R.J.Ball

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PREFACE

This book seeks to provide a theoretical background to the analysis of inflation for third year specialists in economics and first year postgraduate students. The prerequisites are sound first courses in microeconomics and employment theory, normally covered in the first two years of undergraduate study.

The subject matter contains much that is highly controversial in professional circles, particularly as it has been orientated primarily toward the problem of inflation as it has manifested itself in the major industrialized countries since the Second World War. Almost inevitably the shaping of the material and the perspective developed is more subjective than it would be in covering other aspects of macroeconomics. For this I make no apology, for the alternative is to baffle the student with taxonomy which leaves him with few guide lines to help him formulate views of his own. To avoid this I have also resisted the temptation to proliferate a host of alternative models of inflation, and have concentrated on extensive discussion of the theory that underlies the relevant macroeconomic relationships. Much of the material is applicable to more general courses in macroeconomics that are not focused primarily on the general price level, but which place greater emphasis on employment and monetary theory. As the title of the book signifies, I have gone to some lengths to consider the role of the stock of money in the theory of inflation. This is firstly because I believe that it is helpful and important to attempt some synthesis between contemporary ideas about inflation and more traditional theories in which money was important, and secondly because contemporary analysis has relatively little to say on the subject.

A number of friends and colleagues were kind enough to read the book in draft, either as a whole or in part, and my debt to them cannot be overstressed. I am grateful to M. E. Beesley, R. G. Bodkin, D. J. Coppock and N. J. Gibson who read the first draft in its entirety and provided detailed comment and constructive criticism. C. F. Carter and Shirley Lerner made valuable suggestions with regard to Chapter VII and discussions with B. R. Williams were of great assistance in writing Chapter VI. I am also indebted to R. C. O. Matthews who acted as a final reader, and

enabled me to add improvements at several points. James Tobin generously made available a typescript of his book on monetary theory and policy which influenced the preparation of Chapter VIII. Shortcomings and omissions remaining are of course solely my responsibility. It is a pleasure to record my debt to Winifred Atkinson, Pauline O'Brien and Kathleen Deignan who typed the manuscript in its various stages, coping with handwriting that is usually close to being illegible.

November 1963 R. J. B.

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PART I

CHAPTER I

The General Price Level

Introduction

The principal concern of this book is to set out the elements that enter into the problem of analysing inflation. In the light of this aim it would seem appropriate to begin by defining the concept of inflation itself. Unfortunately, as others have found, it is not easy to start with any great precision. Why is this so?

Economic literature is full of words and expressions that confuse because they are not always used to refer to the same things or to characterize the same states of affairs. Economists use many common words or expressions that reflect considerable emotive overtones. It is not difficult to read into the analysis of neo-classical economists that on the whole 'competition' is good and 'monopoly' is bad, and the very adjective 'competitive' often carried implied approval. Similarly, we find that other adjectives like 'static' and 'dynamic' also possess emotive appeal; static analysis is limited and by implication somewhat outmoded, while analyses that are dynamic are regarded as forward-looking and alive to contemporary thought.

Both these kinds of difficulty complicate the problem of defining inflation. To begin with, inflation on the one hand and deflation on the other are not always used in such a way that they imply anything about prices. A deflationary situation may be associated with a fall in money income and rising unemployment, even though prices remain constant. The adjective 'deflationary' is commonly used in this way, but it is less common to use 'inflationary' to describe the reverse state of affairs. In the latter event the most likely description is reflationary, which describes a period of recovery from depression. While, therefore, the notion of inflating the economy may sometimes refer to a situation where money incomes are rising after depression, in the main the word inflation is reserved to indicate something not simply about money incomes but also about prices.

Even if we agree that an inflationary situation is to be taken to imply something about prices, precise definitions vary between individuals. Part of the difficulty here is that definitions of the more popular variety such as 'too much money chasing too few goods', not only purport to define inflation, but also imply something more about particular inflationary processes. (This particular definition originates from a rather specific view about the relationships between money, the supply of goods and their prices which as we shall see later is not easy to swallow in its simplest form.) The general point about such definitions is that they are not sufficiently neutral to be useful, for they depend on certain contingent propositions that are likely to be disputed. One is in danger of being bogged down in argument doubly confused by a failure to distinguish clearly between matters of fact and analysis, and by matters of definition.

It may seem plausible to assert that at least one necessary condition for a situation to be described as inflationary is that prices—in a sense to be considered later—must be rising. Unfortunately, even this is not regarded as true in general. It may be the case that strong economic forces within the economy at a point of time are restrained by artificial controls administered by the authorities operated in such a manner as to prevent a rise in prices. The essential point here is the extent to which such controls are regarded as temporary or artificial, for there are always some controls exercised by the authorities that relate to hire purchase conditions, interest rates and taxes, whose removal might result in a rapid rise in prices. But in practice we should not always regard the situation as inherently inflationary when these controls operate, so that there is always an arbitrary element involved in deciding on whether to regard a situation as inflationary or not when prices are not actually rising. Given a standard frame of reference, and if it is agreed that prices are not rising because the economy is not being allowed to function normally, we have a state of affairs sometimes described as being one of *repressed* as opposed to *open* inflation. A necessary condition for open inflation is that markets for goods and factors of production are allowed to function freely, setting prices of goods and factors without abnormal interference by the authorities.

