by the distortionary taxes. Even if not all consumers are made better off, but the distortionary taxes are replaced by an optimal system of lump-sum taxes, so that a first best welfare optimum is achieved, one can still measure deadweight loss by the willingness of the society to pay to do away with distortionary taxes.

Once the argument is laid bare in this way, so are its inadequacies. For in Section 10 it was shown that lump-sum redistribution is generally infeasible because it violates incentive constraints. In particular, it is simply not possible in general to replace distortionary taxes by Pareto or welfare superior lump-sum taxes. Individuals will usually understate their true ability to pay the lump-sum taxes which are intended to replace the distortionary taxes. This involves a new kind of welfare loss which standard theory overlooks.

Indeed, the basic point can be made very simply. With incentive constraints, the kind of taxes which usual theory regards as 'distortionary' will feature in almost any second best Pareto efficient allocation. The 'optimal taxes' of Diamond and Mirrlees (1971) are not misleadingly described; they really are optimal when lump-sum taxes are incentive incompatible and when in addition non-linear pricing is impossible because consumers facing different marginal prices can do a deal on the side (Hammond, 1987). Even to call such taxes 'distortionary' is unfortunate, because they do not necessarily distort the economic allocation away from what is entirely desirable, provided that the taxes are set very carefully. The 'deadweight losses', of course, are then entirely illusory.

13 DOMESTIC PUBLIC EXPENDITURE PROGRAMS ARE WASTEFUL

> When there is unemployment and low profits the government must spend on something or other – it does not matter what. As we know, for twenty-five years serious recessions were avoided by following this policy. The most convenient thing for a government to spend on is armaments. The military-industrial complex took charge. I do not think it plausible to suppose that the cold war and several hot wars were invented just to solve the unemployment problem. But certainly they have had that effect ... It was the so-called Keynesians who persuaded successive presidents that there is no harm in a budget deficit and left the military–industrial complex

> to take advantage of it. So it has come about that Keynes's pleasant daydream was turned into a nightmare of terror . . .
>
> Hitler had already found how to cure unemployment before Keynes had finished explaining why it occurred. (Robinson, 1972, pp.6–7 and p.8)

> building weapons that become obsolete faster than they can be constructed has turned out far better than pyramids ever did to keep up profit without adding to wealth. (Robinson, 1962, p.92)

Another part of *laissez faire* economics is the hypothesis that public expenditure is usually wasteful. For some reason which no doubt has much to do with the persuasive power of what President Eisenhower, as he was retiring from office, called the 'military–industrial complex', that part of public expenditure which is allocated to what is usually euphemistically called 'defense' is exempted from this claim. But the purpose of this essay is to moralize about the state of neoclassical economic theology rather than about the arms race. So I shall concentrate upon non-military public expenditure and the claim that this is wasteful.

Of course, there is no doubt that as much, if not more, waste is created by public bureaucracies as by those in private corporations and institutions. What must be strongly contested, however, is the apparently common view that the 40 per cent or so of total national product that is spent by various public agencies is a wasteful drag upon the rest of the economy. For one thing, some of that 40 per cent represents transfer programs to the poor and elderly, which have a great deal of ethical justification, and only reduce the national product to the extent that they are financed by distortionary taxes, as will be argued in Section 14 below. Here, I want to discuss public provision of certain goods and services, from crime prevention to libraries, cultural events, publicly funded research, etc.

Extreme *laissez faire* economists argue that all such public expenditure is wasted. There seem to be two reasons for this claim, so far as I can understand them. The first reason goes so far back as to suggest that even the benefits of public goods may be misleading. The second simply focuses on the costliness of public goods, without denying that there may be benefits.

A deep objection to public expenditure may be the idea that all its benefits are illusory. It is hard for me to say, since it is not an argument that I readily understand, I must admit. What seems to be claimed is that publicly provided goods and services serve only to undermine the 'moral fibre' of the community or the nation. They devalue self-reliance. Private charity is to be preferred to public support. Such claims may be a disguised form of libertarianism, in which case they might deserve our respect in a world where institutions were indeed always set up when it was advantageous to do so. This reverts to Assumption 5, unbounded cooperation, and the 'efficiency

tautology'. Alternatively, such claims may simply reflect the ideological belief that *laissez faire* is inherently the ideal economic system, in which case further discussion of the kind I have been providing throughout this paper is clearly of no interest.

It may be rare even for politicians to claim that only military public expenditure is beneficial. But a related claim which has often been heard recently in the UK is that only jobs which are created within or by the private sector have any permanent value. Of course, given the way public expenditure gets treated these days, many public sector jobs have become much less secure than they used to be. But the pretence that, for instance, workers for British Telecom were socially unproductive until they started to carry out essentially identical jobs for the privatized near-monopoly they now work for, is clearly absurd. Yet that is what passes for logic in some political speeches these days.

Let me return to the cost issue, where there is at least a coherent argument which I can discuss. It focuses on the need to finance public goods with distortionary taxes, actually recognizing for once that the old theoretical ideal of lump-sum taxes is unattainable. Nor are the Lindahl taxes for public goods which modern first best theory also prescribes. Indeed, once the level of public good provision is fixed, personalized Lindahl tax payments become equivalent to lump-sum redistribution of income, based, however, on willingness to pay for public goods at the margin. Anyway, such tax schemes typically violate incentive constraints. A uniform lump-sum or poll tax would be incentive compatible, but if it were set high enough to cover the expenses of the public goods like good education which the wealthy appear to desire, and rightly so, there is no way that the poor could afford to pay for it. So there is no truly feasible way of financing public expenditure in general without some distortionary taxes. The standard theory of public finance would then ascribe the deadweight loss from these distortionary taxes as being an additional cost of public expenditure. But, where lump-sum taxes are incentive incompatible, it was shown in Section 11 that a measure of deadweight loss has no practical significance. Just as optimal commodity taxes really are optimal in the presence of incentive constraints, etc., so having public expenditure financed by 'distortionary taxes' may well be part of a second best welfare optimum.

So far I have said little about 'privatization' in Britain or 'deregulation' in the US. These are important matters, but they have far less to do with the desirability of public expenditure on public goods than with the question of the organization of industry and the desirability of public as against private ownership and control. These are subtle questions, without simple answers. There is some evidence that private ownership and control work better on incentive grounds, and some theoretical reasons for believing that price controls may be the best way of dealing with the problems that arise with natural monopolies, but like all interesting policy questions in economics,

there is no simple answer one can be dogmatic about. I shall have a little more to say about industrial organization in connection with Assumption 21.

14 TRANSFER PROGRAMS CONFER NO BENEFITS

> In its general influence on educated public opinion, orthodox teaching has been not merely feeble and confused but positively pernicious. It gives support to the view that expenditure by a government that is beneficial to the inhabitants of its territory is 'socialism' and must be prevented at all costs. This reconciles an otherwise more or less sane and benevolent public opinion to the arms race which seems to be dragging us all to destruction. But that is another story. (Robinson, 1985, p.160)

Here I want to consider the argument that transfer programs should be abolished. There are two aspects to this argument. One says that the benefits of transfer programs are illusory, because they remove people's incentives to provide for themselves. The second says that, even though it may be conceded that transfer programs do convey some benefits to their recipients, they only do so at an unacceptably large cost.

The first argument brings in incentive constraints with a vengeance, and says that they are so strong that redistributive policy is powerless because all it achieves is to replace private insurance and saving arrangements, and does so inefficiently and wastefully as a rule. This might be an argument with some validity in a world of perfect capital and insurance markets. But we do not see such perfect markets outside economics articles and textbooks, for reasons which I have already alluded to in Section 4 and will allude to again in Section 15 below. To give one very concrete example, it is only state pension schemes in both the UK and the US, and no doubt in many other countries too, which are indexed to the cost of living and so provide some reasonably safe guarantee against the adverse effects of inflation. Even with complete markets, however, some coordinated action is still needed to remedy past inequalities and injustices. The poor will always be with us and some of them will always be genuinely needy, even if some are not and choose to exploit whatever system of poverty relief is instituted. This exploitation by those who are not genuinely needy seems to be an inescapable feature of any transfer program, and one should certainly bear it in mind when designing the system. But it is no reason to abandon the truly needy.

