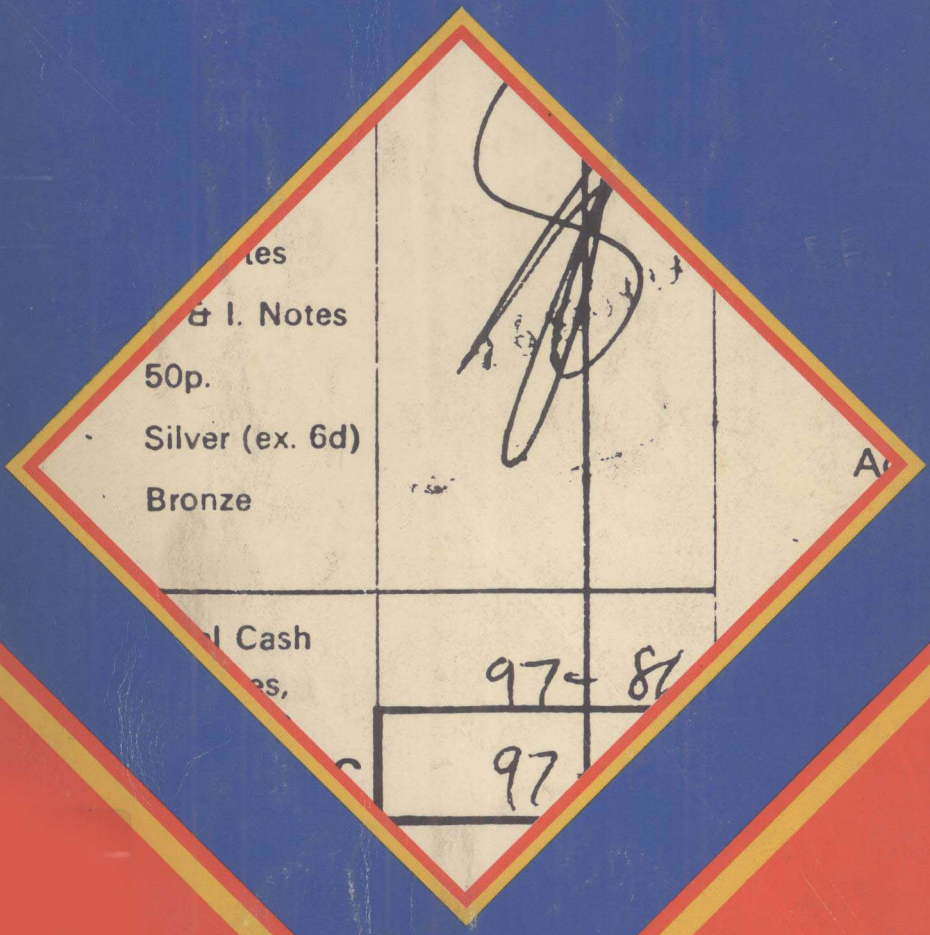
MONETARY ECONOMICS

Geoffrey E J Dennis



Monetary economics

Geoffrey E J Dennis

Longman
London and New York

Longman Group Limited
Longman House
Burnt Mill, Harlow, Essex, UK

Published in the United States of America
by Longman Inc., New York

First published **1981**

British Library Cataloguing in Publication Data
Dennis, Geoffrey Edwin Janes
Monetary economics. – (Modern economics).
1. Money
I. Title II. Series
332.4 HG221 80–40095
ISBN 0–582–45573–1

Printed in Great Britain by William Clowes (Beccles) Ltd.
Beccles and London.

Monetary economics

Modern economics
Series editor: David W. Pearce

Economics of the labour market D Bosworth and P Dawkins
Basic econometrics M S Common
Theory of the firm M A Crew
Monetary economics G E J Dennis
Development economics S Ghatak
The political economy of Marx M Howard and J King
Welfare economics P Jackson and D T Ulph
Social economics K Lee and P Mackie
The economics of public transport C A Nash
Environmental economics D W Pearce
Microeconomics H Gravelle and R Rees
Macroeconomics A J Westaway and T G Weyman-Jones
Mathematical economics J E Woods

Preface

Monetary theory and policy is a rapidly developing subject area of economics. The conventional wisdom concerning the central issues of monetary economics has moved through a variety of basic theoretical stances in the post-war period. The importance of the money supply and monetary targets to the application of policy in the 1970s, apart from any theoretical refinements that may occur, should ensure that many more developments will occur in the near future, some no doubt before this volume actually appears on the bookshelves. Therefore, any textbook on monetary economics is essentially marking time and this volume is no exception.