The analysis of repressed inflation has been particularly relevant in periods such as the late 1940s, when by the use of licensing, price controls and subsidies, the economic authorities in some countries attempted to interfere with the free inter-play of market mechanisms. The principal motive for this was the belief that if such controls had been removed the change over from a war-time to a peace-time econ-

omy would have resulted in an excessive rise in prices. Many of these controls that had been an inherent part of the war economy had been introduced to prevent excessive increases in prices during the war. In the event, neither during the war nor after it were such controls wholly effective in preventing prices from rising, but there is little doubt that over the period they modified the price rise that took place. This is not necessarily to say that they were successful in reducing the rate of price increase over a longer period, for some economists have been inclined to say that they simply postponed the evil day when other so-called natural economic forces worked themselves out. But this is a matter of some dispute.

This book will not be explicitly concerned with the analysis of repressed inflation in the narrow sense just described,[1] but with the problem of inflation in a given institutional framework in which decision units are free to set prices, demand and supply products, and fix rates of remuneration of factors of production. We shall regard the case of repressed inflation in a narrow sense as a special one that lies outside the scope of our inquiry.

Thus we start with the view that inflation in our sense implies that prices are actually rising. This raises two questions; firstly what do we mean by rising prices and secondly if prices are agreed to be rising are all such increases to be regarded as symptomatic of an inflationary situation? Any set of definitions we adopt and therefore the answers to these questions must inevitably involve a distinct arbitrary element. We shall be concerned most with the concept of the general price level, and the analysis will on the whole fall into the context of macro-economics, as a result of which it is appropriate to consider rising prices in terms of some *measure* of the general price level. Rising prices must be thought of here as reflected in some average of all prices, which in turn raises difficulties that are briefly discussed in the next section. Nor do our problems end there, for given our chosen measure of the general price level it is necessary to define an inflationary situation in terms of it.

The simplest approach is obviously to define a situation as inflationary if the general price level is rising. But this raises questions of two kinds. Firstly, should a recovery of prices on the upswing of the business cycle be regarded as constituting an inflation? If prices have fallen well below their trend levels as a result of severe depression,

[1] Some writers extend the definition of repressed inflation to include situations where producers voluntarily set their prices at levels below those that will clear the markets for their products. By repressed inflation in a narrow sense we wish to exclude this case which results as a matter of choice by free market agents.

their restoration to the trend level may be regarded simply as a restoration of the *status quo*. A more specific question is related to the problem of emotive meaning that was raised earlier. Traditionally the word inflation has been surrounded by overtones of strong disapproval and fear, such that to describe a situation as one of inflation was implicitly to disapprove of it. The reason for this is partly that the neo-classical economists tended to think of inflation as essentially a situation in which the general price level was rising very rapidly and so the value of money declining precipitously, with the ultimate fear of what we would call hyper-inflation and the complete collapse of the currency. In this context, increases in the general price level came to be regarded as inflationary, depending on the rate of increase of the price level per unit time (though it was hardly ever stated as such) and the extent to which the source of the price increase was regarded with approval or disapproval. From this point of view the upward movement of the general price level on the upswing of the business cycle might not be regarded as evidence of an inflationary situation.

Secondly, to what extent may an inflationary situation be diagnosed by considering the trend of the general price level over some specified period? The choice of period is in itself inherently arbitrary while the actual choice of time period may often affect the final conclusion. This may be dealt with in a number of ways. The first is to display a certain amount of impatience with the problem of definition and to argue that inflation is a situation in which prices are rising and while admitting the inherently arbitrary character of specific choice, assert that an inflationary situation is a function of two principal factors, the rate of price increase and the duration of the increase, with the assumption that the faster the rate of price increase and the longer the duration of rising prices the more appropriate is it to define a situation as inflationary. Thus inflation may exist during any given period if the rate of price increase is fast enough, while it may also exist for any given rate of price increase if it persists for sufficiently long. What is meant by 'fast enough' and 'sufficiently long' becomes a matter of choice and agreement that must at the margin be arbitrary. A second approach is to assert that all increases in the general price level represent some species or other of inflation, to which a qualifying adjective must be added, so that we have for example, cyclical inflation, secular inflation and hyper-inflation. Again, however, we cannot escape an essentially arbitrary choice at the margin: for example, at what point do we pass from secular to hyper-inflation? In all these cases it is likely that in practice sufficient agreement would be forthcoming that would enable us to reach a decision that could be applied to statistical

data, so that while in principle choice at the margin is arbitrary it is in practice easier to reach agreement about how to describe a given situation than *a priori* reflection might suggest. The third possibility that has much to recommend it is to abandon the extensive use of the term inflation and fall back to discussing the behaviour and determinants of the general price level. This is certainly the most general approach, and in large measure this is what is done in much of this book. Nevertheless, to abandon the concept of inflation altogether is inconvenient in a number of respects for it involves one in an excessive amount of circumlocution in discussing established ideas and literature. As far as possible we shall discuss the problem of determining the level and movement of the general price level; it will often be necessary to describe a situation of rising prices as being one of inflation, and in most cases the particular form of inflation, or appropriate qualifying adjective that needs to be applied, should be clear from the text.