The cost argument is also much exaggerated. To take an extreme case, if transfer payments were financed entirely by 'non-distortionary' lump-sum taxes, that part of 'public expenditure' would not really be additional expenditure at all – it is like having part of a family's income being spent by the children instead of by the parents. In fact, of course, transfer payments, like any other form of public expenditure, have to be financed by 'distortion-

ary' income or commodity taxes. Even so, just as with the need to finance public expenditure, which was considered in Section 13, much of the 'cost' of such 'distortionary' taxes in the form of 'deadweight loss' is entirely illusory, for reasons that were explained in Section 11. Indeed, transfer payments, together with the taxes used to finance them, should really be seen as parts of an overall scheme to replace incentive-incompatible lump-sum redistribution by an incentive-compatible public finance mechanism. Distortions and even abuses are inevitable in a world of limited information, but they are no reason to abandon the idea of redistribution completely. Far better to try to avoid such abuses by measures such as replacing 'welfare' by 'workfare' in the state of California.

Libertarians may object that if the redistribution that is brought about by transfer payments is something that the society truly desires, then it would be better to leave such transfers to voluntary charitable contributions. This, however, ignores the public good aspect of charitable contributions, and the temptation for different donors to 'free-ride'. It is true that Sugden (1982, 1983) has shown pretty convincingly that charity is not just motivated by the benefits conferred upon the recipients, so that the public good argument loses some of its force. Individuals who choose to give to charity for the very sake of giving are not so likely to be free riders. It may even be true, as some have claimed, that the growth of welfare state transfer programs has promoted the decline of private charity, because it fosters the belief that all the truly needy are receiving adequate support. Nevertheless, private charity has always been a somewhat ramshackle approach to providing relief for the needy. In addition, it often turns out to be a form of exploitation of those with exceptionally strong charitable feelings, who wind up much worse off than those who remain entirely selfish. Finally, given the kind of economic theology that many people have been taught in the past, in my view it would be highly unwise, if not downright unethical, to base transfer programs exclusively upon what individuals are willing to give voluntarily to poorer fellow human beings, at least until there has been time for influential people first to learn and then to teach some better economics.

15 CAPITAL MARKETS ARE PERFECT

> Among the disadvantages of various kinds of assets compared to money we may distinguish ... [l]ender's risk; that is, the fear of partial or total failure of the borrower. (Robinson, 1951b, p.94, and 1960, p.248)

> I was unemployed with debts of £400,000. I know what unemployment is like – and a lot of it is getting off your backside and finding yourself a job. (Jeffrey Archer, vice-chairman of the UK Conservative Party, in a speech on the eve of the annual party conference, as reported in the *Manchester Guardian Weekly* 13 October 1985)

> Gad, Jeffrey Archer is right! If only these layabouts would all go and get themselves into debt for a few hundred thousands, the unemployment problem would be solved. (Basil Mager, letter published in the *Manchester Guardian*, 20 October 1985)

So far, no mention has been made of imperfections in capital markets, particularly for financial assets. Much of neoclassical theory ignores such imperfections, with the result that the microeconomics of money has remained in an extremely unsatisfactory state, despite the recent work of Gale (1982, 1983). We know that credit rationing and bankruptcy or default are endemic features of virtually all economic systems, be they past, present, or in the conceivable future. Yet Stigler's (1967) plea for an exploration of what really underlies 'imperfections in the capital market' still goes largely unanswered, despite much recent work by Stiglitz and Weiss (1981, 1983, 1985) amongst others.

The existing literature on credit rationing has tried to integrate bankruptcy and credit rationing within a model of market equilibrium. Yet this is probably premature, since an important prior problem is to characterize what allocations of credit are truly feasible in a sequence economy. After all, in a static exchange economy, a Walrasian equilibrium allocation happens to be a particular kind of feasible allocation in which all agents are maximizing their preference subject to budget contraints, determined by their endowments and by the market-clearing price vector. In a static economy of pure exchange it is trivial to characterize the set of feasible allocations – at least in the case when all information is common. Sequence economies present new difficulties in enforcing debt repayment, however. And the only allocations that are truly feasible in a sequence economy are those in which, if a loan is ever to be repaid, there must be some mechanism for enforcing its repayment and preventing the borrower from escaping scot-free from his obligations. Indeed, as Townsend (1979) pointed out in connection with contingent contracts, the eventual outcome of an unenforceable contract is identical to the outcome of an equivalent contract which respects the constraints that arise because only enforceable repayments ever get collected.

Virtually all the theoretical work to date ignores this important issue of enforcement by assuming that a borrower will always choose to repay whenever he can afford to. Default only occurs when something unforeseen happens, and so never in a world of unbounded forethought. Yet in reality far from all borrowers are this honorable. If unlimited, unsecured loans were truly available, one would hear of far more people borrowing far more than they could ever afford to repay, and then running off to some remote desert island for a life of sun-drenched luxury. Of course, this is a form of fraud that can be punished under the criminal law, but not if the desert island in which they seek refuge makes a point of harboring immigrants of dubious reputation provided that they bring with them plenty of cash. Bank robberies would cease, since would-be robbers could simply take out loans which they

have no intention of ever repaying, thus robbing the banks with the consent of the bankers.

If banks and individual savers are not both to be stripped of all their assets, credit rationing becomes unavoidable. There is simply no way to decentralize enforceable credit allocations through ordinary competitive markets as one can decentralize incentive compatible allocations in static economies (Hammond, 1979, 1985, and Section 10 above). A form of fiat money can be used to enforce credit rationing, but only provided that the amount which is issued to any one agent is itself subject to a form of non-price rationing. Agents who secure their borrowings by pledging tangible assets as collateral may be able to increase the credit they are allowed, but they will still face a credit ceiling which depends on the value of the collateral. Decentralization is lost because some central agency is required to monitor each agent's total borrowings and pledges of collateral in order to ensure that the credit ceiling is never exceeded. Otherwise, an agent may find it worthwhile to borrow a small amount from a large number of lenders before absconding to his desert island. In the event that a borrower does default, the distribution of his assets between different creditors also requires some form of central coordination, such as bankruptcy courts try to provide.

The inevitability of credit rationing in any sequence economy promises to have profound implications which are only just beginning to be explored. For a start, the 'Clower' or 'cash in advance' constraint (see Clower, 1963a, b; and Lloyd, 1964, 1968), which has been so prevalent in recent literature on the microeconomic foundations of monetary economics, may now receive a much more satisfactory theoretical foundation. At last economic theory is moving a little closer to common sense.

Much recent work in game theory has grown out of Selten's (1965, 1973) concept of perfection for extensive form games. This has forced economists to think about what happens off an equilibrium path in an extensive form game, and how that influences the appropriate kind of Nash equilibrium when players foresee that some equilibrium strategies require entirely unreasonable behavior when a player finds himself off the presumed equilibrium path. As Joan Robinson herself put it on p.25 of *Essays in the Theory of Economic Growth*, 'A world in which expectations are liable to be falsified cannot be described by the simple equations of the equilibrium path.' More recently, Kreps and Wilson (1982) have extended Selten's notion of perfection and introduced the term 'sequential equilibrium'. An implication of the work reported in this section is the amusing paradox that, in a sequence economy with financial markets, a Walrasian equilibrium is not a sequential equilibrium once one considers what is to be done to borrowers who deliberately avoid repayment. The result will come as no surprise to Shubik (1973, 1974), though the simplicity of the argument might.