The book provides a simple introduction to the essential issues of monetary economics as they stand at the end of the 1970s. The objective is for the book to be used by second year undergraduates who are studying a general macroeconomics course or those doing a specialist course on monetary economics in the second or third years of a degree course. In addition, any student embarking on postgraduate study that includes monetary economics should consider this book as being introductory reading.

The theoretical content of the book is presented in a familiar form, although in Chapters 1 and 9 in particular, considerable reference is made to current practice on the use of money supply definitions in the UK and to recent empirical UK evidence on inflation. The emphasis of any empirical evidence and institutional detail is on the UK economy for two reasons. Firstly, many excellent textbooks written in the environment of the US monetary system already exist while the second reason is simply one of space. It is intended that the major source of product differentiation in this volume will therefore be the combination of monetary theory and practice, including empirical evidence, contained in Chapters 2, 6, 7, 8 and 10. These chapters include an analysis of the targets and indicators of monetary policy, the determination of the money supply, the influence of external money flows on the domestic monetary situation, a survey of empirical evidence on money and an analysis of post-war monetary policy, all in the context of the British economy.

I would like to express my gratitude to Tim Congdon, Peter Dawkins, Nigel Duck, Chris Gill, John Presley, Graham Smith, Brian Tew, Tony Westaway, Tom Weyman-Jones and Geoff Wood who made valuable comments which have improved this book or sharpened up my understanding of the subject through discussion. I would like to thank Max Hall, for access to some material on monetary policy since 1971, and in particular David Llewellyn who has improved my knowledge and grasp of this subject area by his useful insights into the operation of monetary policy in the UK and by encouraging justifiable scepticism in some of the conventional theory of the subject. My gratitude goes to David Pearce, the editor of the series, for his initial encouragement and for his advice during the completion of the manuscript. In addition, I am grateful to an anonymous reviewer who pointed out a number of inaccuracies and confusions. The responsibility for any remaining errors and omissions lies solely with the author. Particular thanks go to Gloria Brentnall for her speedy and efficient preparation of the final typescript and also to Linda Brewin, Brenda Moore, and Su Spencer for their typing services.

Geoffrey E. J. Dennis

University of Loughborough

For My Family

Contents

Chapter 1

An introduction to money

1 Introduction

The basic starting point for a study of monetary economics should always be an analysis of the concept of money itself. Money is, by definition, the basis of the branch of macroeconomics called monetary economics that is the subject of this volume. Perhaps surprisingly, considerable debate has ensued over the functions of money, the advantages of a monetary economy over one where money is absent – a barter economy – and the appropriate definition of money in theory and practice. These issues, although not central to the study of monetary economics, are a vital element in the subject and are therefore treated in this initial chapter. A viable study of the role of money in an economy is meaningless unless the arguments surrounding the concept itself are set out in detail and appreciated.

2 The functions of money

In general money is often defined in one of two ways. Firstly, it is anything acceptable in payment for goods and services or in settlement of a debt. Secondly, money is regularly defined in terms of the functions that it performs i.e., money is a commodity that functions as a medium of exchange, store of value, etc. Clearly neither of these definitions is very satisfactory. In the first case how is acceptability to be defined? For example, it is true that certain forms of money (even a cheque drawn on a current account at a clearing bank) may not be acceptable to all people in all circumstances. There may therefore be a lack of uniformity in this acceptability criterion. The second definition suffers from the problem that it may not be easy to identify which assets actually perform these functions. In this case, in fact, this is not a true definition but simply a listing of the functions that this elusive concept performs. More rigorous methods of defining money will be introduced later in this chapter.