The Concept of the General Price Level

The general price level must be regarded as an average price of some kind, which raises the question of what prices to use and how they are to be 'added' together. Problems of this kind have a fairly long history in monetary economics, where they have appeared in the context of trying to determine the 'value' of money, or to define the purchasing power of a particular monetary unit. It soon came to be realized that in practice such difficulties cannot be wholly resolved, for we find ourselves in the middle of a general class of what are often called index number problems. The most convenient mode of representation of a single price over time in many respects is to express it as a percentage of its value in some given year. If a particular price is given the number 100, it is implied that it is 100 per cent of (or identical with) the price obtaining in that given or 'base' year. If the value is 100 in 1948 and 115 in 1950, then we may say that the price has risen 15 per cent between 1948 and 1950. When we turn to the general price level, however, complications arise because the general price level is to reflect the behaviour of many prices and we have in some sense to add them up. Since all prices are not equally important it is usually felt necessary to represent the general price level as a weighted average so that the movement of an individual price contributes to the movement of the whole in proportion to the importance with which it is regarded. In theory matters are complicated by the fact that the choice of weights is not in general unique, and different sets of weights lead to different numerical assertions about how much the

general price level has altered between two points of time. But in practice this is not unduly restrictive since different methods of weighting often have little effect on the broad qualitative conclusions about price behaviour that may be reached by consulting alternative price indexes.[1]

The statistics available for advanced industrial economics usually include a variety of different price indexes, such as the wholesale price index, the retail price index, cost-of-living indexes and implicit deflators of various components of national expenditure. The first three groups are usually calculated directly. The wholesale price index represents the prices received by wholesalers, while the retail price index reflects prices paid by final consumers. In practice these indexes, particularly in inflationary periods, often move closely together, but some economists feel strongly about the significance of one rather than the other in the context of the analysis of inflation. It is possible to argue that wholesale prices exhibit greater sensitivity to changes in economic conditions than retail prices or cost-of-living indexes. On the other hand retail prices and cost-of-living indexes may be regarded, as we shall see later, as important influences at the wage bargain in industrialized economies.

Implicit deflators of various components of national expenditure are obtained by valuing the quantities included in a component in a given year by a base year set of prices and then dividing this measure of expenditure at 'constant prices' into the current value of the quantity of output. In this manner we obtain a 'price' index of Gross National Product, of National Income, of total consumption and so forth. The Gross National Product deflator plays a special role here, for it probably comes closest to representing a general price level index for the economy as a whole.

The general price level, however defined, is inevitably a statistical construction. If the general price level is measured at 100 in 1948 and 115 in 1950 this leads us to say that prices on the average have risen about 15 per cent between 1948 and 1950, but of course no single price may have exhibited this behaviour; some will have risen more, some less and others may have fallen. The significance of our statement about the general price level is therefore not only limited because it is a statistical average of prices that has risen but also by the relative dispersion of price movements within the average. Again as a matter

[1] Of course it is possible that they all move together to deceive. Standard price indexes do not take quality changes into account, and it has been argued that when they have shown an increase in the price level, improvements in quality have sometimes been sufficient to reduce or eliminate the 'true' price rise.

of fact, many prices often move together over time, because they are subjected to a variety of common pressures. It is this that justifies our treatment of the general price level as a single price for many analytical purposes.

As we have remarked, we shall be concerned throughout this book, for the most part, with macroeconomic analysis. This means that we deal with aggregate concepts like national income, consumption, investment, the supply of money and the general price level. For present purposes we shall justify the use of such concepts on grounds of expediency. Our prime concern will be with inflation as a problem of the economy as a whole, and to avoid aggregate analysis would render the problem far too complex. This is not to say that we shall deal with the national economy at all times as an integrated entity or single sector, but we shall throughout be preoccupied with problems of economic behaviour at relatively high levels of aggregation.[1]

The Problem of Inflation

Economists during the inter-war period were highly preoccupied with the problem of unemployment. The first decade and a half after 1945 was one of rising prices and comparatively low levels of unemployment, during which increasing attention was paid to the problem of why prices rise, and what should be done to prevent them rising. Most discussion has implied that prices should be prevented from rising but fails to set out a clear case as to why. It seems to be usually accepted as *prima facie* obvious. However, in more recent years there have been hints that price stability may not in itself be so obviously desirable, if it conflicts with other objectives such as the rate of growth.

The traditional fear of inflation is associated with the notion that its prime cause is an over-expansion in the supply of money. The avoidance of inflation was taken as a prime objective of banking and monetary policy, for in an economy where money was a major store of value, the avoidance of inflation became inextricably mixed up with sound finance, and the defence of capital and property. The principal fear was one of hyper-inflation and the collapse of the currency, but was for the most part unrelated to the kind of situation that characterized the majority of the industrialized economics in the post-Second War period in which prices rose more or less steadily over a considerable period, without any signs of degenerating into a run-away gallop. The experience of this period may be aptly described as one of creeping inflation. The dangers of monetary insta-

[1] For a simple introduction to the economics of aggregates see F. S. Brooman, *Macroeconomics*, Allen and Unwin, 1962, Chapter 1.

bility leading to hyper-inflation are indeed obvious in a free enterprise economy for they tend to undermine the rather complicated set of rules under which the capitalist game is played. The disadvantages of creeping inflation are perhaps less obvious.

