

Unpacking the Post Keynesian Black Box:

**Wages, Bank Lending
and the money supply**

Basil J. Moore

Wesleyan University

Spring 1984

Thames Papers in
Political Economy 10

Thames Papers in Political Economy are a series of papers produced by the Economics Division of the School of Social Sciences at Thames Polytechnic, and the Department of Applied Economics, Faculty of Business at North East London Polytechnic. Their purpose is twofold: firstly, to stimulate public discussion of practical issues in political economy; and secondly, to bring to the notice of a wider audience controversial questions in economic theory.

The School of Social Sciences is responsible for running the BA degree in Political Economy and the BA degree in Sociology. The Department of Applied Economics is responsible for running the BSc degree in Applied Economics. Both departments offer facilities for research in economics leading to MPhil and PhD degrees of the CNA.

The editors of the series are Philip Arestis and Thanos Skouras; the other members of the editorial board are: Sami Daniel, John Harrison, Klaus Heidensohn and Gregor Koolman.

Contributions in the area of Political Economy are welcomed. Papers should be sent, one copy each, to the editors at the following addresses:

Philip Arestis

Economics Division, School of Social Sciences
Thames Polytechnic
Wellington Street
London SE18 6PF

Thanos Skouras

Department of Applied Economics
Faculty of Business, North East London Polytechnic
Longbridge Road
Dagenham
Essex RM8 2AS

Copies of the papers (and relevant information) including past copies, are available from Mrs. S. Kneale (School of Social Sciences, Thames Polytechnic).

ISBN 0-902 169-24-6

Unpacking the Post Keynesian Black Box: Wages, Bank Lending and The Money Supply*

"Monetary theory is less abstract than most economic theory; it cannot avoid a relation to reality, which in other economic theory is sometimes missing"

Sir John Hicks (1967), p.156

Introduction

Monetarists have frequently been accused of having a 'Black Box' in their models; this is so because they have been unable to specify the transmission mechanism by which monetary change appears empirically to spill over so rapidly into product and factor markets. Post Keynesians argue that it is money wage growth which is more nearly exogenous, which central banks 'validate' by adjusting the money stock. But until they are able to specify more closely the mechanism by which changes in money wages influence the money supply, Post Keynesians are similarly open to the accusation of having a 'Black Box'. Why in fact do central banks always accommodate? Lack of 'moral fibre' is surely not a sufficient explanation.

The Quantity Theory

The essence of Monetarism is that the rate of increase of the money stock is the main determinant of the rate of increase of nominal income (Laidler, 1981, Tobin, 1981). Inflation is held to be caused primarily by a rate of increase of the money stock in excess of that warranted by the growth rate of real output. In the long run the behaviour of the real economy is regarded as largely neutral to monetary disturbances, and fully determined by real factors, primarily the rate of growth of the supply of labour and capital, and the rate of technical progress. This leads to the Monetarists' main policy recommendation: a lower rate of growth of the nominal money stock as a necessary and sufficient condition for reducing the rate of inflation over the longer term.

Implicit in this position is the assumption that money has an exogenous supply schedule, which determines the quantity available independent of the demand for it, and which can, in principle at least, be controlled by the central bank (Kaldor, 1982). Monetarists do not recognize the distinction between demand- and cost-inflation. They argue rather that costs are derived from prices, and prices rise due to excess demand in some or all markets as a result of an excess supply of money balances. Central banks are assumed to set the *nominal* amount of money balances, but the *real* amount of money balances demanded is determined by the public's (stable) demand for money function (Friedman and Schwarz, 1982, ch. 2). This has been termed the 'Hot Potato' theory of money (Tobin, 1981). Prices rise as individual households and firms attempt to spend their

excess nominal money balances. But for the economy as a whole the aggregate nominal money stock is exogenously given, as determined by the central bank. Inflation will continue therefore until prices have risen sufficiently to reduce the real value of money balances to their desired level.

