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Macroeconomic Planning

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PREFACE

This book fails to satisfy two criteria which texts are normally supposed to obey. First, it is not the outcome of many years of careful working and reworking of some well-known theme and, secondly, the actual writing was most enjoyable from our own, possibly solipsistic, point of view. Lest our endeavours be thought worthless, may we offer a few words of explanation?

At the time of our first meeting, at the University of York in 1973, our research interests were somewhat disparate—labour mobility, law and welfare economics on the one hand and health, defence and econometrics on the other. By 1976, we found ourselves working together again, this time at the University of Nottingham, but now with teaching interests in macroeconomics and planning, respectively. Having approached these two areas from a common, essentially microeconomic, background, we found much of the conventional literature unsatisfactory for a number of reasons.

First, traditional macroeconomics texts tend to be mechanistic, abstract and (of particular importance from the practical point of view) lacking in any explicit treatment of the appropriate objectives of economic policy. Secondly, texts on planning tend to the opposite extreme, pursuing description of particular planning experiences at the expense of analysis. Thirdly, little account seems to be taken of the likely structure of the political process and thus of how the objectives of, and the constraints on, economic policy come to be specified. Fourthly, recent theoretical work on the microeconomic foundations of the macroeconomy has led to insights which cannot be ignored when discussing macroeconomics and planning in general. Fifthly, the distinctions made between different types of planning problems seem to us to be artificial and, in many cases, unhelpful.

With these points in mind, the prospect of a unified treatment of the central issues of both macroeconomics and planning came to suggest itself. We were concerned to develop a theoretical and applied framework which embraced both macroeconomics and planning and, in particular, which demonstrated the essential unity of all forms of macroeconomic planning by the consistent application of basic economic principles. We might note, incidentally,

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that, just as microeconomics normally sets out to establish an objective function, an opportunity set and thence an optimal decision in the partial sense, so we have taken macroeconomic planning to comprise a similar set of operations in a general context.

The book has been designed for an audience of third-year undergraduates and first-year postgraduates, who have taken courses in basic micro- and macro-theory. In addition, some knowledge of mathematics and statistics has been assumed, although any deficiencies on the part of the reader in this respect should not constitute too serious an obstacle to understanding. We also believe that certain sections of the text might be accessible to second- or even first-year undergraduates.

A simple 'thank-you' seems insufficient to repay the enormous intellectual debts which we have accumulated. Nevertheless, it must suffice and we extend our grateful thanks to the following:

friends and colleagues at the University of York for a stimulating environment which has had a lasting influence. In particular, we should like to single out and express our sincere thanks to our respective mentors, Alan Williams and Jack Wiseman;

colleagues and students of both the Economics and Industrial Economics Departments at Nottingham, for providing the fertile atmosphere necessary to produce a book of this nature;

Professors Charles Carter and Jack Parkinson for invaluable comments and encouragement during the preparation of the manuscript, and Paul Godwin for helpful comments on Chapter 5;

Yvonne Rogers for the efficient translation of our unintelligible drafts into a neat typescript;

Sue and Yvonne, for their extraordinary capacity for patience and understanding, and for generally being nice.

At the beginning of the Preface, we observed that the writing of this book was, in itself, an enjoyable experience. With this in mind, we should like to thank each other. Joint authorship is particularly susceptible to breakdown, especially when one author finds his favourite phrase has been censored by the other. In spite of this, or perhaps paradoxically because of it, we find our friendship unimpaired and we are willing to accept collective responsibility for all parts of the book, as long as we are both in the room at the same time.

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CHAPTER 1

Macroeconomics and Planning

From the point of view of economic organisation, Robinson Crusoe must have been fairly happy on his desert island. His world was a simple agricultural one and was therefore, to a large extent, under the control of the elements and divine providence. Furthermore, at least until the arrival of Friday, he had only himself to please.