There are three major functions of money which will be analysed in turn. Firstly, money acts as a medium of exchange. It is an intermediary that can be used in exchange for goods and services in an exchange transaction. A

barter economy requires the need for a person wishing to sell, for example, 1 sheep for 100 bushels of corn to find someone who both wants to buy the sheep and sell the corn at the same time and at the same exchange rate. This 'double coincidence of wants' is avoided in a monetary economy. The seller would exchange his sheep for money in a market place and then move around with his money until he found the corn required. This role of money as a medium of exchange divides the double coincidence of wants into two separate transactions (which will be far less costly than the one barter exchange). To ensure that money performs this function it is essential that the medium of exchange is widely acceptable and has the confidence of all traders. If this does not exist, money will not be used and barter will be restored.

Shackle (1971) has noted that the unified analysis of money as a means of payment and a medium of exchange confuses a basic issue. A transaction may be facilitated by the presentation of a medium of exchange but not accompanied by an actual transfer of wealth (e.g., through the use of a credit card, or the signing of a hire-purchase agreement). Credit is acting as a medium of exchange but not a means of payment. Payment will actually occur later when the credit balance is settled or the hire-purchase agreement expires. Strictly, therefore, in a sophisticated modern economy the two functions of a medium of exchange and a means of payment should be distinguished.

A second major function of money is as a store of value. This function is an essential counterpart to the role of money as a medium of exchange. The division of one barter transaction into individual acts of sale and purchase implies that it should be possible to complete the two transactions at different points in time. For this to be possible, the money held in the interim period between sale and purchase should store well. This involves convenient storage at no cost to the holder so in general ruling out perishable goods and very bulky commodities. Clearly many assets act as a store of wealth in a modern economy (e.g., houses, cars, government bonds). The distinguishing feature of money as a store of value, however, is its liquidity. In fact, it is the ultimate liquid asset (where the degree of liquidity is defined as the ease of switching without cost from an asset into money). Money can be used immediately for a transaction when the need arises.

Clearly without its store of value attribute one of the benefits of money acting as a medium of exchange (that of separating in time the sale and purchase transactions) would be lost. The two functions combined can be termed the action of *money concrete* i.e., money acting as a tangible asset that facilitates exchange.

Alternatively, *money abstract* involves the action of money in a less tangible sense and represents the final major function of money. This is money as a 'unit of account' or 'numeraire'. It acts as a standard or common denominator against which the value of all goods is measured. We will return to the exchange of sheep for corn. In a monetary economy, the exchange value of 1 sheep may be set by trade at 200 units of money. If the value of 1 bushel of corn was agreed to be 2 units of money, the function of money as a unit of account enables the exchange rate of 1 sheep for 100 bushels of corn to be finalised.

Money acting in this way is inbred into individuals in a society. For example in the UK, we grow up to value items in terms of the pound sterling and may face preliminary difficulties when travelling abroad where a different unit of account is operating. The value of this function was clearly demonstrated by the initial problems experienced in the UK when decimalisation occurred in February 1971. The pound ceased to have 240 equal units (pennies) and began to have 100 equal units (new pennies) instead. All that was happening was the alteration of the unit of account so that 1 new penny equalled 2.4 old pennies, with the value of each commodity adjusted accordingly. As a unit of account, therefore, money transmits information about the relative values of different commodities and by doing so facilitates the operation of the price mechanism. A unit of account need not, however, be a means of payment or medium of exchange. At present this applies to the various accounting devices used in the European Economic Community (EEC), e.g., the European unit of account (EUA).

A fourth function of money sometimes defined is as a standard for deferred payments. This involves the use of money to bridge the gap between the time of an exchange being struck and when payment is made. Money provides a standard in which future payments can be measured. However, it is sensible and more convenient to assimilate this function into the three major ones described earlier in this section.

3 The monetary economy

The major advantage of introducing money into a barter economy is the reduction of transactions costs that will follow from the replacement of the need for the double coincidence of wants by two individual transactions. This gain has been very lucidly rationalised in the well-known model of Clower (1969). The costs of barter are in two forms. Transactions costs are the costs of actually undertaking and completing trade. The transactions cost per unit exchanged will decline as the transactions period (the length of time between each expedition to trade) increases. This assumes that a few large transactions are less costly than numerous small ones. The second type of costs are waiting costs. These are partly subjective in form as the purchase of a desired commodity may be postponed. However, they will also have the objective form of storage costs (particularly of perishable goods) and the interest foregone on an asset the purchase of which is postponed. These waiting costs will rise as the transactions period increases.