16 ANTICIPATED MONETARY AND FISCAL POLICIES ARE INEFFECTIVE

> There is in some quarters a great affection for credit policy because it seems the least selective and somehow lives up to the ideal of a single overall neutral regulation of the economy. The enormous ideological attraction of the Quantity Theory of Money, that kept it going for nearly forty years after its logical content was exploded (in Keynes's *Tract on Monetary Reform*), is due to the fact that it conceals the problem of political choice under an apparently impersonal mechanism.
>
> Recent experiments have shown, however, that there is no such thing as a purely quantitative, overall financial policy . . . There is no simple right policy. (Robinson, 1962, p.93)

A great deal of recent work in macroeconomics has been misdirected toward such fruitless questions as whether money is neutral (or even 'superneutral') in the sense that anticipated monetary policy affects only the value of some suitably perfect price index which is called 'the price level'. A more subtle and interesting contention is that if monetary or fiscal policies do have any real effects, they do so only by bringing about deleterious changes, or, at best, by moving the economy around the Pareto frontier. It is asserted that such policy can never generate a Pareto improvement, and so is never essential for Pareto efficiency. It has also been claimed that the national debt has no effect on the real economy, because agents foresee that they or their descendants will have to pay extra taxes in the future in order to service and eventually repay the debt. Some of the relevant writings are by Barro (1974, 1976), Sargent (1973), and Sargent and Wallace (1975). Of course, it is probably only a minority of macroeconomists who have taken such arguments at all seriously. Nevertheless, as with most of the dubious assertions which I have been discussing, it seems that those who propound them may be having undue influence. One fears this may be because they provide the message which some politically powerful proponents of *laissez faire* wish to hear.

If Robinson Crusoe is one lone consumer, transacting with nobody else at all on his desert island, then his demand prices for each good, measured in terms of money, are indeed likely to be proportional to the number of monetary units over which he has command. If we face him with not only a Walrasian budget constraint, but also with a liquidity constraint to prevent him from borrowing excessively intending never to repay (as we must in a sequential environment for reasons which I discussed in the previous section), then again demand prices will be proportional to the number of units of liquidity to which Robinson Crusoe has access. In such an economy, then, money really is neutral, and monetary policy affects only nominal prices; it cannot get in the way of Robinson Crusoe choosing an optimal plan for producing, collecting, and consuming his coconuts or whatever else is

available to him upon his island. Policy is and should be completely ineffective, unless it induces Crusoe to depart from his optimum somehow.

The Robinson Crusoe example may seem rather far-fetched, yet much of contemporary macroeconomic analysis is conducted using such a model. A little more sophisticated are those models with a continuum of identical individuals, some of which I mentioned in Section 4. They allow both trade and borrowing and lending between different individuals, at least in principle, even if in equilibrium no such trade or borrowing and lending actually takes place. They also provide some scope for introducing jointly owned firms with limited liability. As soon as such firms are introduced, however, there is scope for monetary or fiscal policy. For, when firms' liability is limited, the credit limits faced by those firms matter, as well as those faced by all the identical individual consumers. Notice that *both* consumers and firms do need to be constrained in their borrowing, in general, otherwise some joint owners of firms are likely to use the unconstrained borrowing facilities of their firms in order to escape from the restrictions on their personal borrowing, which are needed to ensure existence of equilibrium. When consumers are identical and have convex preferences and when the technology is also convex, there is a symmetric Pareto-efficient allocation in the economy which one may call 'optimal' with some justice. Unless the ratio of the credit limit of each consumer to that of each firm is suitable, however, this optimum may be unattainable in any competitive equilibrium of the economy, because either all the identical individuals or at least one of the firms may find themselves prevented by liquidity constraints from choosing an optimal borrowing plan. Mind you, in this case of identical consumers, ensuring that such liquidity constraints never bind might seem rather easy. Nevertheless, the point is made that money may not always be neutral, and that monetary policy may well have real effects unless that policy takes a very special form which preserves the proportions of the total money stock held by each agent in the economy.

This conclusion is not seriously affected, moreover, by the 'classical invariance principle' discussed by Patinkin (1965), Archibald and Lipsey (1958), Clower and Burstein (1960) and Samuelson (1968) (all collected in Clower, 1969), according to which long-run equilibrium is invariant to whose liquidity constraints are alleviated; all that matters is the total nominal amount of credit. The point this analysis overlooks is the possibility of permanent harm being done by the short-run effects of credit constraints, upon the investment of business firms, or the 'human capital' of individuals, possibly including their state of health or even their very survival.

The other possibility that arises in moving from Robinson Crusoe to an economy of many identical individuals is that there are externalities and public goods. It is surely significant that much of recent macroeconomics considers models of the economy in which, if tax revenue is raised, it is spent – or rather it is dissipated – in ways that have no effect on the

representative consumer's utility. Not surprisingly, then, in these models the optimal fiscal policy is to have no public expenditure and no taxes at all. Perhaps the macroeconomists were trying to take too seriously Keynes's suggestion that useful public works might include digging holes in the ground only to refill them again immediately. Or else implicitly admitting that much of the share of public expenditure devoted to armaments really does do nobody any good. However that may be, they should at least consider the possible direct benefits of public expenditure, even if many of them seem predisposed to think that those benefits are likely to be zero. A better case for neglecting public goods in macroeconomics is the assumption that preferences for private goods are independent of public goods. With such separable preferences, one can legitimately neglect the influence of public goods on the private economy, once one has reckoned with the need to finance the public goods. Once the size of the public budget is fixed, there may be neutrality in this separable case. But such separability is not very plausible, because much public expenditure is on services like education and health which clearly affect the demand for privately provided alternatives, if nothing else.

So far, I have remained within the representative consumer framework, stultifying though this is. Outside it, there is much more scope for both monetary and fiscal policy, affecting the distribution of wealth and of credit constraints within the population. Although if there is sufficient altruism between different consumers in the economy, it turns out that almost every economic policy which does not affect production directly is completely ineffective, because its direct effects would be completely offset by the transfer policies undertaken by individual altruists. These conclusions of Bernheim and Bagwell (1988) could be dismissed as laughable if it were not for the fact that they simply extend the application of those arguments used by Barro (1974) to prove his 'Ricardian equivalence theorem'.

A more interesting question is whether fiscal and monetary policy can generate Pareto improvements in the economy, so that they are likely to be required in order to achieve any Pareto-efficient allocation. In the first place, it should be pointed out yet again that, because Pareto efficiency is insufficient for ethical acceptability, this question is somewhat beside the point; if fiscal and monetary policies are suitable means for redistributing wealth, then an optimal allocation may well rely on such policies. A more appropriate but entirely artificial test, therefore, is to assume that optimal lump-sum redistribution has already occurred, and then ask whether there is any scope for such policy. In a first best world of full information, the answer is that fiscal policy may still be required in the sense that certain public goods have to be financed, and that monetary or credit policy must ensure that each agent in the economy is not prevented by liquidity constraints from achieving his part of an optimal allocation. Once we move on further, however, into an economy with private information in which the truly feasible allocations must satisfy incentive constraints, then there is even more scope for both

kinds of policy, and some forms of monetary and fiscal policy will indeed be Pareto superior to others, in general. Indeed, remember that even 'distortionary' taxes may now be Pareto efficient, and some distortionary tax schemes Pareto superior to others. Moreover, the analysis of Guesnerie and Roberts (1984) shows that some quantity rationing may be preferable to having only commodity taxation even in a static economy; so, *a fortiori*, it seems very likely that appropriate forms of credit rationing will be Pareto superior to other forms once one enters a sequence economy.

