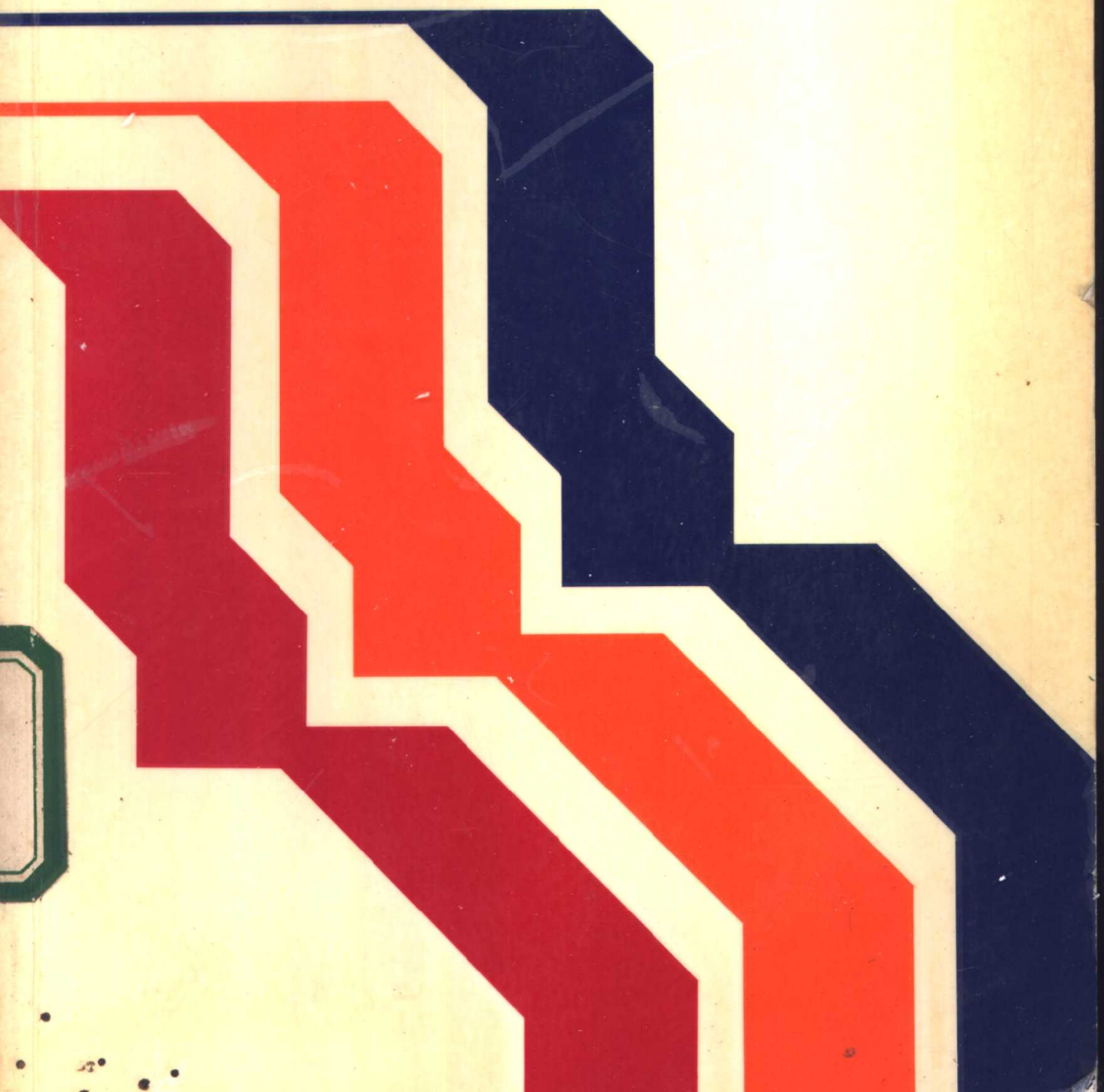


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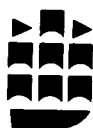
an intermediate text

David Cobham



Macroeconomic Analysis: An Intermediate Text

David Cobham



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Preface

This book was written mainly for second-year university and polytechnic students, though others may also find it useful. It assumes some familiarity with elementary Keynesian macroeconomics, and it assumes that students have mastered all they need to know at this level about the national income accounts and the construction of price indices.

