

Financial Innovation and the Money Supply

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Preface

Financial innovation has been an acknowledged, but virtually unexplored, area of economics. The monetarist counter-revolution focused attention on the salubrious effects of the control of the money supply in free market economies. It inspired the targeting of the growth rate of the money supply, which has become a feature of economic policies since the 1970s. Yet perhaps the most remarkable development has been the pace, variety and ingenuity of financial change, leaving in its wake increasing confusion about what constitutes the money supply in sophisticated, changing economies.

While claiming that its demand function was stable and its control easily achievable, monetarists presented money as an enduring asset, possessing certain unique attributes. 'Monetary' assets, however, can be created in the course of business interaction by private economic agents motivated by self-interest. Monetary restrictions induce a creative response as a consequence of which the economy can monetize other assets and alter its financial procedures and structure. It is in this context that financial innovation is presented as an under-researched topic worthy of further investigation. The book offers a perspective on existing knowledge in this field and identifies areas where new enquiries are needed.

Financial innovation, as portrayed by current literature, may give the impression that it is a phenomenon of the 1970s, coinciding with a 'breakdown' of the standard demand-for-money functions. Here it is presented as a fundamental constituent of a complex process of financial evolution, and not merely as an isolated episode in modern financial history. Indeed, it is the ancient art of overcoming constraints by creative reaction that reshapes financial markets, making them more perfect. But it is on modern innovations that attention is focused.

The impact of computer and information technology, together with competition, deregulation and financial integration at an international level, have made modern financial markets highly interdependent, flexible, contestable and conductive; but, above all, they have infused into present-day open

economies a high potential for circumventive innovation, capable of altering unpredictably the relationships between variables upon whose stability the effectiveness of monetary control depends. Modern economies are thus post-money societies, where traditional distinctions between 'monetary' and 'financial' assets are too fuzzy or ephemeral to be meaningful and where observed 'monetary' regularities are likely to disintegrate once the pressure of policy is put upon them.

Part I is essentially introductory, outlining the theoretical foundations of current monetary policy design, viewing these against a broad historical background, examining the circumstances in which the modern stress on money emerged, and presenting the financial system as an evolving, flexible and increasingly interdependent mechanism generating 'financial' and 'monetary' assets and services.

Definition, identification and measurement of money in developed and changing financial systems are discussed in Part II. Intractable difficulties emerge in the search for a 'money' for purposes of macroeconomic control. Some of them are reflected in the proliferation of 'definitions' of money and in incessant adjustments to monetary aggregates and targets.

Financial innovation receives extensive treatment. References to it are made throughout the text, but in Part III it becomes the principal strand. Selected financial innovations in the USA and the UK are discussed, but the importance of 'swarms' of innovations embodied in the Eurocurrency system, liability and cash management are especially accentuated. Tentative hypotheses about innovation-inducing conditions, diffusion processes and implications to traditional monetary theory and policy are explored.

The book raises a number of neglected yet important questions which challenge the accepted monetary orthodoxy and the wisdom of targeting the money supply. These issues, hitherto overshadowed by the inertia of concentration on the money supply-demand paradigm, deserve wider exposure and debate by academics and those engaged in banking and finance.

The text avoids technical detail and concentrates on broad issues, mainly using basic monetary theory; it avoids institutional detail, while stressing institutional change, its causes and its consequences; it avoids, as much as possible, duplicating existing texts. With such an approach, a certain threshold understanding of modern monetary economics is assumed. Thus, the book is likely to be most accessible to readers who have completed at least the first year of a standard undergraduate course in economics, essentially because certain theoretical and institutional knowledge is taken for granted.

It is hoped that the book will also interest those with more advanced economic training by drawing their attention to topics that are frequently overlooked, and that its basic message will be understood by those with a more modest training in economics. Careful documentation has been built into the text to enhance this flexibility, enabling the reader to seek introductory as well as more advanced references.

This book has been completed in a short space of time, when pressures of dwindling resources generally discouraged academic achievement. Inevitably, in such circumstances it owes its existence not solely to my own efforts, but also to the indulgence and understanding of colleagues and those close to me. To them and to an anonymous reader, whose comments proved to be most valuable, I am very grateful. Naturally, I alone am responsible for any shortcomings.

Special tribute must be reserved for my wife, Lesley, and for Barbara Watson, who had to decipher my hieroglyphic script. Lesley, in addition, valiantly overcame a spiteful word processor which insisted that every other file of the book should be regularly wiped out! Sue Corbett, the publisher's economics editor, proved to be most understanding and encouraging.