17 INFLATION IS CAUSED BY AN EXPANDING MONEY SUPPLY

> Inflation is always and everywhere a monetary phenomenon in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output. (Friedman, 1970, p.24)

Thus does Friedman deny that inflation can ever be due to an increase in the velocity of circulation of money, or caused by non-monetary phenomena such as an oil price shock which, while having nothing to do with the supply of money function, happen coincidentally to increase either the velocity of circulation or even the measured quantity of money. It is the old quantity theory, in its strictest form, whose inadequacies were pointed out by, among others, Joan Robinson. The *Review of Economic Studies* is a journal (published by a group of young economists) which she helped to found – see Robinson (1979b, p.xv) for her very brief account of some of the relevant history. In its very first issue, following a translation by another founder, Ursula Webb (later Hicks), of Umberto Ricci's tribute to Pareto, the second article was by Joan Robinson and related to Keynes's recently published *Treatise of Money*. Included in it we find the following piece of satire:

> It was in protest against this naive view of the theory of money that Mr Kahn set out the Quantity Equation for hairpins. Let P be the proportion of women with long hair, and T the total number of women. Let $1/V$ be the daily loss of hairpins by each woman with long hair, and M the daily output of hairpins. Then $M = PT/V$, and $MV = PT$. Now suppose that the Pope, regarding bobbed hair as contrary to good morals, wishes to increase the proportion of long-haired women in the population, and asks a student of economics what he had best do. The student sets out Mr Kahn's equation, and explains it to the Pope. 'All you need to do', he says, 'is to increase M, the daily output of hairpins . . . and the number of long-haired women is bound to increase.' The Pope is not quite convinced. 'Or, of course', the student adds, 'if you could persuade the long-haired women to be less careless, V would increase, and the effect would be the same as though the ouput of hairpins had increased.'

> Now the experts in the Theory of Money avoided these crude errors, but when they recognized that their equations were tautologies without causal significance they were beset by an uneasy feeling that their theory only provided them with wisdom after the event. Anything that had happened could always be explained in terms of their truisms, but they were never very confident in predicting what would happen next. (Robinson, 1933, pp.22–6; and 1951a, pp.54–5)

Later, after Friedman had made his impact upon the economics profession, she was hardly less forthright:

> A great part of [the] work [of the modern Chicagoans, led by Milton Friedman] consists in historical investigations of the relationship between changes in the supply of money and national income in the United States. The correlations to be explained could be set out in quantity theory terms if the equation [$MV = PT$] were read right handed. Thus we might suggest that a marked rise in the level of activity is likely to be preceded by an increase in the supply of money (if M is widely defined) or in the velocity of circulation (if M is narrowly defined) because a rise in the wage bill and in borrowing for working capital is likely to precede an increase in the value of output appearing in the statistics. Or that a fall in activity sharp enough to cause losses deprives the banks of credit-worthy borrowers and brings a contraction in their position. But the tradition of Chicago consists in reading the equation from left to right. Then the observed relations are interpreted without any hypothesis at all except *post hoc ergo propter hoc.*
>
> There is an unearthly, mystical element in Friedman's thought. The mere existence of a stock of money somehow promotes expenditure. But insofar as he offers an intelligible theory, it is made up of elements borrowed from Keynes. An increase in the basis of credit, say by open-market operations, permits the banks to satisfy part of the 'fringe of unsatisfied borrowers' or to offer loans on easier terms; part of additional bank lending goes to various financial intermediaries and part goes into the market for bonds. A general easing of interest rates puts up the Stock Exchange. In various ways this permits investment plans to be carried out that otherwise would have been frustrated for lack of finance, as well as encouraging purchases, especially of consumer durables, both because loans are easier to get and because, with a rise in the capital value of placements, rentiers reduce their rate of saving. Thus, *other things equal*, an increase in the quantity of money promotes an increase in activity. (Robinson, 1971, pp.86–87)

These rather obvious considerations, not to mention those concerning the effects of credit policy in Section 16, imply that the 'quantity theory' of money is an excellent example of Friedman's contention that a theory is all the better if its assumptions appear unrealistic to start with. Indeed, it is

especially illuminating to keep the quantity 'theory' in mind when reading 'The Methodology of Positive Economics', particularly passages like the following:

> The difficulty in the social sciences of getting new evidence for ['the class of phenomena the hypothesis is designed to explain'] and of judging its conformity with the implications of the hypothesis makes it tempting to suppose that other, more readily available, evidence is equally relevant to the validity of the hypothesis – to suppose that hypotheses have not only 'implications' but also 'assumptions' and that the conformity of these 'assumptions' to 'reality' is a test of the validity of the hypothesis *different from* or *additional to* the test by implications. This widely held view is fundamentally wrong and productive of much mischief. Far from providing an easier means for sifting valid from invalid hypotheses, it only confuses the issue, promotes misunderstanding about the significance of empirical evidence for economic theory, produces a misdirection of much intellectual effort devoted to the development of positive economics, and impedes the attainment of consensus on tentative hypotheses in positive economics.
>
> In so far as a theory can be said to have 'assumptions' at all, and in so far as their 'realism' can be judged independently of the validity of predictions, the relation between the significance of a theory and the 'realism' of its 'assumptions' is almost the opposite of that suggested by the view under criticism. Truly important and significant hypotheses will be found to have 'assumptions' that are wildly inaccurate descriptive representations of reality, and, in general, the more significant the theory, the more unrealistic the assumptions (in this sense). The reason is simple. A hypothesis is important if it 'explains' much by little, that is, if it abstracts the common and crucial elements from the mass of complex and detailed circumstances surrounding the phenomena to be explained and permits valid predictions on the basis of them alone. To be important, therefore, a hypothesis must be descriptively false in its assumptions; it takes account of, and accounts for, none of the many other attendant circumstances, since its very success shows them to be irrelevant for the phenomena to be explained.
>
> To put this point less paradoxically, the relevant question to ask about the 'assumptions' of a theory is not whether they are descriptively 'realistic', for they never are, but whether they are sufficiently good approximations for the purpose in hand. And this question can be answered only by seeing whether the theory works, which means whether it yields sufficiently accurate predictions. (Friedman, 1953, pp. 14–15)

These views on methodology represent what Samuelson (1963) called the 'F-twist' (see also Wong, 1973). So extreme are they that not even all

monetarists seem to have been in agreement with them. Yet Johnson (1971) was definitely of the opinion that Friedman's methodology is crucial for the rise of the new monetarism; as he writes of the monetarist counter-revolution:

> The demand for clarification of the mechanism by which results can be explained is contrary to the methodology of positive economics, with its reliance on the 'as if' approach. But it will have to be answered satisfactorily if the monetarist counter-revolution is to win general acceptance among the profession; and the attempt to answer it will necessarily involve the counter-revolutionaries in the opposing methodology of general-equilibrium systems and multi-equation econometric models. (Johnson, 1971, p.13)

On Friedman's terms, therefore, the quantity 'theory' is no more than a hypothesis which stands or falls according to how consistent it is with just aggregate data. When one looks for a theory in the usual sense of the word, all that one finds is that the effect of an expanded money supply cannot be predicted in general without knowing much more about whose access to credit was eased, and what distributional effects ensue. The quantity 'theory' is therefore no more than the empirical hypothesis that, in predicting the rate of inflation of price indices measured by various government statisticians, all the distributional effects of any worthwhile theory get swamped by the effects of the money stock itself, as measured by a different set of statisticians. This may have been right for a relatively closed economy like the US used to be for much of the period which Friedman and Schwartz (1963) had originally studied, despite the problems with their statistical tests pointed out by Hendry and Ericsson (1983) in connection with the later study of both the US and the UK (Friedman and Schwartz, 1982). But unless expectations are explicitly incorporated in the empirical study, there is no way of telling whether the quantity of money is to be blamed for inflation directly, or if the supply of money adjusts to the expected rate of inflation, as monetary authorities try to cap nominal interest rates through open market operations. Notice that if this were the case, increases in the money supply could well lead inflation, as the quantity theorists claim that they have, without actually being the cause of inflation.