The most general objection to creeping inflation in modern industrialized economies is probably a social one. It may inflict unnecessary hardship on various sectors of the community. Some people are either living on fixed money incomes or are unable to adjust their money incomes sufficiently rapidly to cope with the rise in prices, with the result that they suffer a decline in their real incomes. The bulk of the increases in productivity that take place are secured by those who are in strong bargaining positions. The result of creeping inflation may not only be to reduce the real incomes of those like retired people who have little or no chance of resisting the fall, but also to lead to an undesirable allocation of resources.

The most general argument that inflation leads to a misallocation of resources from a social point of view is usually to be found in a more classical situation where prices are rising freely as a direct result of an over-expansion in the money supply. In this situation misallocation can arise due to speculation on a wide scale, which locks up resources in the form of excessive holdings of inventory rather than in investment in fixed capital, and results in investment decisions which are not based on considerations of sound growth and development. It is not, however, clear that such problems have arisen in connexion with creeping inflation. Misallocation of resources from a social point of view arises during creeping inflation primarily as a result of a relative decline in the real incomes of those who provide important services to the community but who are not under the rules of the game able to compete successfully in the income scramble. Thus the relative decline of the incomes of teachers, nurses, policemen and those who provide like services to the community may lead to a shortfall of new entrants of the required quality into these professions as the supply of labour is attracted into occupations that are regarded as more inflation-proof. The scramble for higher money incomes that has been, as we shall see, a characteristic of creeping inflation may lead to an undesirable distribution of ability among alternative employments from the point of view of the community as a whole.[1]

[1] The Radcliffe Committee in 1959 argued that, 'The rise in the cost of living has been a constant embarrassment to Governments and by 1957 the more ominous phrase "falling value of money" was frequently being used. The distributive effects of this continuous fall in the value of money have been disturbing to social institutions which most people wish to preserve; the inequities between persons

The problem of resource allocation with creeping inflation is quite generally applicable to both open and closed economies. Rising prices have, however, a special significance for open economies like the United Kingdom for they bear directly on the balance of payments and foreign trade. Under the Gold Standard, the principal monetary objective was the maintenance of foreign exchange stability, which in many cases was assumed to take precedence over price stability. This was certainly the case in a downward direction, for to preserve the external value of the currency less hesitation would have preceded a decision to deflate the economy under the Gold Standard than might be the case in many countries committed to full employment since the Second World War. For the United Kingdom the significance of the relation between the internal price level and the external exchange rate was clearly stated by the Chancellor of the Exchequer in 1957. 'This country stands determined to maintain a fixed and stable exchange rate. The primary requisite for this is that we shall be able and determined to avoid inflation at home.'[1] A faster rate of increase in the internal price level relative to the price levels of other competitors in world markets inevitably places a severe strain on the balance of payments of countries that are heavily committed to world trade. A persistently faster rate of inflation must equally place an overwhelming strain on the exchange rate, which may require alteration in order to bring domestic into line with world prices.

Such arguments as these are commonly adduced to justify general concern over the spectacle of post-war inflation.[2] Arguments of this type cannot, however, be properly considered in abstraction for economic policy at its most general level must take into account a variety of objectives which may not in the last analysis be mutually consistent. This serves to emphasize that the problem of general price level analysis must be set against the background of the working of the economy as a whole, which leads us to some consideration of the character of the kind of analytical approach we shall employ.

The Elements of Macroeconomic Analysis

The general price level is one of a variety of economic *variables* that concern us in macroeconomic analysis, which involves studying the

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and sections of the community have constituted a continuous threat to industrial peace and this threat in turn has given the rise in prices a spiral character.' *Committee on the Working of the Monetary System: Report*, H.M.S.O. 1959, para 57.

[1] Quoted in the *Radcliffe Report*, op. cit., para 54.

[2] Arguments are sometimes advanced *in favour* of a secular rise in prices. See Chapter II.

relationships that bind these aggregate variables together. Broadly speaking it is customary to group these relationships under a variety of headings such as behavioural, technological, institutional and identities. The aggregate consumption function, for example, that relates consumption to income and perhaps other variables, is regarded as a behavioural relationship whereas the relation connecting national output and the nation's stock of employed resources of labour and capital is primarily technological. These aggregate relationships must be distinguished from the relationships we customarily deal with in conventional microeconomics. It is important, for example, to distinguish the concept of aggregate demand as it arises in Keynesian economics from the simple concept of demand that we associate with the demand curve in elementary economics, and to avoid the dangers associated with the fallacy of composition that may arise as we move from the micro to the macroeconomy.

Economic analysis is often carried out at a high level of abstraction. The nearer we come to making an analysis directly applicable to the real world, however, the more important it becomes to specify a great deal more about the institutions and conventions of particular economies and the impact they have on economic behaviour. To begin with, it is quite reasonable to start at a very high level of generality, but we can never escape the problem of particular analysis if we wish to say something about practical matters of economic policy. Economic analysis can always be made so general that most people are able to agree with the conclusions that are derived from it but the price that is paid for this agreement is a lack of substantive content. The more particular we make our analysis the more important it is to recognize explicitly the institutional environment within which we are operating. The price that is paid for this development is the risk of considerably greater disagreement over the analysis for the more particular the analysis tends to become the more likely is it to be open to contradiction by observable phenomena. Institutional factors and local conventions play an important role in the analysis of wage and price formation, that occupy us for much of this book, for we must take into account, for example, the institutional character of the financial system in studying the effects of changes in the money supply in the macroeconomy, and the methods and conventions of wage fixing. In some underdeveloped countries, the wage level is determined by local convention and rules of thumb that appear to bear little relation to current variations in the supply and demand for labour, while in most developed countries we have to consider the impact of highly organized and influential trade unions on the general wage and price levels.