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— Part I —

Introduction: Money and the
Financial System

Setting the Scene on Money

1.1 Money supply targets: a theoretical background

This book focuses on the nexus between the money supply and financial change, and in particular on the interrelation between monetary restraint and financial innovation. The subject is topical, since current economic policies in the West embody a strong emphasis on the control of the money stock. The theoretical inspiration of such policies, widely introduced in the mid-1970s, is the version of the quantity theory associated with Milton Friedman. The theoretical macroeconomic role of money proposed by the theory, together with its policy prescription, are sketched below. A critical evaluation and the usual contrasts with 'Keynesian' theories are omitted, for they can be found in profusion elsewhere.

The control of the money supply as an economic strategy is a recurrent theme in monetary economics. In this chapter, a broad historical perspective is given (section 1.2). This is followed by an interpretation of the evolution of the current emphasis on money as a key macroeconomic variable. Discussion is slanted towards difficulties encountered in defining money when the financial system is undergoing change, which is a principal theme developed in the rest of the book. Readers are assumed to be familiar with the basic monetary macroeconomics currently in vogue; for this reason treatment is highly concentrated and, at times, mechanical. Some theoretical concepts used here are utilized frequently in the remainder of the book.

1.1.1 *Basic monetarist theory*

Basic macroeconomic analysis today stresses that output (Y) and the price level (P) are determined by the forces of aggregate supply (AS) and aggregate demand (AD).¹ Readers should be aware that these concepts are complex and controversial, and it should be reiterated that the quantity theory interpreta-

tion is outlined mainly as a theoretical background to the current policy design.

In the monetarist economic scheme, the AS incorporating the assumption of perfectly competitive factor markets is usually portrayed as a perpendicular function in the P - Y space (figure 1.1), with real factors determining the 'natural' rate of output (corresponding to a 'natural' rate of employment).

AD reflects desired expenditure at various combinations of price levels and output. It can be derived from the IS - LM analysis (incorporating flexible prices) with which most students of economics are familiar and which is briefly summarized in the appendix to this chapter. At a given price level, AD is a locus of points at which the money market and the real sector are in equilibrium at various interest rates and corresponding income levels (see appendix). Monetarists believe that it is changes in the monetary demand (viz. in nominal money supply M – see (A1.18) and (A1.18a) in the appendix) that exert the decisive influence on the aggregate demand. At a given price level, AD would rise (shift to the right) mainly following a rise in M and fall (shift to the left) following a fall in M .

In a market economy where markets operate freely and flexibly, the equilibrium level of prices and of income (output) would be determined by the interaction of AD and AS . With reference to figure 1.1, given AS_0 and AD_0 , in equilibrium, the price level P_0 and output Y_n would result. In such a scheme, changes (shifts) in AD would lead to price changes without altering output. Thus, a rise from AD_0 to AD_1 would result in the price increase to P_2 without affecting Y .

However, in real life, which brings with it price and wage inflexibilities, changing expectations, various 'frictions' in exchange and production (such as contractual stickiness) and adjustment delays, responses to changes in AD may not simply be traced out along AS . The essential features of these may be captured by including in the analysis a short-run aggregate supply curve (SAS in figure 1.1) which conveys market imperfections or a state of expectations of prices. The flatter the SAS schedule, the greater are assumed to be market frictions or expectational discrepancies. Thus, a rise in AD from AD_0 to AD_1 , would, if SAS_0 were the effective aggregate supply relationship, result in output increase to Y_1 and price increase to P_1 .

Schools of thought that find their root in classical free market theories regard all deviations of output and prices from equilibria depicted by the equality (intersection) of AS and AD in the model in figure 1.1 as transient or temporary, requiring no external remedial intervention or guidance from the state (by demand management). Thus, point Z_1 in figure 1.1 represents a state of full (multi-market) equilibrium, but a rise in AD_0 to AD_1 may involve some temporary stickiness on the supply side of the economy and a movement along the SAS_0 schedule to Z_2 , during which both prices and output rise to P_1 and Y_1 , respectively. However, 'catching-up' adjustment processes will develop, and SAS will drift upwards (along Z_2Z_3), raising prices and