It is intended to give students a grounding in the techniques of macroeconomic analysis (although it does not use calculus or sophisticated mathematics). It therefore pays particular attention to the three key macro models – the Keynesian cross, the IS–LM and aggregate demand/aggregate supply models. At the same time it aims to cover all the main subject areas of modern macroeconomics, from consumption and investment to inflation and open economy issues. It is therefore selective *within* rather than *between* subjects, and avoids lengthy discussions of the empirical evidence and case-study material. However, a small number of additional readings covering both analytical and empirical material are suggested at the end of each chapter.

Above all, the book is designed to give a coherent and structured outline of macroeconomics in a simple but clear historical perspective which goes from classical via Keynesian and monetarist to New Classical macroeconomics. This inevitably involves some simplification, but at this level of economics some sacrifice of complexity to clarity is well justified, and the key qualifications to the arguments developed in the text are mentioned in the concluding sections of the chapters.

I am grateful to students and colleagues at St Andrews University on whom this text was first tried out; to Bill Lynch and Alex Pratt who read preliminary drafts of some chapters at an early and crucial stage; to Chris Adam who gave me a number of useful comments on the book; and, most of all, to Mike Sumner and George Zis who commented in detail on the first draft. Nevertheless, full responsibility for this final version rests with me.

For Mollie and Anthony,
Jean and Pat

Contents

Preface viii

1. Introduction 1

Classical macroeconomics 1
Keynes 2
The Keynesian cross model: revision 2
Keynesians versus neoclassicals 6
The IS–LM model: introduction 7
The Keynesian–neoclassical synthesis 8
Keynesians versus monetarists 8
Subsequent developments 9
The aggregate demand/aggregate supply model:
introduction 10
Conclusions 12
The plan of the book 13
Further reading 13

2. Consumption 14

The absolute income hypothesis (AIH) 14
The stylised facts 16
The permanent income hypothesis (PIH) 17
The measurement of permanent income 20
The short-run multipliers 22
Other variables which might affect consumption 24
Conclusions and qualifications 25
Further reading 26

3. Investment 27

Discounting and the marginal efficiency of capital 27
The marginal efficiency of investment 30
Expectations and the accelerator 31
The capital stock adjustment principle 33
Profits and retained earnings 34
The neoclassical approach to investment 34
Summary 36
Empirical evidence 37
Significance: stability and the transmission mechanism 38
Further reading 38

4. The government and foreign trade sector 39

- The government sector 39
- The balanced budget multiplier 40
- The foreign trade sector 42
- The basic multiplier in the full Keynesian cross model 43
- Conclusions and qualifications 44
- Exercises 45

5. The demand for money 46

- The classical quantity theory 46
- The Keynesian theory of the demand for money 48
- The modern quantity theory of the demand for money 52
- Summary 54
- Empirical evidence 55
- Conclusions and qualifications 56
- Further reading 57

6. The supply of money 58

- The high-powered money multiplier approach 58
- The credit counterparts approach 60
- Application to the UK 61
- Further reading 62

7. The IS–LM model 63

- The goods market: IS 63
- The money market: LM 72
- Overall equilibrium 77
- Crowding out and the transmission mechanism 81
- Qualifications 83
- Exercises 84

8. The labour market, Keynes and unemployment 85

- The classical labour market 85
- The Keynesian–neoclassical debate 87
- The Keynesian labour market 91
- The rationale for a horizontal AS curve 94
- Conclusions and qualifications 96
- Exercises 97
- Further reading 97

9. Inflation – Phillips curves 98

- The original Phillips curve 98
- Expectations-augmented Phillips curves 102
- Adaptive and rational expectations 106
- Conclusions and qualifications 109
- Further reading 111