The development of macroeconomics founded on Keynes' *General Theory* has provided us with a number of tools for analysing the working of the economy as a whole. Not the least important aspect of this development has been the growth in our ability to treat the economy as a *general equilibrium* system. Microeconomic analysis deals with individual consumers' decisions to demand goods and services, to save and acquire assets and offer productive services and with individual producers' decisions to fix prices, hire factors of production and produce various outputs. But clearly the working of the economy as a whole is the result of the interdependent operation of many individual decisions of this kind. From a formal point of view we can make this interdependence explicit by considering the whole set of individual decisions simultaneously which would require us to handle the determination of an inordinately large number of outputs, prices, and incomes. This not only raises difficulties on account of the complexity of such an operation, but also from an empirical point of view because of the magnitude of the problem of obtaining information about the behaviour of all the individual decision units.

Modern macroeconomic analysis, however, provides us with a short cut to considering the problem of interdependence between economic phenomena, by working not with individual variables but with aggregate variables, which sharply reduces the number we have to consider at one time. Both the advantages and disadvantages of this are fairly obvious. The formulation of relationships between a more limited set of aggregate variables makes our task very much easier, but it also raises questions about the link between the aggregate variables we employ and the individual decisions that underlie the aggregate. A large proportion of conventional economic theory is formulated at the level of the individual decision unit, which has somehow to be translated into sets of hypotheses about the relation between aggregate variables, and this translation cannot always be satisfactorily achieved in a simple manner.

A further advantage of the aggregate approach to the analysis of the working of the economy has been the relative ease with which many aggregate hypotheses can be applied to aggregate data. This is partly a reflection of the relative ease with which data can be made available at the aggregate level, as opposed to the mass of data required to set against highly disaggregative hypotheses about economic behaviour, and partly a reflection of the characteristic formal simplicity of the majority of the aggregative hypotheses themselves. To what extent good economic hypotheses should have the virtue of simplicity

is debatable, but whatever is concluded on that score it is clear that useful hypotheses should be testable.

Testing economic hypotheses goes hand in hand with the problem of quantification. The great bulk of economic theory provides us with qualitative results. Theory tells us that *ceteris paribus* the demand for a commodity is negatively related to its price, whereas supply is positively related to price and so forth. Practical policies, however, require us in the last analysis to go beyond this and specify concretely the actual quantitative change in one variable conditional on the change in another. The importance of formulating economic hypotheses that can be confronted by economic data is manifest for qualitative analysis is often insufficiently powerful to permit us to reach clear cut conclusions.[1]

In the chapters that follow, however, no attempt has been made to integrate hypotheses and tests of hypotheses directly, although wherever possible attention is drawn to available evidence on particular points. The reason for this is that such a procedure would take us outside the scope of the present work and face us with a variety of technical problems that are for the moment best left on one side. The textual discussion is therefore essentially qualitative in character. The reader may also be conscious of the limited use of symbols in the discussion. The reason for this is that the bulk of the analysis of this book revolves around macro hypotheses that are themselves formally simple, so that very little is lost and perhaps something gained by declining to dress up hypotheses for the sake of it in a variety of suits of mathematical clothes. Where possible, more formal treatments of the subject matter are indicated.

The Scope of the Analysis

The aim of the succeeding chapters is not to provide what might be termed a general theory of inflation or a general theory of the price level. It is open to question as to whether it is possible to produce a theory that is sufficiently general to qualify for the title, and yet useful. As we remarked above, institutional conditions are of major importance and one need not be surprised to find that an analysis that is adequate to cope with the problems of one group of economies may not be applied directly to another.

With the exception of Chapter II we shall suppose an institutional setting similar to that which underlies Keynes' *General Theory*. We shall consider problems of inflation in the context of developed

[1] On some methodology of qualitative analysis in economics see P. A. Samuelson, *Foundations of Economic Analysis*, Harvard University Press, 1947.

economies which are relatively industrialized, with developed financial institutions and in which organized labour plays a significant role. In a broad sense the background is one of private enterprise and we do not deal directly with problems that face the Socialist economies or those economies in the process of development which are subject to a high degree of central planning and direct control.

The Plan of the Book

In Chapter II we analyse the determination of the general price level in an exchange economy under a variety of simplifying assumptions. This serves to introduce some basic ideas and concepts which are carried over into a restatement of conventional employment theory with the emphasis on the determination and role of the general price level (Chapters III and IV). In Chapters V to IX we take up in more detail the problem of price and wage determination and the demand for money, and the analysis of these chapters is brought together in the framework of a simple model of the macroeconomy in Chapter X. Chapter XI is devoted to some consideration of the implications of the preceding chapters for economic policy.