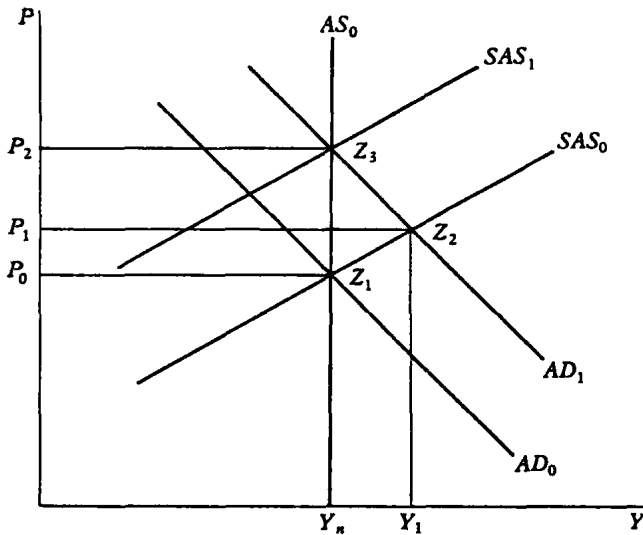


Figure 1.1 Determination of income and price level.

reducing output until final equilibrium is established at Z_3 , resulting in a higher price level at P_2 but with output at the original, 'natural' level.

This is a simplified version of an economic mechanism associated with the followers of Friedman, who claim that a rise in the nominal supply of money would lead to a temporary output (and employment) rise, but that in the long run adjustment would be solely in the price level. Thus, *money is neutral in the long run, but not in the short-run*. 'I regard the description of our position as "money is all that matters for changes in nominal income and for short run changes in real income" as an exaggeration but one that gives the right flavour to our conclusions' (M. Friedman, 1970, p. 217).

The long-run neutrality of money is highlighted: 'We shall regard long-run equilibrium as determined by Walrasian equations of general equilibrium, which determine real variables, plus the quantity theory, which, for given real variables, determines the price level' (Friedman and Schwartz (hereafter F-S), 1982, p. 60). Money supply changes always affect the price level, and 'inflation is always and everywhere a monetary phenomenon' and can be counteracted only by monetary means.

The adherents of the 'new classical macroeconomics' (NCM), which links the principles of general equilibrium with rational expectations hypothesis, claim that, provided a change of monetary policy is properly announced and thus anticipated by economic agents, it would lead to a change in the price level without disturbing real variables. This is the so-called 'policy impossibility theorem', implying that a rise in the nominal quantity of money would

result in an immediate shift of AD from AD_0 to AD_1 in figure 1.1 along Z_1Z_3 , leading directly to the price increase from P_0 to P_2 . However, a shock or 'surprise' monetary rise, not anticipated by economic agents, would lead to movements of output and prices initially along SAS_0 , before final adjustment at Z_3 .

1.1.2 *Control of the money stock: objectives*

Currently pursued monetary policies in the West have their origin in the Friedman version of monetarism, and references to monetarists in the remainder of the book are essentially to the Friedmanite variety. NCM, which may be considered to be, in a theoretical sense, as much contrary to Friedmanite monetarism as it is to varieties of 'Keynesianism', is still regarded by politicians and central bankers as an academic research programme. Friedman and Schwartz (1982, p. 65) consider that 'the theory of rational expectations has been extremely fruitful on an analytic level but as yet is in a preliminary stage as a source of empirically testable hypotheses about the formation of expectations.'

The money neutrality theory links monetarists with their classical predecessors. 'Money is a "veil." The "real" forces are the capacities of the people, their industry and ingenuity, the resources they command, their mode of economic and political organisation and the like.' Nevertheless, 'there is hardly a contrivance man possesses which can do more damage to a society when it goes amiss' (F-S, 1963a, pp. 696-7). In another context, Friedman (1968b, p. 371) agreed with J. S. Mill that money was an 'extraordinarily efficient machine' facilitating exchange. 'Because it is so pervasive, when it gets out of order, it throws a monkey wrench into the operation of all other machines.'

The principal aim of a monetarist policy is thus to stop money going amiss. Monetarists claim that there is only one safe way of doing this. Although the theoretically postulated relation between money and variables such as nominal income is stable and reliable, especially over long runs, empirically it is not precise and is subject to variable time lags. Over very short periods it is indeed 'loose'. Furthermore, information about the state of the economy and the lags involved in political decision-making all militate against policies of discretionary, anticyclical changes in the quantity of money. 'Too late and too much has been the general practice' (Friedman, 1968a, p. 373).

Indeed, activist policies are considered to be a major independent source of economic instability. Friedman's famous prescription for achieving stability in the economy is for monetary authorities to adopt 'publicly the policy of achieving a steady rate of growth in a specified monetary total' (1968b, p. 373).