10. Inflation – cost-push and a wider perspective 112

The cost-push theory of inflation 112

Cost-push and real demand 114

A wider perspective 115

Conclusions 117

Further reading 118

11. The open economy under fixed exchange rates 119

The foreign exchange market 119

Foreign trade multiplier analysis 121

The role of money 122

The monetary approach to the balance of payments 124

The MAB in a very small, very open economy 125

The MAB in a medium-sized open economy 127

Macroeconomic implications 127

Conclusions and qualifications 128

Further reading 129

12. The open economy under flexible exchange rates 130

The elasticities approach to devaluation 130

The absorption approach to devaluation 131

The wage response to devaluation 132

The MAB approach to devaluation 134

The determination of flexible exchange rates 135

Macroeconomic implications 137

Conclusions and qualifications 138

Further reading 139

13. The current state of macroeconomics 140

Macroeconomics since the early 1970s 140

Traditional Keynesianism 142

The convergence school 144

New Classical macroeconomics 147

Comments and qualifications 151

Exercises 153

Further reading 153

Bibliography 154

Index 156

1 Introduction

The aim of this chapter is to introduce some of the key debates in macroeconomics and to revise or introduce the three most important models of the determination of national income. It gives a simple and schematic account of the history of macroeconomics, concentrating on the answers given by the various schools of thought to two questions: (1) is a market economy self-equilibrating, in particular can a sustained situation of unemployment exist? and (2) if the economy is not self-equilibrating can the government do anything to improve it, in particular can the government reduce and/or prevent sustained states of unemployment? The three models of national income determination are introduced at appropriate points in this historical account.

Classical macroeconomics

The starting point of any history of macroeconomics must be 'classical' macroeconomics, but the term 'classical' is not unambiguous. In other areas of economics, especially that of value and distribution, 'classical' refers to writers such as Adam Smith, David Ricardo and Karl Marx who used largely non-marginalist methods of analysis (the so-called 'surplus approach'), as opposed to the 'neoclassical' writers who used the marginalist methods and propounded marginalist theories of value and distribution, from Stanley Jevons, Karl Menger and Leon Walras onwards. In macroeconomics however conventional practice has been strongly influenced by Keynes's definition of the word 'classical' in the first chapter of his *General Theory* (1936) to include more or less all macroeconomics before him. This was a considerable oversimplification (though the marginalist revolution had less obvious importance for macro- than for microeconomics); however, the usage is now so widespread that it will be employed here without further question.

The answer given by classical macroeconomics in this sense to the first of the two questions posed above was unequivocal: a market economy is self-equilibrating, it adjusts so that the supply of and demand for labour are equated, and sustained states of *involuntary* unemployment – where people wish to work at the existing wage rate but cannot find a job – cannot occur. In essence, macroeconomic relationships were regarded by classical economics as simple aggregations from microeconomic relationships, and wages and prices were assumed to be flexible at the aggregate macro as well as the disaggregated micro level. This can be seen most clearly in the work of Walras, which can best be thought of as a substantial contribution to the development of general equilibrium theory. It can also be seen in Say's law (after the economist J-B. Say), the idea that the aggregate demand for goods

and services must always be equal to the aggregate supply of goods and services, on the grounds that economic agents (firms and households) will supply goods and services only if, and because, they demand other goods and services.

Classical macroeconomics was thus hardly a separate branch of the subject. In particular, as Keynes remarked, it had no theory of the demand for (or supply of) output as a whole. It had a theory of the determination of the price level, the Quantity Theory of Money (see Ch. 5 below), and a theory of the determination of real wages in the labour market (Ch. 8). But it had very little to say about aggregate demand, it perceived no problem of unemployment and it envisaged no role for any form of macro policy other than control of the money supply to prevent inflation. The essential reason for all this was that classical economics concentrated, at least in its more formal and rigorous analysis, on the long-term development of the economy, and it produced no clearcut agreed explanation of short-run fluctuations in economic activity.