Compare this situation with that of present-day industrial society. First, whilst Crusoe's economy was restricted to the output of corn and goats, modern economies are capable of producing an enormous variety of consumption and production goods and services. Secondly, with the establishment of legal systems and methods of economic policy, extensive facilities for the control of the economic system came into existence, independently of Crusoe's more natural controls. Thirdly — and possibly of the greatest significance — societies now comprise, not one (or two) members, but many millions of individuals, each with their own particular views regarding the appropriate allocation of resources, distribution of rewards and so forth. The fundamental economic problem of relating commodity demands to supplies is therefore immeasurably more complex; in that the system is more complicated, it is also presumably more prone to chaos.

With the development of large-scale industrial societies, mankind has employed a number of organisational forms and economic techniques in an effort to ensure that order is maintained. In this book, we shall be concerned with just one particular method — macroeconomic planning — which we feel is of great relevance to the provision of a solution to the economic problems of the contemporary world. Starting from first principles, let us establish a few definitions.

We take the term 'planning' to refer to a purposive, means — ends process and we may define it as the deliberate manipulation of the parameters of a system in order to bring about a desired and

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specified alteration in the operation of the system.¹ The implications of this definition may be demonstrated by a simple, if slightly facetious, example.

Consider a mechanic on the forecourt of his garage; in front of him stands a motor-car (a mechanical system) with its engine running. Let us now persuade our mechanic to plan some action to influence the functioning of this system and follow his line of reasoning.

In the first place, to borrow some sociological terminology, the mechanic will 'define the situation'; that is, he will observe the system as it currently functions. In our case, he will presumably say: 'I observe a car with its engine running.' The mechanic's second step is to compare his observations of the prevailing situation with the way in which he would like to see it develop. Let us suppose that he now says: 'I want the engine to stop,' and we now have a state of affairs in which the operation of the system conflicts with the wishes of the mechanic. At this stage, our hero might well retire from the forecourt to engage in a spot of thinking. 'What strategies could I pursue', he might ask, 'to influence the system according to my wishes? As an initial option, I could ignore the engine and hope it stops by itself, although experience suggests that this is unlikely to happen. Alternatively, I could drive the car into a brick wall. All things considered, I believe that the best approach, in terms of the highest probability of success, would be to throw a spanner into the works.' Thus convinced, our mechanic returns to the car, wields his spanner and, lo and behold, the engine stops.

Let us summarise the main points of the mechanic's approach. First, he observed and understood the situation confronting him and, secondly, decided that its likely progress did not accord with his wishes. Thirdly, he used his knowledge of the system's functioning to design a strategy which could realise the state of affairs which he desired and, finally, he perpetrated the required action. These principles are, as we shall see, inherent in the planning of the macroeconomy.

¹ To make this definition crystal-clear, we may define a 'system' as a set of inter-related elements. As regards the definition of 'parameter', consider the derivation of a demand curve. When constructing price-quantity relationships, it is customary, for example, to hold income levels constant on a particular occasion, allowing a unique demand curve to be derived. However, on a different occasion we may permit income to be constant at a different level, thereby producing a new demand relationship. This specifically constant but generally variable entity is termed a 'parameter'.

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Three complications may now be added to our simple model. In the first place, what could be inferred if the engine did not in fact stop? We should be forced to conclude that some unforeseen factor had come into play, or even remind ourselves that spanners do not necessarily have any effect when thrown into works. In other words, our mechanic either (1) had an inadequate knowledge of the operation of the system with which he was concerned or (2) the implement used to manipulate the parameters was inappropriate; the implications of both are the same. The plan was therefore unsuccessful but, given the *ex ante* specification of objectives and the deliberate perpetration of the action, we should still call it a plan *per se*. It is, incidentally, likely that the failure of this plan will contribute to the knowledge of the mechanic for use in future plans.

Secondly, suppose that the car's owner now appears on the scene and remonstrates with our spanner-throwing mechanic regarding the mistreatment of his engine. The former makes it clear that all he really required was that the engine be slowed down and not actually stopped. We should therefore deduce that the mechanic had mis-specified the objective of the exercise; he had interpreted it as 'stop the engine' whereas the correct desire on the part of the owner was 'slow the engine down'. In this case, that which succeeded was a plan, but it was the wrong plan!