Modern Monetarism derives directly from the Quantity Theory of Money, which dominated both economic and political thought in the nineteenth century. The Quantity Theory asserted that the value of money, like any other good, varies in inverse proportion to its quantity. This relationship was expressed in two alternate forms:

$$(1) MV = py = Y$$

$$(2) M = kpy = kY$$

In the first, the 'Fisher' form, velocity (V) expresses the number of times that a unit of money circulates as income each year. In the second, the 'Cambridge' form, k denotes the demand to hold wealth in the form of money expressed as a proportion of annual income.

Marshall and Walras believed that the actual size of money balances (M) was given exogenously by the quantity of gold in existence. The mechanism that brought actual balances into conformity with desired real balances was changes in the value of gold in relation to other commodities. The existence of paper money presented a complication for this doctrine. But it was concluded that provided the banking system worked under rules which maintain a fixed relation between the supply of bank money and an external base, it was still possible to argue that the quantity of paper money in circulation was determined exogenously by the fiat of the monetary authorities. It was not after all the intrinsic value of gold which determined its value, but rather its limited quantity in relation to the demand (Hicks, 1977, pp50-61).

This was the dominant doctrine on which all Anglo-Saxon economists were brought up. Its implications were that inflation is always the result of the 'overissue' of bank notes (to use Ricardo's original expression), whether caused by the financial needs of governments, as in times of war, or the latitude of central banks in permitting the Banking System to extend too much credit.

Keynes' intellectual development consisted of a long struggle to escape from this theory, which he succeeded in doing imperfectly, and only in stages. The first stage was the realization that the labour market is different from commodity markets, in that wages do not adjust demand easily to eliminate excess supply of labour. Hence his opposition to the return to the Gold Standard at pre-war parity after the First World War. He held that the domestic price level was tied to the level of domestic wages, which do not readily adjust downward so as to keep labour supply and demand in equilibrium.

The second stage came with his realization that effective aggregate demand for commodities is not determined by monetary factors, but by autonomous investment and government expenditures, combined with the multiplier, which depended on the stable propensity to save out of income. This meant that saving and investment were brought into equality *ex post* through the adjustment of the level of nominal income, and not, as the traditional theory had it, through movements in the rate of interest. This left the rate of interest "in the air", as Keynes himself put it, until he developed the idea of liquidity preference.

This solution represented a modification of the quantity theory, but not its abandonment. Keynes wrote $M = L(Y,r)$ or $M = k(r)Y$, where $L(Y,r)$ represents the demand for money as a function of both the level of income and the interest rate, while $k(r)$ represents the demand for money expressed as a proportion of income, which is inversely related to the rate of interest. The demand for money will be greater the lower the rate of interest, so that it was the money market which was equilibrated through interest rate adjustment.

Keynes' formulation seemed to imply, to both him and to others, that all the adjustments of monetary to demand factors came through changes in the velocity of circulation. It was this which led economists in the immediate post-war period to downplay the importance of monetary policy. Perhaps the best illustration of this phase is the now extreme-sounding statements of the Radcliffe committee about the variability of velocity:

"We cannot find any reason for supporting, or any experience in monetary history indicating that there is any limit to the velocity of circulation; it is a statistical concept that tells us nothing directly of the motivation that influences the level of total demand."

(Radcliffe, 1959, paragraph 391)

This formulation also persuaded Friedman that the empirical validity of the Keynesian theory depended on the absence of any close correlation between M and Y . If variations in Y result primarily in adjustments of V , then Y and M should not be closely correlated. Friedman's emphatic reassertion of the quantity theory of money was based essentially on the close empirical correlation he found to exist between income and variously defined monetary aggregates, a relationship he found more stable than Keynes' multiplier (Friedman and Meiselman, 1963). Friedman interpreted this empirical stability of velocity as implying a stable demand function for money (Friedman and Schwartz, 1982, ch.2).¹

The Exogeneity of the Money Stock

There is nothing necessarily inconsistent between monetarist reasoning and scenarios in which wage or import price increases induce the monetary authorities to expand the money stock, in order to avoid the short-term increases in unemployment which would otherwise result. But

these issues concerning the behaviour of the monetary authorities, while logically separate from the disputes between Monetarists and Keynesians about the behaviour of the private sector in response to variations in monetary variables, do have a direct bearing on the interpretation of the empirical evidence for the Monetarist explanation of a primarily one-way causal relationship between monetary growth and price inflation.