Keynes

John Maynard Keynes was an economist in Cambridge (England) whose *The General Theory of Employment, Interest and Money* is commonly thought to have produced a revolution in macroeconomics. At the very least Keynes's work can be regarded as the *sine qua non* of modern macroeconomics, and his writings and ideas still provide a background to the thinking even of those economists who oppose them most strongly.

The answers Keynes gave to the two questions posed above are clear: (1) the economy is *not* self-equilibrating, and sustained states of involuntary unemployment may occur; and (2) the government *can* do something to reduce and/or prevent unemployment, by making appropriate use of monetary and fiscal policy. Keynes therefore provided a justification for a policy of macroeconomic intervention, in contrast to the *laissez-faire* of the classical economists who preceded him.

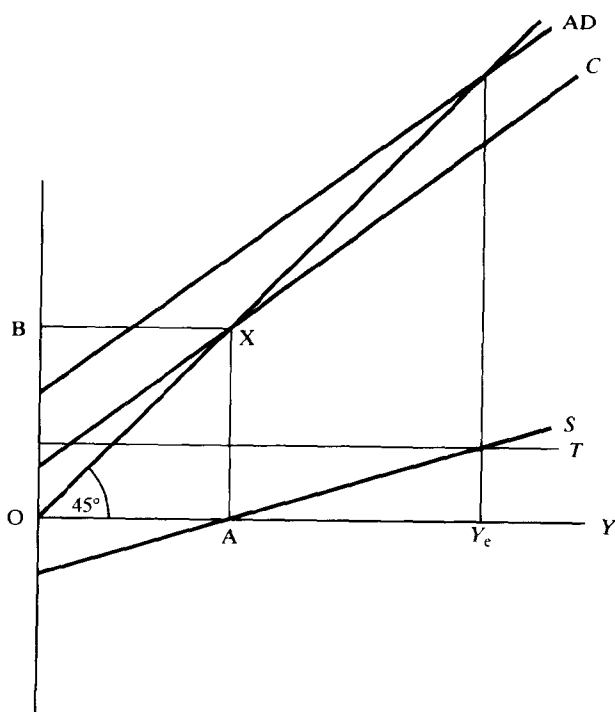
Exactly how Keynes arrived at these answers is, however, less clear, for his writings are open to a number of interpretations. Exactly what is the 'correct' interpretation of Keynes is not a subject discussed in this book, although occasional reference is made to it; the term 'Keynesian' is used here primarily to refer to the work of economists who *saw themselves* as following in Keynes's footsteps, whether they 'really were' or not. One thing that is clear, however, is that in contrast to classical economics Keynes was very concerned to develop a theory of the demand for output as a whole and hence a model of the (short-run) determination of national income. The simplest model of this kind is that referred to as the Keynesian cross model, though Keynes himself never expressed his ideas in quite this way.

The Keynesian cross model: revision

It is commonplace in economic models for equilibrium to occur where supply

equals demand; for a model of the determination of national income this means that equilibrium occurs where aggregate supply, that is the output of all goods and services, is equal to the aggregate demand for goods and services. The key characteristic of the Keynesian cross model is that aggregate supply responds passively to aggregate demand and national income is therefore determined by the latter. On the other hand, aggregate demand, which in the simplest case is the sum of consumption and investment, is partly autonomous and partly positively related to income, with a marginal propensity to spend (on all forms of demand) less than unity. This means that aggregate demand depends on income as follows: at low levels of income aggregate demand is greater than income, and at high levels of income it is less. On the other hand, aggregate supply or output is simply equal to national income, as a result of the way both aggregates are defined and measured in terms of the *value added* in production which corresponds to the factor incomes (wages, profit, interest and rent) generated. Equilibrium, that is the position from which there is no endogenous tendency for the economy to move, occurs at the (unique) level of income where (*ex ante* or planned) aggregate demand is equal to income and therefore output. Moreover, it can be argued that this is a *stable* equilibrium, for if demand is greater than output firms will find their sales exceed their output and will therefore expand it; while if demand is less than output firms will find their output exceeds their sales and will contract it.