CHAPTER II

Prices and the Laws of Exchange

Introduction

The main purpose of the present chapter is to introduce a number of ideas that will prove useful at various points throughout this book by considering the determination and behaviour of the general price level in a highly restricted model of economic exchange. The model is highly artificial, but an examination of the rather abstract world that it represents will enable us to assimilate more rapidly at a later stage theories of the general price level that bring us closer to reality. In effect we shall extend the simple idea of the law of supply and demand to a world of many commodities and money. We shall find that a number of problems that arise in this simplified world recur in more complicated pictures of how the economy works.

The Exchange Economy

Our hypothetical economy is closer to the idea of a general market for goods and services rather than an economy in the familiar sense. The process of exchange is the focal point of interest, so it is assumed that the productive resources of the economy are given and allocated in a fixed manner to the production of different commodities and services. The quantity produced of each good or service is therefore fixed and unresponsive to any changes in price.

The basic decision units of the exchange economy are individuals whose decisions are limited to the choice of purchases of the goods that come on to the market in each period of time (which for the moment will be left undefined) and to the increase or decrease in their stock of assets that is desired. We assume that only one type of asset is available, namely, money, so that by implication all goods and services are perishable. There are no durable goods that might be held in the form of stocks.

The decision units are sufficiently numerous to allow us to treat the

economy as competitive, in the sense that the contribution made by any individual to the supply of a good on offer for exchange or to the demand for any particular good is so small as to have no effect on its price. Decision units are thus price takers. They treat ruling market prices as given in deciding the amounts of each good or service they wish to consume and the quantity of money that they desire to hold.

In reaching these decisions, an individual in the exchange economy is faced with the limitation at any moment of time of a given quantity of monetary resources. The basic activity of the economy by definition is the carrying out of trade in the fixed amounts of goods and services that are available. It is convenient to consider this activity as taking place in an extended market in which all decision units have knowledge of the price of goods available. They bring to this at the beginning of a period of market activity, a known receipt in money terms that recurs in each period, which we can define as income, and their initial stocks of cash. At the conclusion of the market period an individual leaves with a particular collection of goods and a terminal stock of cash. The goods he is able to purchase and his terminal stock of cash are manifestly limited to being equal in value to the sum of the money income and the initial stock of cash that was brought to market. This sum constitutes the individual's budget restraint.

Utility and the Demand for Money

The guiding principle of the exchange economy is the principle of utility maximization. The simplest illustration of this principle at work is the two-good economy with no assets where individuals allocate their income between two commodities until the marginal rate of substitution between them is equal to their relative prices. This procedure can be analysed with the indifference curve diagram of elementary price theory,[1] for a single individual.

The analysis of the exchange economy as we have depicted it differs from the single simple consumer indifference analysis in two main respects. Firstly, we have allowed individuals to save part of their income by adding to their holdings of money, and secondly, we are now concerned with a whole set of individuals trying to maximize their utility at once. This second feature means that we have taken a step from the field of *partial equilibrium* analysis that considers the optimal purchases of a single individual to the field of *general equilibrium* analysis.

This second step raises some problems on a formal level, but the substantive logic of the simple partial case is not altered. The

[1] See, for example, W. J. L. Ryan, *Price Theory*, Macmillan, 1958, Chapter 1.

introduction of money, however, requires some further consideration. It is apparent that the physical quantities of goods consumed help to determine an individual's level of utility or well-being, but it is perhaps less obvious why an individual's well-being should require that he holds a certain quantity of cash. This brings us to the question of the demand for money.

In our simple exchange economy, money is the only asset held by decision units. Elementary textbooks usually begin by listing the functions of money as (a) a medium of exchange, (b) a store of value, (c) a unit of account. In the exchange economy, money fulfils all three roles. Prices are quoted in terms of the monetary unit and goods are exchanged through the medium of cash. The exchange economy is not a barter economy, so that an individual trading in the market period must hold a sufficient quantity of cash to carry out the transactions he desires to make.

The second function of money is in some ways the most interesting and it will recur at certain strategic points in Part II. Misers apart, the value of a given quantity of money in nominal terms is determined by the quantity of goods it can purchase. It is not demanded for its own sake. At any moment of time the possession of a nominal quantity of money constitutes a certain command over goods and services, and the extent of this command will depend on the general price level. As we saw in the last chapter, the general price level cannot be uniquely defined, but we shall think of it here as constituting some index in which the prices of all individual goods and services appear.

From the point of view of an individual, therefore, a given holding of nominal money and a given general price level defines a basket of 'stored up' goods which he can decrease at any moment by reducing his cash balances and spending in excess of his income or which he can increase by spending less than his money income and adding to his stock of nominal money. In the first case he will consume his capital and in the second he will save. The demand for money as a store of value in the exchange economy is, therefore, related to the demand for 'stored up' goods or capital, additions to which are governed by the individual's decision to save.

We assume for the moment that the expectations of decision units within the exchange economy are static in the sense that the current levels of prices for goods and services are expected to persist for ever. Individuals, however, are not taken to be entirely free from risk. Risk enters into their decisions in two ways. In the first place, while we assume that expectations with regard to money income are also static, such expectations are not held with complete certainty. Hence

a stock of 'stored up' goods constitutes a hedge against the possibility of an unexpected decline in money income in the future. Secondly, individuals may be faced with unexpected needs, for example, through illness, and they will wish to be able to meet unexpected calls on their resources. Hence prudence will demand that a balance be struck between the dictates of current consumption and the unexpected desirability of overspending one's income.