Finally, we should note that the occurrence of an action does not, of itself, constitute grounds for the belief that it was planned. In our case, we can only be sure that the violent insertion of the spanner was a planned action if our mechanic specified his objective *ex ante* and if he believed his deliberate actions to be potentially influential upon the attainment of his objectives. These two provisions clearly constitute the necessary conditions for 'planning'.

Turning now to a consideration of 'macroeconomics', the economist's conception is traditionally of the following form:

““Macroeconomics” is, of course, to be distinguished from “microeconomics”. Macroeconomics deals with economic affairs “in the large”. It concerns the overall dimensions of economic life. It looks at the total size and shape and functioning of the “elephant” of economic experience, rather than the working or articulation or dimensions of the individual parts. To alter the metaphor, it studies the character of the forest, independently of the trees which compose it.” (Ackley, 1961)

Macroeconomics, in other words, is about aggregates. According

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to this definition, the macroeconomist is concerned, for example, with the economy's, rather than the individual's, consumption levels or with national, rather than individual, labour power.

Although this text will be dealing primarily with economic activities 'in the large', we should not lose sight of the means by which macrovariables are generated; as we shall see, this means is of great importance to the construction of economic plans. Macrovariables do not exist as autonomous entities; they are, in reality, the aggregation of all the economy's microvariables. Whilst, in certain instances, we might find it expedient to consider these macrovariables as quasi-autonomous, on the justification of some 'law of large numbers', we must not forget that such an aggregate is really the net result of individual, microeconomic actions. If we were to devise a plan for the steel industry, for example, we should have to consider the output of steel both as an entity in itself and as the sum of the outputs of the individual steel plants — outputs which clearly influence the total. Given that causality runs from the micro- to the macroeconomy, we accordingly think of the latter as an inter-relationship of microeconomic elements. To borrow the Ackley metaphor, the felling of just one tree in the forest does not destroy the essential characteristic of 'forestness'. However, it does make our forest a different forest, with the result that it will be necessary to treat the macroeconomy both as a 'forest' and as a 'collection of individual trees'.

Having examined both components of our title, we are now in a position to produce a definition of 'macroeconomic planning', namely, the deliberate manipulation of the parameters of the economic system to bring about a desired alteration in the functioning of the economy. Our general discussion has also indicated the sorts of areas to which aspirant planners must pay attention. More specifically, the economic-planning process must come to terms with five basic requirements and, during the course of this book, we shall be dealing with each in some detail.

Intervention requirement. Can the desired alteration to the economy be brought about by the 'natural' or inherent processes within it, or is some external influence required to determine our result? Is there, in other words, a 'need' for planning?

Political requirement. How do we, as members of society, come to decide upon and specify the aims of the plan? To return to our earlier example, how do the car owner and the mechanic come to agree upon, and clarify, the objective of the exercise?

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Technical requirement. How do we obtain the necessary knowledge of the economy in order to (1) observe the relevant features of the current situation, (2) understand the overall workings of the system, and (3) select the appropriate policy instrument or operational technique for the realisation of our objective? Again, in terms of our example, is a spanner the 'best' tool to use under the circumstances and, if so, where into the works should it be thrown? In the real world, this requirement will involve us in the theoretical simulation of practicable alternative strategies which describe a number of possible results, in order to provide us with an *ex ante* estimate of the likely outcomes of the planning decision. These may then be related to our stated aims to provide a guide to the appropriate choice of action.

Implementation requirement. How is the chosen theoretical strategy actually applied in practice? What institutional decisions are necessary for its implementation?

Feedback requirement. How does that which has been achieved relate to our original specified objective or, did the engine stop and, if not, why not?