In spite of methodological and theoretical differences between NCM and other schools of thought, NCM's policy prescriptions, at this stage of the

school's development, coincide with those of the followers of Friedman (see Lucas, 1981, pp. 249–60; Minford and Peel, 1983, pp. 79–92). An adherence to rules of behaviour, such as a long-run k per cent growth rate of the money supply, is advocated. Such a prescription is not considered to be optimal, but in the 'present state of knowledge' and 'with the currently available expertise' in policy-making, simple rules are preferred to activist policy (see, e.g., Lucas, 1981, esp. pp. 248–61; Minford and Peel, 1983, esp. ch. 5). It would provide the economy with a stable monetary environment in which agents could undertake their decisions knowing what they could expect money and price levels to be in the future. This policy congruence provides a justification for not giving considerably more attention to NCM throughout the book.

To conclude, for monetarists and NCM, the quantity of money is a critical variable for controlling the level of prices, being, certainly in the long-run, unable to influence the real economy. Monetary policy, in the context of traditional demand management, is superfluous and potentially harmful, for increases in AD might bring about some unnecessary transient disturbances, ultimately and inevitably resulting in inflation. Monetary policy should thus be passive, designed to control the *growth of the money stock at a steady rate*. No other role is envisaged for state intervention except perhaps measures to free the price mechanism from unnecessary frictions by various ways which today are often labelled 'supply-side economics' (e.g., lower income taxes as a way of improving incentives, trade union legislation as a way of counteracting monopolistic power in labour markets, privatization as a way of increasing competition).

1.1.3 *Monetary targets: 'practical monetarism'*

High rates of inflation, accompanied by heavy unemployment in the 1970s, created a climate conducive to the abandonment of the orthodox remedies of demand management and made the simple monetarist prescriptions appealing as a political and economic alternative. The same high rates of inflation also made it difficult to adopt the steady k per cent rule. It was felt that 'practical monetarism', in the form of policies of steadily falling intermediate monetary targets, was necessary in the first instance to bring down gradually the rate of inflation to a more acceptable level. Thus, short- or medium-term monetary targets became a feature of monetary policies introduced in the 1970s (OECD, 1979; Foot, 1981).

There are also some additional arguments advanced in support of intermediate monetary targeting. Monetary policy is likely to be more effective in a system of floating exchange rates than in a situation of pegged rates. However, under the fixed exchange rate regime governments were forced to exercise some degree of discipline over their domestic expenditure in order to maintain the external value of their currency. Monetary targets are seen as an alternative way of enforcing the maintenance of financial discipline in the

absence of the fixed exchange rate constraint, which was widely abandoned during the 1970s.

Money is often regarded as an information variable. One implication of the hypothesis of a stable relation (but subject to lags) between money and nominal income is that changes in the supply of money contain reliable information about future changes in nominal income or inflation.² Particular emphasis is thus placed on the value of money targeting in influencing expectations. It is claimed that, if money targets were clearly announced and firmly pursued, they would affect expectations of wage and price changes on the part of decision-taking units and would reduce uncertainty. Thus, monetary targets have been introduced in the belief that they would dampen inflationary expectations, and in this context they were compared to an aspect of the old-fashioned 'moral suasion' (Sumner, 1980, p. 109).

The importance of the announcement effect is stressed particularly by the NCM. It should, however, be remembered that the strength of this psychological effect depends on credibility; frequent changes in targets, overshoot targets and observed failures to achieve expected ultimate results would substantially weaken its impact.³ Little evidence is available on the strength of the announcement effect. Nevertheless, it is often prominent among arguments in favour of targeting the money supply (see, e.g., Bank of England (hereafter BE), 1978, p. 34); to some, it is a *sine qua non* of successful targeting (e.g., Sargent, 1981, p. 101).

Monetary targets are also said to set a clear aim for monetary authorities and a more precise and objective measure of success of central bank control procedures than the traditional policies designed directly to influence nominal income or the price level. Thus, by observing the marksmanship of monetary authorities, their technical competence can be assessed more objectively (Sumner, 1980).

Targeting is a two-stage procedure involving questions of controllability and causality (Courakis, 1981, pp. 286–93; Bryant, 1983, ch. 8). First, monetary authorities, by manipulating monetary instruments such as interest rates (used by the authorities in the UK) or monetary base (advocated by monetarists), attempt to hit the monetary target previously announced by the authorities. Second, the adjustment of nominal income to the targeted money rests on the proposition that a stable and predictable relationship does exist between the money supply and nominal income. This scheme is consistent with the economics of the demand for money outlined in section 1.4.