Monetarists have demonstrated that changes in nominal income, for many countries and over many periods, are systematically associated with changes in the money stock. But a fairly close long-term statistical association is one thing; the direction of the causal influence implicit in this correlation is another. Monetarists are of course aware of the two-way relationship between money and money income. "Changes in the money stock are therefore a consequence as well as an independent source of change in money income and prices, though, once they occur, they produce still further effects on income and prices. Mutual interaction but with money rather the senior partner in longer-run movements and in major cyclical movements, and more nearly an equal partner with money income and prices in shorter-run and milder movements—this is the generalization suggested by our evidence." (Friedman and Schwartz, 1963, p.695). Their case for the exogeneity of monetary change rests primarily on the fact that the money stock is ultimately under the control of the central bank.

The traditional view of the bank money creation process relies on the bank reserves-multiplier relation, $M = mB$, (Cagan, 1965). The central bank is posited to be able to affect the quantity of bank deposits, and thereby the money stock, by determining the nominal amount of the high-powered reserve base (B). The value of the reserve multiplier (M) is determined by the public's currency-deposit ratio and the banks' cash reserve ratio. It can be shown that, except in the very short run, the money multiplier is fairly stable, so that most of the change in the money stock is attributable to changes in the monetary base. Since the base is the liability of the central bank, and so is affected by central bank purchases or sales of financial assets, Monetarists hold that the money stock is ultimately an exogenous variable.²

When money is a metallic money, its supply can be treated as an exogenous variable. Major changes in supply come in from 'outside', for example with new gold discoveries. David Hume in his *Essay on Money* (1752) used as his historical example the influx of gold and silver from the Spanish possessions in America between 1550 and 1600 to explain the rise in the price level in Spain and then Europe during the same period.³ There is no question in such a case that the supply of money is exogenous. Hume was aware that the initial effect of an increase in the supply of money was to stimulate industry, "it must first quicken the diligence of every individual before it increases the price of labour" (Hume, 1970). A possible effect on output as well as on prices must therefore be allowed for. But whatever its effects, there can be no doubt that the influx of silver

was in a meaningful sense the 'cause' of the increase in the total value of output.

The use of banking builds upon the base of metallic money a pyramid of money substitutes, which gradually become firmer until finally the transfer of a banker's promise to pay is regarded as closing a transaction. At the end of the nineteenth century the primary metallic money (gold) was still in general use, although a substantial superstructure of bank credit had been built upon it. The national currencies of individual countries were kept convertible, at approximately fixed parities, into the money metal. Initially, economists insisted on regarding the gold base as 'the' money, the rest being money substitutes, which enable the gold base to support a larger value of output. Looked at this way, the quantity theory does not need to be greatly changed. There is still an equilibrium path of output, determined by the supply of gold. The possibilities of fluctuation would simply be larger, as the available gold would be sometimes more fully and sometimes less fully used, but the independence of the gold base would keep the fluctuations within limited.

Nevertheless gold was already passing out of private circulation. It was becoming a specialized money, used by banks in settling accounts with one another, in particular for international transactions, but much less used outside the banking system. Gradually economists came to regard bank money as 'the' money. If the Quantity theory was to be maintained, it was to the quantity of bank money that it must apply. This step was generally taken, and by modern Monetarists is still taken. Nevertheless it is a very serious step, which makes a considerable difference to the argument (Hicks, 1977).