In spite of the increasing attention currently being paid to the methods of economic planning, it is clearly untrue to say that the latter has always been at the forefront of man's mundane activities. In reality, its importance has been dictated by historical circumstance, in terms of the particular epistemological views of the societies concerned. To illustrate this point, and in order to demonstrate the nature of the ideologies involved, a return to the Ancient World should prove instructive.

The writings of the Socratic School — essentially Plato and Aristotle — are amongst the earliest systematic views on economics with which history has endowed us. Economics for the Socratics was a 'teleological' process, in that it concerned itself equally with the means of attaining a particular end and also with the nature of that end itself. Plato's *Republic* is amenable to interpretation in this way, for it consists of a discussion of the appropriate objective of society ('justice'), followed by an analysis of the form of political and economic organisation necessary for the achievement of this end. Clearly, an approach of this kind could be construed as 'planning' in our sense of the word, and it is indeed Aristotle who first provides us with a clear and succinct planning methodology:

'All men seek one goal: success or happiness. The only way to

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achieve true success is to express yourself completely in service to society. First, have a definite, clear, practical ideal — a goal, an objective. Second, have the necessary means to achieve your ends — wisdom, money, materials, and methods. Third, adjust your means to that end.' (Quoted in Thomas, 1970)

As the student of the Socratic dialogues will recall, this school of thought did not possess a monopoly on interpretation in the Ancient World. Of its many rivals, the most interesting from our point of view is the Sophist school:

'The manner in which economics was taught by the Sophists has a strong affinity with the approach which has come to be dominant in the twentieth century. In fact, their approach is much closer to that of the majority of modern professional economists than are those adopted by Plato, Aristotle and the Scholastics. For the Sophists, economics is a technology. Its techniques can be taught and mastered without reference to the desirability or lack of desirability attached to the ends or purposes which the technique can be made to serve. The discipline can be applied, for example, to increase the affluence of a particular household or a particular state. However, the question as to whether the form of affluence is worth acquiring is not a question with which economics is concerned.' (Gordon, 1975)

An important distinction between these two methodologies clearly lies in the status of the objective function; in the former approach, the search for the appropriate objective is an integral part of economic analysis whilst, in the latter, this is not deemed to be a question to which the subject may legitimately address itself. As we shall see, these two opposing views are inherent in the planning debate of the present time.

With the eclipse of the Ancient World, political economy — the relationship between human society and its material wealth — began to develop in new directions, as a reaction to man's changing perception of his social and economic environment. The actual causes and mechanisms of this evolution need not detain us here but, suffice it to say, we find that seventeenth-century Western philosophers such as Hobbes, Spinoza, Grotius and Locke, produced very different analyses from those developed by the Socratic school. At the risk of overgeneralisation, the orientation of these scholars was less towards 'social man' in the manner in

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which he had been conceived by Aristotle; rather, society was seen as an aggregation of individuals and existed solely to maximise the potential for personal liberty. In terms of the evolution of mainstream economics, the interpretations of Hume, Smith, the Mills, Bentham and the like, provided all that was necessary for a theoretical justification of the then-evolving capitalist system. In such an environment, the ideas behind the planning methodology were really nonstarters, as the famous 'invisible hand' was seen to be in perpetual operation to ensure that social welfare was maximised by individual behaviour.

The interest in economic planning which twentieth-century man now displays may be ascribed to two alternative causes, namely, (1) the view that planning is a logical corollary of increasing state intervention within the capitalist economy, and (2) the view that the capitalist system is inherently incapable of adequately meeting the requirements of social preferences. We shall now review each of these alternatives in turn.