This alternative explanation of any correlation between increases in the money supply and inflation may seem more plausible for the UK, in which for many years the Bank of England did indeed profess to follow a monetary policy of pegging simultaneously both the sterling/dollar exchange rate, and – with somewhat less success – nominal interest rates. But the UK was a much more open economy than the US, of course, even under exchange controls. So it may not be too surprising that the rate of inflation for the UK seems to be more influenced by the money supply of the US rather than that

of the UK, according to Cuddington (1981). Indeed, one of the reasons for the collapse of British manufacturing industry in 1980–2 may have been the inclusion in UK money supply statistics of various foreign holdings of sterling, at a time when foreign capitalists decided to hold far more sterling assets following the 1979 oil crisis, and also because of the high interest rates caused by the restrictive monetary policy itself. The effect was to make monetary policy based on money supply targets excessively restrictive when it was being used to try to eliminate the inflation which had largely been caused by higher fuel prices and a higher rate of value added tax. In such circumstances, basing policy on the quantity 'theory' is not only unscientific, but can also bring about a catastrophic 'Friedmanic' depression.

18 THERE IS A REPRESENTATIVE WORKER

> Full Employment is a Good Thing, and it is conceived to be attainable by wise policy. It is a blessed state, like equilibrium. We must be able to say what it is.
>
> Beveridge proposed the criterion of the relation between the number of unfilled vacancies and of registered unemployed. Both figures are obviously very rough indicators of what they are intended to indicate and, even if they were quite exact, an over-all equality between them would not represent a critical point in the relation of supply and demand for labour, since the very coincidence of unfilled vacancies and unemployed workers shows that they do not fit, either because they are geographically separated or because the vacancies are for particular types of work which the unemployed cannot offer. (Robinson, 1962, pp.86 and 88)

Another problem with theoretical macroeconomics is its tendency to discuss *the* labor market, as though there were not many markets for many different kinds of labor. Then it is usual to consider the aggregate demand and the aggregate supply of labor, and ascribe all of unemployment to the discrepancy between the two. Yet it is quite obvious that a strong demand for some types of labor often co-exists with a much weaker demand and indeed unemployment of many of the suppliers of other types of labor. Moreover, in most countries one finds significant regional variations in unemployment rates among similar types of workers.

These obvious empirical facts are hard to explain in any model of Walrasian equilibrium with only one aggregate labor market. And even if labor were properly differentiated according to type, it seems at first rather hard to account for the wide diversity of employment opportunities among people who are very similar in aptitude and background, though perhaps not in employment history. To account for this diversity, any Walrasian type of

model has to be greatly disaggregated. It also has to recognize the non-convexities in labor markets (Coles, 1986; and Funaki and Kaneko, 1986) which arise from the costs of travelling to and from work, the difficulties of organization, etc. Why else do people work at only one or two regular jobs at any one time, instead of spending a small fraction of their time on each of a large number of jobs?

Indeed, what most theories of labor markets neglect is the peculiar characteristics of many jobs, as discussed by Akerlof (1981), and the peculiar circumstances of each potential worker. Workers have to be matched with jobs, which leads to an assignment problem which is somewhat different from the kind of allocation problem usually considered in economics – see, for instance, Crawford and Knoer (1981), Roth (1982). This matching problem is greatly complicated by the difficulties both potential employers and employees have of discovering each other's true characteristics before agreeing, at least provisionally, to a match.

Another important feature of labor markets is the slowness of turnover (Hall, 1982). It appears that employees experience significant costs of relocation and adjustment to new jobs, while many employers find that a new employee takes a long time to train to perform a new job satisfactorily. Both sides gain from maintaining a long-term employment relationship. Firms featherbed workers during periods of low demand, and use expensive overtime rather than inexperienced new workers when demand is high. Workers who are made redundant suffer real hardship because it is difficult to find a new employer who values their work as much as their former employer did.

All of these features of realistic labor markets could be included in a Walrasian model in which the wage attached to each job and to each type of worker, with each different history of past employment, would clear all labor markets in the sense of matching mobile workers to vacant jobs at each moment of time. Such perfection in matching is unlikely to be achieved in practice, of course, but it is interesting to explore its theoretical implications. There are likely to be a lot of asymmetries, in the sense that identical workers receive very different kinds of jobs, because of the inherent non-convexities and the large costs of adjustment. Some who are particularly unfortunate may not receive any wage offer at all above subsistence, and so choose to rely on unemployment benefit, begging, or whatever other means of support they find available. While their unemployment is 'voluntary' in the sense they choose to be unemployed rather than to take up any of the extremely unattractive job offers they receive, their hardship certainty is not voluntary. Much fruitless debate might have been avoided had Keynes chosen to speak of 'involuntary hardship' rather than 'involuntary unemployment'.

It must be admitted that Walrasian models of labor markets with perfect and complete information, and unbounded rationality and forethought on the part of the workers, are unlikely to explain much of the hardship

currently being experienced by many of the unemployed. Once such imperfections are added, however, it seems likely that the very limited job opportunities faced by at least a majority of the unemployed will be laid bare. And that even those who face reasonable job opportunities, if they knew better how to go about finding them, may still wind up facing severe hardship. There may even be a possibility of involuntary unemployment if employers judge the quality of applicant workers by the wage at which they are willing to work. For it can happen that the expected contribution of a worker, conditional upon the wage he is willing to accept, is less than the wage, no matter how low that wage may be. This is the possibility underlying the efficiency wage model of unemployment due to Stiglitz (1974, 1976, 1984) (see also Weiss 1980, Malcomson 1981 and Yellen 1984). Indeed, with imperfect information, it may even be optimal to face some individuals with such poor job opportunities that they will not want to take them. That does not imply, however, that such individuals should be made to face undue hardship; rather, society should be willing to pay a price to support its least productive members, if it really is impossible or too costly to find suitable jobs for all.

Thus involuntary hardship together with unemployment is a real possibility once one admits the possibility of incomplete information. Recognizing the bounds on individuals' rationality and foresight merely strengthens the above explanation, and also explains why it is so hard for the afflicted to escape their plight. Whether employment is voluntary or involuntary is largely beside the point. What is crucial, however, is avoiding excessive aggregation and the concept of a representative worker to summarize all the different workers and different types of worker. Indeed, if such aggregation is insisted upon, a more accurate approximation to reality may involve two different kinds of worker – one employed at the representative wage, and a second without any job opportunities whatsoever – rather than the fiction that all workers can be employed at the representative wage. In the first approach, the second kind of worker is effectively involuntarily unemployed. Thus, although the concept of involuntary unemployment (as opposed to grossly unequal opportunities and the possibility of involuntary hardship) is hard to justify in any microeconomic model, it may provide a better approximation to reality in a macroeconomic model.

All the above was concerned with that part of unemployment that is measured and apparent to all. One must not overlook the additional 'disguised unemployment' whose very existence was apparently first pointed out by Joan Robinson in an article published in the same year as Keynes's *General Theory*. The concluding sentence gives a clear pointer to how much is lost by assuming a representative worker holding a representative job, with no possibility of misallocating labor between different labor markets: 'The analysis of disguised unemployment makes it clear that while everybody is *occupied* for twenty-four hours a day, so that the total amount of occupation

can never be increased, yet *employment* can be said to increase when part of a man's time is transferred from an occupation in which its productivity is lower to one where it is higher (Robinson, 1936, p.237).