Figure 1.1



In diagrammatic terms an aggregate demand curve AD can be constructed as in Fig. 1.1 which has demand on the vertical axis and income (or output) on the horizontal axis. AD is the vertical sum of consumption C , which varies positively with income Y and may (as in Fig. 1.1) or may not have a positive intercept on the vertical axis (i.e. an autonomous component), *plus* investment I which is assumed to be autonomous: AD is constructed by adding together the amounts of C and I at each level of income. Figure 1.1 also shows a 45° line through the origin: it is a geometric property of such a line that at any point along it, the level of income (e.g. at point X the distance $OA = BX$) is equal to the level of demand (the distance $OB = AX$); thus the 45° line is a representation in the diagram of the condition for equilibrium that aggregate demand, measured on the vertical axis, must be equal to aggregate supply or output (which equals income), measured on the horizontal axis. It is also a property of the 45° line that its slope is equal to one (unity), for the slope of a straight line is given by the ratio of the length of the vertical side to that of the horizontal side of any right-angled triangle drawn underneath the line with the line as the third side, such as OAX ; the slopes of the C or AD curves, on the other hand, are less than one. Equilibrium occurs in this model where aggregate demand is equal to income and output, that is where the AD curve and the 45° line intersect or *cross* (hence the name of the model), which is at income Y_e in Fig. 1.1. Changes in aggregate demand, that is shifts of the AD curves caused by shifts of the C or I curves, cause changes in income, with equilibrium income occurring where the new AD curve intersects the 45° line.

The same analysis can be carried out in algebraic terms as follows. The elements of aggregate demand are given by

$$C = a + bY \quad [1.1]$$

$$I = \bar{I} \quad [1.2]$$

where a and b are constants representing the autonomous component of consumption and the marginal propensity to consume respectively, and the bar over the I indicates that investment is autonomous. The equilibrium condition is

$$Y = C + I \quad [1.3]$$

that is, output or income Y is equal to total aggregate demand $C + I$. Substituting from [1.1] and [1.2] into [1.3] gives

$$Y = a + bY + \bar{I} \quad [1.4]$$

In order to express Y in terms of autonomous elements and parameters only (i.e. in terms which do not include any Y element), equation [1.4] needs to be manipulated as follows:

$$Y - bY = a + \bar{I}$$

$$Y(1 - b) = a + \bar{I}$$

$$Y = \frac{a + \bar{I}}{1 - b} = \frac{1}{1 - b} \cdot (a + \bar{I}) \quad [1.5]$$

Here $(a + \bar{I})$ is total autonomous expenditure and $1/(1 - b)$ is the multiplier,

that is the amount by which total autonomous expenditure must be multiplied to obtain the equilibrium level of income. Similarly, the *change* in income which results from a *change* in total autonomous expenditure is equal to the latter multiplied by $1/(1 - b)$:

$$\Delta Y = \frac{1}{1 - b} \cdot \Delta(a + \bar{I}), \text{ or}$$

$$\frac{\Delta Y}{\Delta(a + \bar{I})} = \frac{1}{1 - b} \quad [1.6]$$

where Δ means 'the change in'. It is useful to call this multiplier the 'basic multiplier' to distinguish it from the multipliers for (changes in) particular components of autonomous expenditure which may or may not be the same (for example, the multipliers for government expenditure or taxes – a negative component – which are considered in Chapter 4).