The total costs of barter can therefore be represented as a **U**-shaped function (C_0) in Fig. 1 being the sum of the transactions and waiting costs. According to this model, the individual can either not trade at all or engage in one individual double coincidence transaction. What is omitted is the possibility that an individual may give up time and therefore output to accumulate information on trading possibilities and so maximise welfare in the long run. He may also, which is not made explicit in this model, engage in a series of transactions to gain the commodity he requires in the right quantities. Having accumulated information, it may be to the transactor's advantage to exchange sheep for

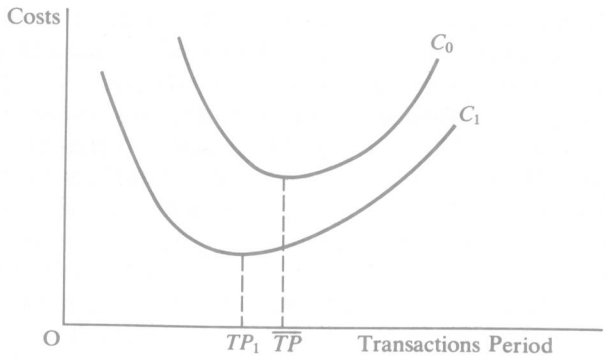


Fig. 1. Exchange costs in barter and in a monetary economy.

fish, fish for chickens, and then chickens for the corn he actually requires. This is called a transactions chain (Brunner and Meltzer, 1971).

Such a transactions chain may reduce costs and therefore increase welfare, but significant cost reductions will only occur when more convenient trading relationships are instituted. These developments may involve a 'fair-ground' (where transactors are brought together), a situation where a small number of dominant commodities act as exchange media and eventually a monetary economy where one commodity is defined and accepted as a medium of exchange. The major gains from introducing money can be summarised as a decline in transactions costs (but not waiting costs) which lead to a downward and leftward shift of the cost curve (C_1) in Fig. 1. The optimal length of the transactions period will fall from $\overline{TP}$ to TP_1 giving the result that, with money, an individual will trade more regularly than in the more costly barter situation.

The decline in transactions costs as a society develops from a barter system to a monetary economy, takes many forms. In a world of uncertainty (where information is not perfect), the use of money permits a reduction in this uncertainty by reducing the costs of obtaining full information. This is most easily seen in the action of money as a unit of account. If there were 50 commodities being produced and traded in an economy each would have an exchange value against the other. This situation can be demonstrated in a 50×50 matrix as in Fig. 2. There are n^2 exchange rates in the matrix (where in this case $n = 50$) although n diagonal elements are unity by definition (the exchange rate of 1 sheep against another is 1, assuming they are of the same standard). Therefore, there are $n(n-1)$ other exchange rates in the matrix. However, half of these provide no new information as the exchange rate of 1 sheep for 1 cow is the same as the inverse of the exchange rate of 1 cow for 1 sheep, that is:

$$E_{ij} = \frac{1}{E_{ji}} \qquad [1]$$

where E is the exchange ratio between goods i and j. Therefore, there are $\frac{1}{2}n\ (n-1)$ independent exchange rates in the matrix. For $n = 50$ goods, this

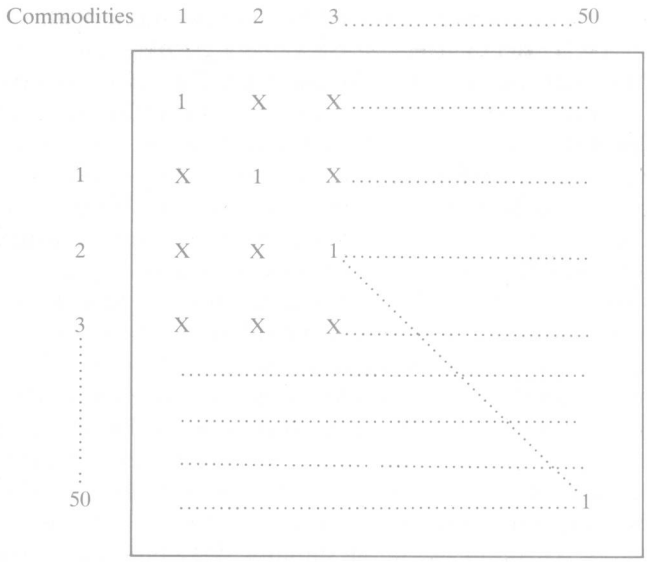


Fig. 2. An exchange rate matrix.