19 THE CURRENT LEVEL OF UNEMPLOYMENT IS ETHICALLY ACCEPTABLE

> A new orthodoxy was soon established by a simple device. A substitute for Say's Law was provided by the assumption that a well-managed Keynesian policy keeps investment running at the level which absorbs the saving forthcoming at full employment. The rest of the doctrines of the neoclassics could then be revived. (Robinson, 1971, p.x)

So far I have avoided many of the issues with which Joan Robinson concerned herself repeatedly in her writings. In particular, I have not discussed Say's law and the meaningfulness of the closely associated Keynesian notion of involuntary unemployment. Nor have I mentioned capital theory or the economics of imperfect competition. All of these are undeniably important, but also unecessarily contentious; I have preferred to gnaw away at those fundamental assertions in economics which contemporary fashion finds less contentious. I shall do the same in connection with the 'neoclassical synthesis', which Joan Robinson associated with a relative of Keynesianism of dubious parentage.

The neoclassical synthesis she had in mind is usually ascribed to Samuelson (see Feiwel, 1982, 1985c), although actually it is inspired by Keynes's *General Theory* (1936, pp.378–9):

> I conceive, therefore, that a somewhat comprehensive socialisation of investment will prove the only means of securing an approximation to full employment . . . But beyond this no obvious case is made out for a system of State Socialism which would embrace most of the economic life of the community . . . If the State is able to demonstrate the aggregate amount of resources devoted to augmenting the instruments [of production] and the basic rate of reward to those who own them, it will have accomplished all that is necessary . . .
>
> Our criticism of the accepted classical theory of economics has consisted not so much in finding logical flaws in its analysis as in pointing out that its tacit assumptions are seldom or never satisfied, with the result that it cannot solve the economic problems of the actual world. But if our central controls succeed in establishing an aggregate volume of output corresponding to full employment as nearly as is practicable, the classical theory comes into its own again from this point onwards. If we suppose the volume of output to be given, *i.e.* to be determined by forces outside the

> classical scheme of thought, then there is no objection to be raised against the classical analysis of the manner in which private self-interest will determine what in particular is produced, in what proportions the factors of production will be combined to produce it, and how the value of the final product will be distributed between them ... Thus, apart from the necessity of central controls to bring about an adjustment between the propensity to consume and the inducement to invest, there is no more reason to socialise economic life than there was before.

This passage is very near the end of Keynes's *General Theory*, whereas the neoclassical synthesis *starts* with the presumption that macroeconomic policy somehow always ensures full employment – whatever that may mean – and then describes what should happen in the rest of the economy. With full employment assured by assumption, neoclassical economists could go back to their old pre-Keynesian models of Walrasian equilibrium. This assumption is therefore very like Assumption 7 above, that the government would always ensure an optimal, or at least an ethically acceptable, distribution of wealth. Yet little if any discussion is provided of the difficulties in achieving this elusive goal of full employment, just as orthodox first best welfare economics neglects the question of how to implement wealth redistribution.

I contested Assumption 10 with the observation that there is in fact no truly feasible mechanism for redistributing wealth that does not involve commodity taxes and other kinds of economic policy, which first best welfare theory regards as distortionary. Moreover, this realization comes from considering the problem of redistribution explicitly in an economy with private information. The neoclassical synthesis promises something similar. Once we understand much better what really are the causes of so much distressing unemployment, we are unlikely to feel able simply to assume unemployment away in all the rest of our economic analysis. Instead we may begin to realize how the unemployment problem interacts with many other aspects of the economy, including imperfect capital markets. The current situation seems to be that economists are in disarray over the causes of unemployment, leaving the field free for politicians to claim that nothing much should be done about it because the unemployed are too lazy to want a job, or because many of the unemployed are really participating in the underground economy while simultaneously claiming unemployment benefit, or because unions set wages and working conditions too high to allow firms to hire enough new workers to eliminate unemployment. Such claims are all the more dangerous for being at least half truths.

So, rather than pretend that unemployment is abnormal, or that there is some 'natural' rate of unemployment, it is time for economists to abandon some of the assumptions that make unemployment seem so abnormal. The sections above contain plenty of suggestions, including bounded rationality, and disaggregated labor markets which incorporate non-convexities. There is

the risk that making unemployment seem less abnormal may also make us too tolerant of the imperfections in labor markets of which it is the symptom. On the other hand, recognizing that even rather well-functioning labor markets may leave some unfortunate individuals facing real hardship may lead to more acceptance of the welfare programs that are set up to alleviate such hardship, even if they are expensive, rely on fairly heavy 'distortionary' taxes, and make more payments than would be ideal to those whose hardship is self-inflicted or else more apparent than real. As we read in Robinson (1936, p.228):

> The attitude of mind, prevalent even now in certain quarters, that unemployment is the result of a vicious idleness of disposition in the unemployed individuals, pandered to by the dole, is largely an anachronism which had some plausibility in an epoch when there was open access to the land, so that any active and laborious individual could make a livelihood, when he fell out of employment, not glaringly different from what he had obtained in his former trade.

20 THERE IS A REPRESENTATIVE CAPITAL GOOD

> The latter-day neoclassicals have made the basis of the old orthodoxy much clearer than it was at the time when Keynes was trying to diagnose it. In their models it is explicitly assumed that there is and has always been correct foresight, or else 'capital' is malleable so that the past can be undone (without cost) and brought into equilibrium with the future; in short, they abolish time. (Robinson, 1971, p.89)

> In Solow [(1956a) he] had three assumptions which allowed him to ignore expectations: (i) malleable capital, (ii) constant savings ratio, (iii) instantaneous adjustment of all markets. If any one of these three is dropped, the dynamic paths are drastically changed. (Stiglitz, in Mirrlees and Stern, 1973, p.163)

> It was fun to tease Samuelson, but this debate took attention away from the main issue. (Robinson, 1979b, p.xviii)

This is the third aggregation problem considered in this essay, following the problems of aggregating the consumption side of the economy into one representative consumer, and that of aggregating all labor markets and all workers into one representative worker. I have saved the capital aggregation problem until the last of the three because, at this stage of our knowledge of economics, it seems much less important than the other two. This probably just reflects the fact that we are still struggling with important aspects of

static and stationary economies; difficulties with capital aggregation will play a more prominent role in the future, I hope, when static and stationary economies become much more perfectly understood. Yet it is the capital aggregation problem that has had by far the most ink spilt over it. Just a small sample of relevant writings are: Robinson (1953, 1956); Champernowne (1953); Solow (1956a,b, 1963); Samuelson (1962); Bruno, Burmeister and Sheshinski (1966); Harcourt (1972); Stiglitz (1973); Bliss (1975); Patterson and Schott (1979); and Burmeister (1980).

The most revealing exposition of what the capital theory debate was all about may be in the pages of Mirrlees and Stern (1973) – especially in the discussions of the papers by Stiglitz and Hahn. Originally Joan Robinson (1953) had considered capital aggregation as a problem even before Solow's (1956a) fundamental paper on economic growth. Solow did away with the knife-edge instability problems of the older Harrod–Domar model by having a variable capital output ratio which could adjust in order to maintain full employment at all times. The 'warranted' rate of growth based on the demand side of the economy, including the demand for investment goods, could be brought into line with the 'natural' rate of growth based on the supply of labor, adjusted to accommodate labor-saving technical progress. The adjustment was achieved by varying both the real wage and the real rate of interest in order to clear the three markets for output, labor and capital simultaneously. The result was a stable economy tending toward a steady state, or at least toward a balanced growth path.

As was shown in particular by Hahn (1966, 1968), the achievement of long-run steady states or balanced growth becomes a great deal harder in the presence of many capital goods. Even with perfect foresight, once there is more than one capital good, a steady-state equilibrium typically becomes unstable; it will only be reached if the initial prices of the various capital goods are exactly right, reflecting precisely appropriate expectations about future prices of capital goods.