The quantity theory indicates that only one 'money' should be targeted. For a long time, Friedman held a strong and unwavering view on the selection of the 'money' supply for purposes of control based on money targets. In his seminal work on monetary policy (1968b) he stated that 'monetary total is the best currently available immediate guide or criterion for monetary policy – and I believe that it matters much less which particular

total is chosen than that one be chosen.' Viewed against the background of the 1960s, when it seemed that the 'definition' of money did not matter (see section 1.4.2), this statement is not, perhaps, astonishing, and appears to stress the need for monetary discipline in economic policy. What is astonishing is that, after considerable accumulation of experience suggesting that the growth of various monetary aggregates can vary in opposite directions, Friedman's view has not altered. He reiterated recently: 'It matters far less whether that aggregate is M1-A or M1-B, M2 or M-n than that a single aggregate be chosen' (1981b, p. 6). Among other procedures, he urged that a long-term target path be set 'for a single aggregate – for example M2 or the base. It is less important which aggregate is chosen than that a single aggregate be designated as the target' (1982, p. 117).

The selection of a 'money' as a target variable is not central to the main theme of this book. It emphasizes, however, the need to investigate carefully the nature and problems of defining and measuring money, which, as we shall see, is not easy in our changing financial environment.

1.2 The meaning of money: a historical perspective

Modern monetary theory has developed as if no serious problems with the meaning and definition of money existed, or as if these problems were, at worst, rather semantic, or a matter of selecting an appropriate M from officially published 'money' series. The Governor of the Bank of England (BE, 1973, p. 193), having observed that there might be many different definitions and computations of the money supply, suspected that 'a number of people who make confident pronouncements about the money supply have never stopped to ask themselves which version they have in mind and why. Yet it does make a difference.'

When economists do focus on the question of what constitutes money in an economy, serious disagreement emerges. This is by no means a new phenomenon. Macroeconomic thought has been dominated by a search for a variable called 'money' which is definable, quantifiable, controllable, and linked in a stable and predictable way with other macroeconomic variables such as nominal income or the price level. Yet it has been one of the more curious characteristics of monetary debate that controversies concerning the role of money in the economy proceeded without a clarification of the underlying concept of money, and certainly without a clear indication of what constituted the money stock of the theoretical discourse. Nevertheless, in major polemics in monetary history, the view taken, often implicitly, on the meaning of money was connected with the broader vision of monetary macroeconomics (Johnson, 1962, pp. 351–5).

At the turn of the century, A. P. Andrew (1899) observed that

It is a singular and, indeed, a significant fact that, although money was the first economic subject to attract men's thoughtful attention, and has been the focal centre of economic investigation ever since, there is at the present day not even an approximate agreement as to what ought to be designated by the word. [Andrew, 1899, p. 219]

Some economists confined money to mean legal tender; others broadened it to include a variety of financial instruments and even further, so that 'in the end all goods are of the nature of money in so far as they possess a value in exchange . . . such is the bewildering confusion of language which confronts the student of monetary problems on the very threshold of his investigations' (p. 224).

The situation today is no different. 'While economists have probably spilled more printers' ink over the topic of money than any other, and while monetary theory impinges on almost every other conceivable branch of economic analysis, confusion over the meaning and nature of money continues to plague the economics profession' (Davidson, 1978, p. 140). Though the fluidity of concepts is not unusual in social sciences, the terminological confusion and the lack of a generally accepted notion of money make it difficult, if not impossible, to carry out a systematic investigation of the role of money in the economy.

1.2.1 *Currency theories of money*

Indulging in very broad generalizations, we can identify two principal strands of thought concerning the meaning attached to money in monetary controversies. Some economists tended to regard money as a clearly identifiable and homogeneous asset. We shall label such views 'currency theories' of money, whose antecedents are to be found in the well-known nineteenth-century bullionist and currency school propositions.⁴ Such theories were predominantly catallactic, with a strong emphasis on the importance of a medium of exchange to the effective development of the economy. They overshadowed state or chartalist theories of money, which also looked for a specific definition but stressed money as a creature of the law (Knapp, 1924), and the pervading influence of government sovereignty and legislative force in settlements of trade contracts.⁵

Currency theories tend to define money narrowly, often in terms of a commodity or quasi-commodity standard, and also to stress the enduring and robust character of money thus defined. In their scheme, money remains essentially the same institution as that which has overcome the inefficiencies of primitive barter. Its source is somehow largely independent of the activity within the economy (that is, money is exogenous), and it retains the same basic features regardless of the changing commercial and technological complexities of economic processes as the economy advances. The develop-