Students of the savings decision have drawn attention to a further motive for saving and holding 'stored up' goods, namely, the possible divergence between an individual's stream of income over time and his desired temporal pattern of consumption.[1] Following this approach, saving is principally a means of evening out or spreading the consumption flow over an individual's lifetime. To adopt this theory here would involve us in some complications, because the theory is based on the principle of inter-temporal utility maximization. That is to say that rational behaviour in the market period would require us to take into account quantities and values which appear at future dates. Whatever the merits of this approach the loss of simplicity of our present analysis would be substantial if it were adopted. We can, however, incorporate it in part by allowing individuals to recognize the possibility of, for example, retirement at a future date and to consider their demands for a stock of 'saved up' goods to depend to some extent on this possibility.

Motives for holding money as a store of value in the exchange economy can in a broad sense therefore be brought together under the umbrella of the virtue of prudence and described as being inherently *precautionary*. It is important to note that the precautionary demand for money is not a demand for nominal money but is based on the demand for a stock of 'stored up' goods. i.e. on the demand for real money. Individuals are interested in the value of their cash holdings in terms of consumption goods or their real balances. Hence the well-being or utility of individuals depends not on the quantities of goods they consume and their nominal holdings of cash, but on the quantities of goods they consume and their nominal balances of money divided by some measure of the general price level. These constitute their *real cash balances*.

Equilibrium Prices, Quantities and Stocks

To recapitulate, the utility of decision units in the exchange economy

[1] Cf. M. Friedman, *Theory of the Consumption Function*, Princeton University Press, 1957. F. Modigliani and R. Brumberg, 'Utility Analysis and the Consumption Function: An Interpretation of Cross Section Data', in *Post-Keynesian Economics*, edited by K. Kurihara, Allen and Unwin, 1955.

depends on the quantities of each type of good or service they consume in the current period and their current stock of real balances. In the market period each decision unit acts in such a way as to maximize his utility subject to his budget constraint, or disposable resources. By definition, the time horizon of decision units in the exchange economy is strictly limited to the current market period. This raises some difficulties with regard to the problem of time and forces us to consider more closely the concept of the market period. A second problem that requires comment is the determination of the total supply of nominal money in the exchange economy. Since this is a fairly simple matter, we dispose of it first.

For the most part, in this section, we shall regard the nominal supply of money as fixed along with the production of the relevant goods and services. But since it will prove useful later it is convenient to specify how the nominal money stock is determined. We assume the existence of Government and postulate that nominal money is a form of Government debt. A pound note is a debt by the Bank of England for it is a promise to pay one pound to the bearer. Under the full gold standard a pound note was redeemable in gold, but under the existing monetary rules of the United Kingdom it is exchangeable solely for another pound note. We shall assume that Government debt in the exchange economy is similar. The Government can increase the supply of nominal money by itself entering into the market and purchasing goods which it pays for by issuing its own debt. Since goods and services are not durable it cannot hold stock of goods, and so cannot reduce the money supply by selling goods on the market and reducing its outstanding debt. But as our attention will be focused at a later stage on increase in the nominal money supply this does not constitute a limitation. Goods acquired by the Government are assumed to be transferred abroad so that no internal transfers take place to complicate matters.[1]

Our problems with regard to time in the exchange economy arise in the following manner. We envisage the interval between the opening and closing of the market in our economy as defining the *market period.* When the market period begins, individuals bring to the market their command over resources as governed by their budget restraints. Goods are bought and sold, each individual attempting to purchase his 'optimal' collection of goods and to effect his desired increase or decrease in his real cash balances. The burden of adjust-

[1] A more elaborate model is to be found in J. G. Gurley and E. S. Shaw, *Money in a Theory of Finance*, Brooking Institute, 1959, Chapter II. The consequences of allowing internal transfers are discussed.

ment in the market is borne by changes in the relative prices of goods and services in exchange until equilibrium is reached. An equilibrium set of prices in the market period will consist in that set of prices which effects a balance between the demand and available supply of each good or service and allows all individuals to simultaneously achieve their desired increase or decrease in their real cash balances. The equilibrium conditions for each individual must be fulfilled such that the marginal rate of substitution between any two goods depends on their relative prices. When equilibrium in this sense is achieved the market closes.[1]

After the market closes production takes place again and the market subsequently reopens. We shall establish a local ground rule that when the market reopens, the prices for goods and services quoted at the beginning of the market period will be equal to those that ruled at the closure of the previous period. Will this set of prices be an equilibrium set for the new market period? The answer is that, in general, they will not be. The reason for this is to be found by examining the budget restraint for a given decision unit. It is the sum of money income and the initial stock of cash. If an individual has made a net addition to or deduction from his stock of nominal money balances in the last market period his budget restraint in the current period will not be identical with that of the past and his activity in the market will alter accordingly. It follows that, in general, the set of prices will have to alter to take this into account.[2] An equilibrium set of prices that satisfies successive market periods requires, therefore, that two conditions be fulfilled. The first is that prices must be such as to effect a balance between demand and the available supply on all markets for goods and services. This is sometimes called the condition of *flow* equilibrium. The second is that prices must be such as to equate the initial holdings of real balances to the demand for real balances for each individual. The economy's real stock of cash will then be equal to its desired stock and net saving by any individual will be zero. This

[1] We shall assume throughout that a set of equilibrium prices always exists. The existence of such a set within the framework of a complete model of perfect competition raises theoretical issues that are beyond the scope of our present method. For some discussion of this problem see R. Dorfman, P. A. Samuelson, and R. M. Solow, *Linear Programming and Economic Analysis*, McGraw-Hill, 1958.