There is no question that when money is metallic money, its supply can be treated as an exogenous variable. Major changes in supply, at least, come in from 'outside', although under the Gold Standard 'outside' refers to the world at large, and not to individual countries. But the supply of bank money is not so clearly exogenous. It can be affected by banking policy, but with a given policy, as represented by given lending rates, the supply of bank money is largely determined by market forces. Deposits are created by the banks whenever they grant additional loans. In both retail credit and deposit markets the banks operate as price-setters and quantity-takers, and utilize wholesale markets where they are quantity setters and price takers, for any net excess demand or supply of funds (Wills, 1982). As a result the supply of bank money in nominal terms is largely determined by the demand for bank credit. It is provided by the banks to the extent the market requires, and so is *not* an exogenous variable (Kaldor, 1982).

In practice however this endogeneity was concealed, in so far as the banking system works under rules that have been imposed upon it, rules which maintain an attachment between the supply of bank money and an external base (in the Gold Standard period the supply of gold). These rules

appear completely firm, so that the supply of bank money appears to be a direct function of the Monetary base, the liabilities of the Central Bank, and so can be regarded as an exogenous variable. This interpretation is consistent with Monetarist descriptions of the working of the monetary system (Fiduciary issues, reserve requirements, deposit multipliers, etc) so that the quantity of money appears mechanically determined by the high-powered base. The significant point however is that the base is no longer rigidly tied to any external gold stock. Central banks now have the freedom to regulate the base so as to support any desired nominal volume of bank intermediation. In economies where bank money is 'the' money it is *banking policy*, rather than the *stock of money*, which becomes the exogenous variable.

This was first set out by Wicksell, in his model of a pure credit economy. All money is someone's promise to pay, and if there is no 'hard' metallic money in which payment can be made, all that can be promised is the convertibility of one promise into another promise which the creditor may at the moment prefer. If there is one agent, the reliability of whose promises was always greater than the reliability of any other's, in the case of national economies the Central Bank, whose liabilities can be made legal tender, its promises to pay become nugatory. In the international economy, where there is no legal tender, this does not arise.

Wicksell in effect postulated that there exist a group of institutions, promises to pay by each of which have maximum reliability. The promise to pay by each is a promise to exchange its promise, if required to do so, into a promise issued by another. Such a group of institutions by maintaining this relationship, may be regarded as a Banking System issuing pure credit money. Individual banks are in competition with one another. The funds which they lend are the funds which they have borrowed. In order to extend its business, it will seek to borrow more in order to have more to lend. In seeking to attract funds it must pay interest and/or provide non-pecuniary services on its deposits, the funds that it borrows. A bank's lending rate will have to exceed its borrowing rate, so as to cover its costs and make a profit, but in a competitive system this margin can be quite narrow.

One consequence is that, unlike a metallic money system, it is no longer appropriate to assume that funds are unlikely to be borrowed unless it is intended that they should be spent. For to borrow from and then re-deposit with the Banking System now involves only a small sacrifice of interest, the spread between borrowing and lending rates, and the additional liquidity gained may be worth that modest price. An even more important consequence is that, in sophisticated financial systems, borrowers enter into formal agreement with their banks for a predetermined line of credit. For a modest fee the additional liquidity gained by such unutilized credit commitments is clearly desirable.⁴

It is these two facts, more than anything else, which make the Quantity theory inapplicable to a credit money economy. A substantial part of the total quantity of bank money may in principle be idle, so that the link between the total quantity of money and the part of it which circulates is effectively snapped. This is Keynes' position, leading to a potentially greater variability in the income velocity of money. Even more important, changes in the total quantity of money are determined primarily by changes in the demand for bank credit. The quantity of bank loans is demand determined, as is the quantity of bank deposits. Through changes in interest rates in the wholesale market, bank lending and borrowing rates must adjust so that the quantity of credit demanded by bank borrowers is brought into rough equilibrium with the quantity of deposits demanded by wealth owners. As a result the quantity of money becomes endogenously determined by market forces.