The above analysis can also be carried out in terms of an alternative form of the equilibrium condition: aggregate demand is equal to consumption *plus* saving, but income is equal by definition to consumption *plus* saving, therefore the equality of aggregate demand and output or income can be expressed as the equality of saving and investment, where saving can be thought of as the (only) withdrawal from the circular flow of income, and investment as the (only) injection into the flow. Diagrammatically this can be shown as in Fig. 1.1 by the intersection of saving and investment at Y_e , where the saving curve S is constructed by subtracting C vertically from Y (i.e. from the 45° line along which the vertical distance from the horizontal axis is equal to Y). The S curve must have an intercept on the vertical axis equal in magnitude but of the opposite sign to that of the C curve, and it must cut the horizontal axis at the level of income where consumption equals income and the C curve cuts the 45° line; if the diagram is drawn correctly the S curve will intersect the I curve at the same level of income as that at which the AD curve intersects the 45° line. In terms of the algebra,

$$S = Y - C = Y - a - bY = -a + (1 - b)Y$$

$$I = \bar{I}$$

Equilibrium occurs where $S = I$:

$$-a + (1 - b)Y = \bar{I}$$

$$(1 - b)Y = a + \bar{I}$$

$$Y = \frac{a + \bar{I}}{1 - b}$$

as before.

Finally the above analysis can be extended to incorporate government expenditure on goods and services G together with tax revenue T , where consumption is now related to disposable income $Y_d = Y - T$; and to incorporate exports X and imports F . Aggregate demand is now equal to $C + I + G + X - F$, which must be equal to output or income Y for

equilibrium. Since Y is now equal to $Y_d + T = C + S + T$, the alternative form of the equilibrium condition is obtained as follows:

$$Y = C + S + T = C + I + G + X - F$$

$$S + T = I + G + X - F$$

$$S + T + F = I + G + X \quad [1.7]$$

where the left-hand side of [1.7] is withdrawals from the circular flow of income and the right-hand side is injections into it. This more comprehensive version of the Keynesian cross model is discussed in Chapter 4 below.

The Keynesian cross model is a very simplified model and it suffers from at least three obvious defects: (a) it includes no money and no interest rate, or more technically no 'monetary sector'; (b) it implicitly assumes an exogenously fixed price level, which does not vary when output and income vary; and (c) it incorporates no analysis of the labour market and implicitly assumes an exogenously fixed wage level. However, it produces two key results related to the two questions posed at the beginning of the chapter and Keynes's answers to them. Firstly, income can in principle be at any level, depending on aggregate demand, and there is nothing that makes it tend towards the full employment level of income (which was not even specified in the above exposition). Secondly, in principle the government can do something to bring this level of income closer to the full employment level, by varying its own expenditure G (which directly affects aggregate demand) or by varying tax revenue T (which affects aggregate demand indirectly via its influence on disposable income and hence consumption). Thus the Keynesian cross model is consistent with the rationale Keynes provided for an active macroeconomic policy.

Keynesians versus neoclassicals

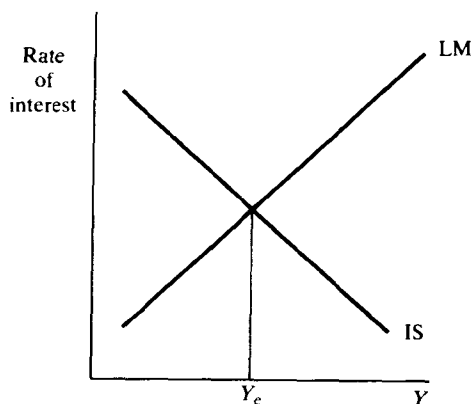
Keynes's *General Theory* led to a lively debate in the 1940s and 1950s between those economists who saw themselves as his followers and other economists who felt closer to the instincts and policy recommendations of pre-Keynesian classical economics but were prepared to use Keynes's analytical framework with its emphasis on aggregate demand in arguing against him and his followers. These economists are commonly referred to in macroeconomics as *neoclassical economists* or *neoclassicals*. The answers they gave to the two questions posed at the beginning of this chapter were as follows: (1) yes, a market economy is self-equilibrating and it will automatically tend to full employment, provided wages and prices are flexible; and (2) in theory there is therefore no need for the government to intervene in the economy, but in practice the automatic mechanisms may take so long to work that some limited intervention may be justified. Much of the argument between the Keynesians and the neoclassicals was conducted in terms of the second of the three models of national income determination, the IS-LM model.