Although the nineteenth-century socialist writers such as Marx generally regarded the United Kingdom as the most 'capitalist' of capitalist nations, a total reliance had never really been placed upon the free-market economy managed by its 'invisible hand'. Indeed, throughout its history, the UK economy has been the subject of a variety of forms of state intervention, the purpose of which has been to modify or supplant the functioning of such markets. When wars became too expensive for the purse of the individual monarch for example, kings were obliged to raise funds in a number of ways, such as taxation and borrowing, and this is one of the reasons for Wilson's reference to the seventeenth century as 'an age of debts and taxes' (Wilson, 1965). Regulations regarding the remuneration and employment of the labour force were certainly in existence long before our 'capitalist' theorists ever wrote, examples being the numerous Statutes of Labourers during the 1350s to 1370s which attempted to fix wages and restrict labour mobility. Even the nineteenth century, the so-called 'Age of *Laissez-Faire*' which supposedly represented a total divorce between political and economic activities, saw a considerable amount of intervention in, particularly, social matters on the part of the State (Taylor, 1972).

The degree of state intervention has progressively increased over time although, until the twentieth century, such growth had in fact been brought about by the accumulation of piecemeal legislation. Intervention took place on an *ad hoc* basis, when a particular

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emergency arose or when a particular interest group found itself threatened; examples of such forms of intervention include the introduction of the income tax in 1799 in order to finance the Napoleonic Wars, and the 1624 Monopolies Act which established the existence of patent rights to protect inventors. By and large, the other nations of the West were simultaneously experiencing similar forms of state intervention.

'The defenders of competitive capitalism had always argued that by the rational pursuit of self-interest the general good would be most effectively attained; that the laws of supply and demand in a free-market world would ensure the maximum production of wealth.' (Thomson, 1957)

This truth was taken to be self-evident, even allowing for state intervention to iron out the occasional market imperfection. By 1945, however, the faith of all but the most stalwart had been shattered as the capitalist world had by then been shaken by a number of crises of a far greater magnitude than had been previously experienced. First, the West had involved itself in two major wars which had necessitated the centralisation of command over resources to efficiently direct the war effort. These war-inspired interventions left their marks on the peacetime economies in many ways, including greatly enlarged public sectors and greater numbers of formal government controls. Secondly, it was clear that the free-market system had in no way prevented the serious interwar depression and, furthermore, might even have precipitated it; rather, it was only positive government action which seemed to provide any solutions to the obvious disequilibrium. As Thomson has concluded:

'Trust could no longer be placed in the capacity of any providential mechanism to regulate itself. Deliberate acts of policy and assertion of moral purpose seemed the only alternatives to anarchy in politics and chaos in economic life.' (ibid.)

To many observers, planning appeared to be the natural successor to interventionist capitalism; all that was necessary was a systematic rationalisation of the various *ad hoc* arrangements which the state had already made, arrangements which now existed in sufficient number and strength to serve as an effective force for economic control. The manifest failures of capitalism in

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the 1930s also led many to believe that it was the state, and not the entrepreneur, which had the superior notion as to the proper constituents of social welfare. With these points in mind, France formally instituted a planning system in 1946, whilst a number of other European nations including the United Kingdom began to experiment with a variety of planning procedures at both a macro- and a microlevel. Amongst the countries of the 'Third World', India drew up its first plan in 1950.

Our second alternative cause, the view that the capitalist (or, in some cases, the prevailing feudal) system is inimical to the appropriate development of social welfare, has recently found favour in such countries as the Soviet Union, China, the nations of Eastern Europe as well as a substantial part of the 'Third World'. In these cases, political and economic revolutions have paved the way for the establishment of 'socialist' societies, whose principal characteristic is the social ownership of the means of production (capital, land etc.). Societies of this persuasion are a twentieth-century phenomenon and, as we shall see, their commitment to economic planning is explicit. As they appear anxious to reinstate a form of the Socratic 'social man', we should expect Aristotle's dictum to be well received in both Moscow and Peking.

The Modern World is therefore displaying an increasing interest in planning. The process will, however, assume a particular degree of significance in a given economy, depending upon the degree of alteration to the system required and the number and range of parameters to be controlled.