Mathematically, this reflects the stability properties of any dynamic system. In continuous time, if there is only one state variable, the asymptotic properties of solutions to a differential equation in that single state variable are relatively trivial. Either the solution converges to one of the (possibly many) stable stationary states of the system, or else it diverges off to infinity. In the Solow (1956a) growth model, the quantity of the single capital good is the one state variable of the system. The corresponding co-state variable is the price of capital or, if the price of output is normalized to one, a discounted average of future rates of return to capital. This too is stable. However, if time is discrete, or if there is more than one state variable in the system, no such simple asymptotic properties are possible. Even the asymptotic dynamics of the system may be chaotic – i.e. effectively indistinguishable from random – even though the system may be deterministic, like the

procedures used to calculate 'random' numbers within a computer (see Brock 1986).

Like so many of the other assumptions I have been considering, this one too hardly appears to be worth further discussion. Any realistic model of an economy is bound to have many state variables – e.g. one state variable to represent each individual's wealth, for a start. It is entirely appropriate that the capital theory debate should have been put away into some dusty corner because it has now become irrelevant; most economists simply do not use one capital good growth models any more, except for teaching purposes. Would that the same were true of the other assumptions considered in this essay.

21 PRODUCT MARKETS ARE PERFECTLY COMPETITIVE, OR AT LEAST CONTESTABLE

> The theory ... [of contestable markets] ... offers a standard for public policy that is far broader and more widely applicable than the traditional ideal of perfect competition. (Baumol, 1985, p.326)

> [T]he whole notion of normal profits is beset with difficulties. Mr Shove [(1933)] has pointed out that there is not one level of normal profits, but two. The level of profits which will attract new enterprise into an industry is usually higher than the level which is just sufficient to retain existing enterprise. Entry into a trade is likely to involve considerable expense, and often involves, as Marshall was fond of pointing out, a lean period of low profits before the name of the firm becomes known. (Robinson, 1934, and 1951a, p.23)

In the previous sections of this essay, I have hardly stepped outside the bounds of Walrasian equilibrium analysis, suitably modified in all sorts of ways such as recognizing bounds on individuals' rationality and forethought, and the desirability of introducing 'distortionary' taxes both in order to achieve desirable redistribution of real purchasing power, and also to finance the provision of public goods. The only major departure from modified Walrasian analysis was in Section 15, where we were forced to recognize the impossibility of having perfect Walrasian credit markets in anything like a recognizable form, because credit rationing is inevitable. Yet obviously it would be remiss of me not to discuss at all the theme of Joan Robinson's first major book, *The Economics of Imperfect Competition*. Moreover, one can find in contemporary economic theology the assertion that monopoly power exercized by labor unions is bad, and one of the prominent causes of persistent unemployment, whereas monopoly power exercized by large corporations is largely illusory. I am unable to conclude this essay without a

few remarks upon this topic, prompted especially by the recent work of Baumol and his associates on the subject of contestable markets (Baumol, 1982, 1985; Baumol, Panzar and Willig, 1982).

Baumol (1985, pp.315–16) provides this definition: 'a market is perfectly contestable if any entrant who changes his mind can exit without sacrificing any of the investment the entry decision required. For then the entrant risks nothing by taking advantage of any earning opportunity presented by the high price of an incumbent.'

Thus, perfect contestability effectively requires that 'hit and run' entry should be possible for any firm in the competitive fringe. The authors' favorite example seems to be that of airlines, with large fixed costs for each plane in the fleet, but flexibility (in the present deregulated state of the industry in the US) to adjust routes very quickly to take advantage of any overpricing by the incumbent airlines. The airline industry may be an extremely special case, however, and even within it there may be more impediments to hit and run entry than is required for anything like perfect contestability. For one thing, it takes airlines quite a while to earn a good reputation on a new route, and to build up passenger goodwill or loyalty.

The most plausible example of a perfectly contestable market, oddly enough, is a labor market. For unless a union or an association is granted special privileges under the law, which have the effect of placing a statutory restriction on entry into the trade or profession, it is surely in labor markets where hit and run entry is easiest, especially for unions of blue collar workers rather than for statutorily restricted professional associations of lawyers, doctors, etc. Yet there are many economists who claim that it is labor unions who abuse their monopoly power and cause unemployment by holding wage rates too high; many of those same economists seem too willing to suggest that the monopoly power of even the largest corporations is largely illusory, despite the obstacles to hit and run entry into the relevant industries.

The principal conclusions of this new theory of contestable markets are that all supernormal profits will be removed by the threat of hit and run entry, as will any choice of inputs which does not minimize total cost, and cross-subsidization of any of a firm's many different products which a potential entrant is capable of producing. Moreover, if an industry can sustain more than one competing firm producing a single common product, the threat of hit and run entry by new firms drives each of the two or more existing firms to charge a price equal to marginal cost, as in the usual theory of perfect competition.

This is a large body of work which does us the service of at last treating seriously the theoretical problem of how a monopolistic firm interacts with a 'competitive fringe' of potential entrants. Not that it is by any means the first work to do so. Nor is it the most coherent in its modelling of the sequence of decisions that are taken by the incumbent monopolist and the potential competitors, as should be clear from the conceptual problems faced by

Mirman, Tauman and Zang (1985) in placing contestability on more secure game-theoretic foundations. When time is continuous, the theory of perfect contestability requires easily reversible fixed costs to be clearly distinguished from sunk costs, and this distinction is by no means as clear as it might be (Weitzman, 1983). Nevertheless, I propose to ignore these objections – even quibbles, perhaps – and examine what seems to be the central thesis of the work, which is that perfect contestability, rather than perfect competition, is the appropriate standard by which to judge an industry, particularly an industry with average cost curves which are decreasing for at least some important set of outputs, so that in fact a Walrasian equilibrium may well not exist.

Now, I have already raised plenty of objections to *laissez faire* perfect competition even when all industries and all firms have convex production possibility sets. These objections apply *a fortiori* to perfect contestability in more general economic environments which may have non-convex technologies. It is rather more difficult, however, to contest a more sophisticated version of perfect contestability, which recognizes the general desirability of commodity taxation, as in Diamond and Mirrlees (1971). They and Hahn (1973b) and also Mirrlees (1972) have shown that, when optimal commodity taxes are being maintained throughout, then overall production efficiency is often desirable. Thus, when all technology sets are convex, the optimal organization of industrial production in the economy can be achieved by setting uniform producer prices for the inputs and outputs of all firms. These producer prices generally differ from consumer prices through commodity taxes and subsidies. Nevertheless, all producers should have marginal rates of transformation in production equal to producer price ratios, which implies, in the case of a firm which produces a single output commodity, that the producer price should be equal to marginal cost, when cost is also evaluated in producer prices. Thus one might think that, provided taxes are set optimally so that firms do calculate their costs and revenues in terms of suitable producer prices, perfect contestability might prove to be an appropriate generalization for non-convex environments of the Diamond and Mirrlees idea of having private producers act as if they are perfect competitors, facing producer prices.

There are a number of serious difficulties with such an argument, however. For one thing, even the original Diamond and Mirrlees argument only works when any profits made by firms are taxed either at the rate of 100 per cent or else some other optimal rate, equivalent to an optimal tax on the entrepreneurial services supplied by the owners of the firm, to which profits are the imputed reward. The attempted extension to firms with non-convex consumption sets is therefore not generally valid. Moreover, it is important that optimal commodity taxes be maintained; if they are not, the case for production efficiency becomes invalid even if all firms have constant returns to scale technology sets, as shown by Diewert (1983) and Hammond (1986b).

So the attempt of Baumol and his associates, to rescue *laissez faire* from those who object to apparently inefficient monopolies, fails because it is fundamentally misconceived. Perfect competition simply is not the right normative standard with which to judge industrial performance, even when all technology sets are convex, and so neither is perfect contestability when there are non-convexities.