totals, 1,225 exchange rates. The utilisation of one of the commodities as money reduces the information required for trade to only $n-1$ or 49 separate exchange rates. The 50×50 matrix in Fig. 2 becomes a 50×1 vector, where the first good is money. Therefore, money reduces the costs of acquiring full information on trading possibilities and thereby reduces uncertainty. The increased access to information also permits the quicker location of transactors with the necessary goods to sell for money or willing to accept money for goods possessed by the individual. Finally, knowledge of the properties of the goods being sold can be obtained more readily as the general store of information is enhanced (Brunner and Meltzer, 1971).

A second facet of gains from the use of money follows from this reduced uncertainty. The smaller effort needed to complete a given volume of transactions increases the time available for either production or leisure. If production and therefore employment and living standards are increased this is a direct gain from the use of money. On the other hand, if the increased time is devoted to leisure, the welfare of the individual will increase. This is an advantage accruing from money as a medium of exchange.

Other gains have been less prominently argued but are also important. The use of money enables the separation in time of the acts of sale and purchase, while if the money type is sufficiently divisible certain previously impossible transactions may now take place. For example if a trader will not accept 1 sheep for the 1 cow he has for sale, he cannot divide the cow to facilitate the exchange. The use of money will, however, enable this deal to be struck. Finally, money holding may yield non-pecuniary returns which should be considered.

It is important to note that further developments of a monetary

economy can provide new benefits. The addition of *fiat* money (where the face value of the money is greater than its intrinsic value, e.g., token coins, bank notes) to a stock of commodity money can yield new gains. Resources are saved in the production of such fiat money with seignorage (i.e., the difference between the face value of the money and its cost of production) accruing to the issuing authorities. When financial confidence and stability reach a certain level, commodity money can also be augmented by claims on the ultimate commodity itself. This is the natural development of bank accounts where cheques drawn against these accounts circulate in the settlement of debt in place of money. This facilitates the development of a private payments system and eventually a fractional reserve system. In such a system a bank retains a certain proportion of deposits in cash or some other liquid form and uses the remainder for long-term assets. The cash and liquid assets held are usually termed a bank's *reserves*. From experience of people's behaviour, a bank believes that every depositor would not arrive at the bank simultaneously, and demand encashment of deposits. If they did, the bank would have to 'close its doors'. The chosen ratio of reserves to deposits gives the banks just sufficient cash to satisfy normal daily cash demands. As confidence in the stability of the financial system grows this prudential reserve ratio will decline. The development of a fractional reserve system enables a given stock of cash to pyramid into a much larger stock of bank deposits. These institutional developments increase the benefits of a monetary economy where more sophisticated money types are introduced.

The gains to society from introducing money are therefore immense. However, a monetary economy does also have certain disadvantages which in rare circumstances are sufficiently powerful to cause money to be abandoned. These costs mainly revolve around Say's Law (1803). This law states that supply creates its own demand. In a barter economy, this is clearly true as the act of supply (sale) corresponds to the act of demand (purchase). Temporary disequilibria may occur with the producer being unable to sell all his output or alternatively unable to satisfy the whole market. In these cases an output adjustment would occur with long-run equilibrium, ensuring the satisfaction of Say's Law.

However, when money is introduced into a barter economy, the need for a 'double coincidence of wants' is removed by dividing the exchange into two separate transactions. The commodity to be sold is exchanged for money which is then exchanged for the good demanded by the individual. However, a leakage of money from the system will occur if the supplier does not use the money received to purchase other goods. Supply and demand are not equal. When this occurs equilibrium will only be attained where such leakages are matched by other injections of money (e.g., investment). In an open economy with a government sector, the leakages and withdrawals concerned are greater in number than set out in the previous sentence and the equilibrium condition becomes:

$$\underset{\textit{withdrawals}}{S + T + M} = \underset{\textit{injections}}{I + G + X} \qquad [2]$$