[2] This phenomenon arises from the explicit inclusion of the stock of real cash balances as a determinant of individual utility. An exchange economy which excludes assets as direct determinants of individual utility is discussed in Professor Hicks' classic work, *Value and Capital*, Oxford University Press, 1939.

is referred to as the condition of *stock* equilibrium.[1] A set of prices that satisfies both these conditions may be said to characterize a position of long period or full stock equilibrium. A set of prices that produces a balance between the demand and supply of goods and allows desired increases or decreases in real balances to be achieved will characterize the short period or market period equilibrium.[2]

Given a fixed supply of nominal money, this distinction between short and long period has an interpretation in terms of the distinction between the relative and absolute price levels. In the market period relative prices govern the allocation of consumers' demand and at the close of a given market period a particular general price level rules. Any alteration of the market equilibrium set of prices in the following period can be thought of as due to the general price level not being equal to that price level which given the stock of nominal money will provide the total stock of real balances that the economy desires to hold.

It is implicit in the above discussion that we must be careful in speaking about the concepts of equilibrium and adjustment to specify the time period to which we refer. For we can conceptually distinguish the short period adjustment process that establishes flow equilibrium in the market period and the longer period process of adjustment that makes the economy's stock of real balances equal to its desired stock. Considerable confusion has arisen due to a failure to recognize this distinction.

Excess Demand and the Dynamics of Price Adjustment

We have seen that full stock equilibrium implies a unique set of relative prices of goods and services and a unique value of the general price level. Full stock equilibrium determines this set of relative prices and the particular general price level. But what these will be depends on what we may call the *data* of the analysis. For example, we have assumed (implicitly) a set of constant tastes for the individuals of the

[1] Hereabouts and until explicitly stated otherwise we shall assume that the nominal stock of cash is held constant by the Government.

[2] This distinction has bothered a number of writers who have drawn conclusions from it that have been applied to problems that do not immediately interest us here. See for example G. C. Archibald and R. G. Lipsey, 'Monetary Theory and Value Theory: A Critique of Lange and Patinkin', *Review of Economic Studies*, October 1958. C. Lloyd, 'The Equivalence of the Liquidity Preference and Loanable Funds Theories and the *New* Stock-Flow Analysis', *Review of Economic Studies*, June 1960. W. J. Baumol, 'Stocks, Flows and Monetary Theory', *Quarterly Journal of Economics*, February 1962. A mathematical presentation of the distinction is to be found in R. J. Ball and R. G. Bodkin, 'The Real Balance Effect and Orthodox Demand Theory: A Critique of Archibald and Lipsey', *Review of Economic Studies*, October 1960.

exchange economy, a given volume of productive resources in fixed uses, and a given nominal stock of money. In many forms of economic analysis it is interesting to consider the problem of what would happen to the elements we are trying to determine (prices, incomes, interest rates, etc.) if we change the data of our problem, and by comparing two equilibrium positions between which the data has altered we can to some extent isolate the effects of a change in a particular piece of data and assess its importance. The datum that usually receives most attention in the present kind of analysis is the nominal stock of money.

It is important to remember that the relative amounts of goods and services consumed in equilibrium depend on the *relative* prices of these goods and services not on their absolute level.[1] Furthermore, full stock equilibrium requires that the relative quantities of goods and services demanded should equal the relative amounts supplied, and that the actual stock of real balances should be equal to the stock desired. But since the stock of real balances is by definition the stock of nominal money divided by the general price level, a given stock of real balances can be represented by an infinity of pairs of values of the nominal money stock and the general price level, and the real equilibrium values of goods and services consumed and real balances held are independent of what combination happens to prevail at a given moment of time provided that they satisfy the condition of providing a ratio equal to the desired stock of real balances. This suggests that an alteration in the nominal money supply in the exchange economy, simply results ultimately in a change in the general price level of the same percentage amount, which is consistent with the crude Quantity Theory of Money.[2] To establish this conclusion it is necessary for us to consider the question of how the general price level in fact adapts itself to the nominal stock of money, and to answer it we must investigate some aspects of the change in the general price level which is the subject of price dynamics.

[1] Those in doubt may reconsider the simple one-consumer, two-good case of elementary price theory.

[2] The crude Quantity Theory states that if the stock of nominal money rises by x%, the general price level will also rise by x%. This result may be obtained by *assuming* that the demand for money has unitary elasticity. In the present analysis, however, the introduction of real balances as a determinant of individual utility implies that unitary elasticity in the demand for money is a conclusion, not a presupposition. This distinction is important for the dynamic analysis of the exchange economy. The neo-classical economists were inclined to treat unitary elasticity as a presupposition. A full discussion of this problem is to be found in Don Patinkin, *Money Interest and Prices*, Evanston, Row Peterson, 1956, especially Chapter VIII.