There is a more subtle but much weaker defence of perfect competition available, to which I alluded back in Section 10. This is that perfect competition may well be unavoidable when the power of government agencies to monitor and to tax transactions is limited, so that an underground economy flourishes. The presence of small private corporations makes little difference to that argument. With significant economies of scale in some industries, however, there may not exist any Walrasian equilibrium in the underground economy. Then we face new problems that have scarcely been considered in the existing work on incentive constraints in general economic environments. It is very unlikely, however, that we shall see perfect contestability playing the same role in the analysis with non-convexities that perfect competition did when there were many agents with convex possibility sets. Hit and run entry, after all, is rarely possible in practice. Even if it were, government efforts to tax and monitor the transactions of economic agents are surely rather easier when at least one of the parties is a corporation that has grown large because of economies of scale. So is the administration of prices by a public body seeking to act in the public interest, as well as the taxation of price increases in an effort to check inflation, whenever prices are now administered by corporate managers acting in their own interest. The welfare economics of industrial organization is likely to be a much more complex topic than the theory of contestable markets suggests.

22 NEOCLASSICAL ECONOMICS NEED NOT BE THEOLOGICAL

> Progress is slow partly from mere intellectual inertia. In a subject where there is no agreed procedure for knocking out errors, doctrines have a long life. A professor teaches what he was taught, and his pupils, with a proper respect and reverence for teachers, set up a resistance against his critics for no other reason than that it was he whose pupils they were. (Robinson, 1962, p.76)

> 'I require all members of the class to have a personal daily copy of *The Wall Street Journal*. I advise them that The Journal will be the textbook for the rest of their professional lives.' (A named professor at a far from unknown American university, quoted in an advertisement for a scheme whereby professors of economics get a free subscription if they sign up seven or more of their class for reduced subscriptions.)

I have discussed some of the commonly used assumptions – more properly regarded as assertions, actually – which underlie a great deal of contemporary economic policy analysis. Far too many of them have been found to be untenable. The empirical assertions have little grounding in reality, especially when consumers are treated as individuals and firms are considered one at a time, rather than being aggregated together. Some assertions amount to ethical assumptions, yet are rarely recognized as such. When they are, these ethical assertions are also highly questionable. It is high time to purge neoclassical economics of such theology. But, if we do, will there be anything left? The last assumption which I shall discuss is that there can be. Of course, there is a danger of a paradox here, because the assumption that theology is inessential to neoclassical economics is itself almost a theological assumption. But if this difficulty were fatal, it would also be the case that value-free science of any kind is impossible.

The essential content of neoclassical economic theory is that individual agents follow regular predictable behavior patterns and that their environment adjusts to their decisions in a way that produces some kind of overall equilibrium. Joan Robinson was a strident critic of such theory for at least two reasons. The first reason was the patent unreality of most of the assumptions of neoclassical economics, which this essay has already discussed at length. The second reason was the use of neoclassical economic theory to support *laissez faire* economic theology which to her, as a disciple of Keynes, was obviously perverted. She was unable to see how neoclassical theory in any form could be disentangled from *laissez faire* theology. This is entirely understandable, since it is only some of the most recent developments in economic theory and in the theory of games which are beginning to make such disentanglement possible. This essay was concerned with some of them, but by no means all, since I chose to concentrate upon how Walrasian general equilibrium theory can be modified in order to relax some of the most contentious assertions underlying *laissez faire* theology.

As the discussion of Section 21 begins to make clear, however, there are still many problems in trying to escape from Walrasian theory, and deal seriously with the monopoly power of the modern corporation. It is probably this monopoly power, moreover, which will ultimately provide the best theoretical explanation for the Keynesian phenomenon of money wages and prices being rigid in the (very) short run, especially once it is recognized that price setters are no more exempt from bounded rationality than any other kind of economic agent (see, for instance, Kalecki, 1971; Nikaido, 1975; Negishi, 1979; Hart, 1982; Akerlof and Yellen, 1985b; and Roberts 1987). The problems of imperfect competition and of Keynesian disequilibrium were ones which Joan Robinson wrestled with all her life. My failure to discuss them more than I have reflects partly the fact that this essay is already long, but much more the inherent difficulties of these problems. It is just as well that Joan Robinson devoted herself to never allowing us to forget them

for long, as well as to making the theologically inclined as uncomfortable as possible whenever they tried to sweep such inconvenient problems under the carpet.

It is perhaps less fortunate that her legitimate objections to neoclassical ideology did not allow her to understand that some of us might still want to look for a residual neoclassical theory, purged of theology. In particular, she never really seemed to give due credit to Hicks' (1946) notion of temporary equilibrium, as brought up to date by Grandmont (1982, 1983) and others. This does allow history to have a role to play in determining the equilibrium outcome of the economy, and is not the usual sterile notion of a stationary state or long-period equilibrium to which she was quite right in objecting so strongly. Indeed, it seems that her justified hostility to the behavioral assumptions of standard neoclassical theory – unbounded rationality, unbounded foresight, etc. – was so strong that it completely blinded her to the possibility of having useful equilibrium models of an economy, particularly for purposes of prediction, without all the neoclassical baggage. And if this really is a failing, she would certainly have wished me to point it out – preferably long ago, when there would still have been time for her to respond – for as she wrote in the first volume of her *Collected Economic Papers*, dedicated to her pupils: 'I do not add the usual reservation to my acknowledgement to my pupils, for I think they should be held responsible for any errors that they have allowed me to maintain.'

Nor even are the recent harsh criticisms of Weintraub (1985) entirely misplaced, though they only tell a small part of the whole story. Contemporary economists cannot afford to forget what Joan Robinson stood for, unless they are content to remain as the slaves of business interests. Above all, our teaching of economics, especially of welfare economics, or of what is meant by good economic policy, clearly needs to depart from the present state, which is still far too often close to how Joan Robinson described it twenty-eight years ago in Bombay's *Economic Weekly*:

> The serious student is often attracted to economics by humanitarian feeling and patriotism – he wants to learn how to choose economic policies that will increase human welfare. Orthodox teaching deflects these feelings into the dreary desert of so-called Welfare Economics, a system of ideas based on a mechanistic psychology of a completely individualistic pursuit of pleasure and avoidance of pain, which no one believes to be a correct account of human nature, dished up in algebraic formulae which do not even pretend to be applicable to actual data. As he goes deeper into the matter, he reads some brilliant and subtle authors who debunk the whole subject and show conclusively that its methodology was inadmissible. For most, this is too bitter a pill to swallow and they desperately cling to some scraps of what they have learned because no other way has been offered of formulating the vague benevolent feelings with which they began.

The serious student was hoping, also, to learn something that would help him to make up his mind on the great question that lies open before all the developing countries. How far can private-enterprise capitalism be made to serve national ends? . . .

He soon begins to notice that, without any overt discussion of the question, he is being indoctrinated with notions soaked in a prejudice for *laissez-faire*. This is partly the result of a mere time-lag. Nineteenth-century economic teaching was built up round the conception of the merits of the free market, and in particular, of free trade (which at that time favoured British national interests, though it was damaging to India); the modern text-books are still much influenced by the masters of that period. It is partly the result of the choice of curriculum. A large proportion of his time is taken up by the theory of relative prices. The question of the distribution of *given* resources amongst alternative ends, subject to the condition that there is an equitable (and not very unequal) distribution of purchasing power among the families concerned, lends itself to exhibiting a free market in a favourable light; the student is required to work out exercises devised to show how, in these conditions, interference with the free play of the forces of supply and demand causes harm to the individuals who make up the market. All this is very complicated, and when modified by modern embellishments such as the theory of oligopoly and imperfect competition, may well occupy a year of lectures and reading. If the serious student has the hardihood to ask: But are resources given, and is income distributed equitably? he is made to feel foolish. Do you not understand that these are necessary simplifying assumptions for the analysis of prices? You cannot expect to do everything at once.

It is true that we cannot, in the time available, teach everything we would like. But why do we pick out for treatment just that selection of topics that is least likely to raise any questions of fundamental importance? (Robinson, 1965, pp.2–3)

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