The IS–LM model: introduction

This model involves adding a monetary sector to the Keynesian cross model; it therefore corrects for the first of the three defects of that model listed above (in fact historically the IS–LM model preceded the Keynesian cross model and the latter originated as a simplification of the former).

The condition for equilibrium in the money market is that the supply of money equals the demand for it; the supply is generally assumed to be fixed exogenously by the government or central bank and the demand to depend positively on income and negatively on the interest rate. The money market therefore interacts with the market for goods and services where aggregate demand depends on income as before and now on the interest rate too, since investment is assumed to depend partly on the latter. The effect is that both income and the interest rate are determined simultaneously by the interaction of the money and goods and services markets. Figure 1.2 gives the most common, diagrammatic, representation of the model. With the interest rate on the vertical axis and income on the horizontal axis the IS curve shows all the combinations of income and interest rate at which the goods and services market is in equilibrium, while the LM curve shows all the combinations at which the money market is in equilibrium: the only combination where both markets are in equilibrium, that is the unique point of overall equilibrium, occurs where the two curves intersect.

Figure 1.2



The construction and use of this model are described in detail in Chapter 7 below. For present purposes what should be noted is that the IS–LM model is a more comprehensive model than the Keynesian cross model of the *determination of aggregate demand*: it includes a monetary sector, and this allows a wider range of relationships and effects to be discussed. For example, the government can influence income in this model by manipulating the supply of money, as well as by varying government expenditure or taxes. However, prices and wages remain exogenous to the IS–LM model and it includes no labour market.

The Keynesian–neoclassical synthesis

Keynes had emphasised aggregate demand in a way that classical economics had not; the neoclassicals were prepared to argue within Keynes's framework but the way in which they used it was different. Essentially they argued that provided wages and prices were flexible then if there was (temporarily) less than full employment wages and prices would fall, and this would lead to increases in real aggregate demand which would restore full employment. In terms of the IS–LM model a fall in prices shifts the LM curve and, more controversially, the IS curve to the right, so increasing aggregate demand and the equilibrium level of income (as in the Keynesian cross model aggregate supply responds passively to aggregate demand). What this means is that if wages and prices are flexible there cannot be a shortage or deficiency of aggregate demand, so that there cannot be an equilibrium with less than full employment. This conclusion was strongly resisted by the Keynesians (the debate is surveyed in Ch. 8 below), but in the end they were forced to concede it. However, the neoclassicals were also obliged to concede that in practice wages and prices did not seem to be very flexible, so that there was a justification for the kind of macroeconomic policy supported by the Keynesians.

A 'truce' of this sort between Keynesians and neoclassicals, often referred to as the 'Keynesian–neoclassical synthesis', was reached in the mid-1950s. It involved in effect an agreement that different conclusions were appropriate in theory and in practice; alternatively it could be understood as giving different conclusions for different time periods, on the grounds that wages and prices were inflexible in the short run but flexible in the long run.

Keynesians versus monetarists

This synthesis allowed Keynesian economists to continue their work on short-run macro policy much as before, but in the 1960s they came under attack from a different group of economists who later became known as monetarists. There was some overlap between monetarists and neoclassicals, but the overlap was always limited and there are notable examples of economists who were neoclassical in one debate but Keynesian in the other, or Keynesian in one debate but monetarist in the other, so that it is better to keep the categories distinct.

The first main strand of the Keynesian–monetarist controversy centred on the determinants of aggregate demand; it related in other words more to the second than to the first of the two questions posed above. The monetarists were concerned primarily to argue that monetary factors (mainly the growth of the money supply, which they treated as under the exogenous control of the monetary authorities) rather than autonomous expenditures (such as investment or government expenditure) were the dominant influence on aggregate demand. By this time the Keynesians on the other hand were arguing much more strongly than Keynes himself had argued that monetary factors were of very little importance but autonomous expenditures were