'... some would-be planners envisage 'planning' primarily as a conferment of regulative power over each industry on some organisation representing the capitalist businesses engaged in it, under no more than a very general control exercised by the state in the general interest; while others insist that planning involves not merely the separate organisation of each industry into a co-operating group, but a right adjustment between industries and a social direction of the distribution of labour and capital between alternative uses. One set of planners, again, regards planning as a means of so reorganising capitalism as to give it a new lease of life; while another looks to it as a means of replacing capitalism by social ownership and operation of industry.' (Cole, 1937)

The conclusion to be drawn from this historical review is that most modern societies appear to have generated a 'need' for planning; the next chapter serves to prove that this is indeed the case.

CHAPTER 2

The Need for Planning

THE CAPITALIST MODEL

The following sections establish a simple model of the manner in which capitalist markets operate. The main reason for setting about such a task is not purely to devise a means by which (any) capitalist economy may be characterised, but to go further and show that the central workings of market mechanisms may be susceptible to imperfections of various kinds. The importance of such a demonstration lies in the implications for government intervention generally, and for economic planning in particular. If it can be shown that there are properties intrinsic to certain markets or classes of markets that impede the achievement of an appropriate equilibrium, we have *prima facie* grounds for supposing that government has an important role to play in the operation of the economy. Before investigating the forms that any such actions should take, it is necessary to demonstrate that action of some kind is, in fact, essential.

Prices constitute the device through which offers to buy and sell goods are mediated. The first task, then, is to examine how prices are set, how they are adjusted and whether their adjustment might be expected to lead to an equilibrium between supply and demand. This is done in two stages, the first being to describe the basic Walrasian model in which an Auctioneer is introduced. The second stage is to examine ways in which this fictional Auctioneer can be eliminated. An understanding of both stages is a prerequisite of a thorough understanding of why capitalist markets may not, without active guidance, constitute the most effective means of allocating resources.

THE BASIC MODEL

Let us consider an economy comprising z goods and services ($j = 1, \dots, m; m + 1, \dots, z$) and n individuals ($i = 1, \dots, n$). The first m items of goods and services are used as consumption items,

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whilst the remaining $(z - m)$ refer to services provided by the consumers for use in production. The quantity of the j th good or service bought or sold by the i th individual is denoted by q_{ij} , amounts supplied having a negative sign and amounts bought a positive sign. If we think of goods $(m + 1)$ to z as being amounts of different sorts of labour, then q_{ij} ($j = m + 1, \dots, z$) will represent the amount of labour of type j supplied by individual i , whilst q_{ij} ($j = 1, \dots, m$) will represent the amount of the j th consumption good that he buys.

A barter system in such an economy would be unwieldy if the number of individuals and/or the number of goods were large owing to the number of potential transactions. We normally find that such societies introduce money in order to facilitate exchange, since this device enables citizens to economise on the number of contacts (and contracts) they have to make when buying or selling a good. Thus, we shall assume that money is used as a medium of exchange in our models, enabling all price ratios to be expressed in a common unit of account. Money will not be allowed to function as an asset in our scheme, even if it is sometimes regarded as so doing in most monetary economies (Laidler, 1969).

The standard economic problem now is to find a price for each good that will ensure equality between supply and demand. We are looking for a price vector that will just clear all markets simultaneously, that is, a set of prices p_1^* to p_z^* , more conveniently written in the formal notation p^* . In general, any of the many possible sets of prices may be denoted as a vector p . In the formative work on this problem in the nineteenth century, Walras (1874) invented a fictional character, the Auctioneer, who is put in charge of coordinating the economy's efforts to find an appropriate price vector. This Auctioneer proceeds by calling out alternative price vectors within earshot of all members of the economy until he finds one at which everyone's plans mesh.

Each member of the economy, when he hears a price vector called out by the Auctioneer, chooses how much of each good and service to demand or supply. At a given set of prices, a person may have too much of some goods (such as their own labour time) and will offer the excess to the market. Similarly, they will make offers to the market for those goods of which they have insufficient at current prices. These activities may be analysed within the conventional utility-maximising model.

An individual is assumed to be able to assign a real number to all possible combinations of labour supply and product consumption.