In constructing a simple model of a pure credit system, it seems appropriate to neglect the margin between lending and borrowing rates, which will be relatively constant and determined by the efficiency and competitive structure of the Banking System. Wicksell let this pair of interest rates be represented by a single rate of interest, which becomes the effective monetary regulator. A rise in lending rates deters borrowing, and a rise in the deposit rates deters spending, and conversely. As a result reductions in 'the' interest rate are expansionary, increases contractionary. The fact that historical evidence reveals that rates of interest were usually high when prices were rising, and low when they were falling, simply implies that on the whole the Banking System was acting as a stabilizer. *Ceteris paribus* expansion would be greater (or contraction less) at lower rates of interest than higher. Rising prices in a boom increased the demand for loans, while falling prices in a slump diminished loan demand.⁵

During the twenty years of which Wicksell was thinking, money wages were relatively stable while productivity was rising quite rapidly, so that unit labour costs, and therefore prices, had a falling trend. But one could equally conceive of an equilibrium in which consumption prices, on the whole, were stabilized, while money wages were rising at the rate of average productivity increase.

Wicksell distinguished sharply between trend and cycle. In Keynes that distinction had disappeared. That is why in the *General theory* he threw over Wicksell's natural rate, of which in the *Treatise on Money* he had approved. He did so because he threw over Wicksell's long-term equilibrium, an equilibrium trend which left room for cyclical fluctuations about it. In Wicksell's equilibrium there is 'normal employment'. To Keynes, writing in the Great Depression, with the decade of the twenties behind him, 'normal employment' seemed uninteresting. 'Full employment', the maximum employment that can be attained by expansion of effective demand, was the only benchmark that appeared relevant. Long-term equilibrium having disappeared, the way was clear

for concentration on the economics of the short period. So Keynes' equilibrium is quite different from Wicksell's. It is just the state in which short-term demand forces have had time to work themselves out.

In Keynes' system there is a developed financial system. As a result it should be nearer the Wicksell model than the Quantity theory. Nevertheless, Keynes treats the supply of money, which is taken to be bank money, as exogenous. In order to reconcile his income-expenditure determination of the level of money income with the quantity theory explanation, Keynes was forced to stress the variability of velocity. Thus when Friedman was able to show the rough longer-run stability of velocity, irrespective of the monetary aggregate used, the Keynesian system appeared severely threatened.⁶

Unlike the *Treatise*, the *General Theory* devotes very little analysis to the Banking System ("technical monetary details fall in the background"). Keynes proceeded as if the return on deposits were zero, which led to his famous inquiry of why anyone would wish to hold such an asset? While it is true that lending rates had fallen to low levels, they were still sufficiently positive to be above the required spread of banking intermediaries, so that competition still maintained positive if low deposit rates. Yet 'the' interest rate for Keynes was the rate in long term bonds. Keynes was wrong in not following Wicksell and relating this to the return paid on deposits, especially since he did not want to rely on the effects of monopolistic market structures for his results.

One possible way out is the fact that Keynes' analysis proceeded as if the level of money wages (wage units) were given. Changes in wages are the single most important determinant of working capital credit demand. It is a fact that over the fifteen years before the *General Theory* appeared the money stock in the UK exhibited only relatively small fluctuations around a constant level (Friedman and Schwartz, 1982). However this will not do since Keynes, while holding wages constant, clearly intended his analysis to encompass changes in the level of output and employment, both of which affect the demand for bank credit, and so the money stock. Perhaps the best and simplest explanation is that he regarded his liquidity preference modification of the Quantity theory, with its variable velocity, as sufficient for his purposes, so that as a result he never succeeded in escaping entirely from the Quantity theory framework, and continued to view the money stock as exogenous. After all, velocity was in fact highly variable during the Great Depression, as Friedman himself admits, and not surprisingly this was the period which shaped Keynes' vision and from which he relied for empirical corroborations for his model.⁷

Endogenous Money Stock: Reverse Causality

As seen the traditional view of the bank money creation process relies on the bank reserves-deposits relation. Central banks are posited to be able to affect the quantity of bank deposits, and thereby the money stock, by

determining the size of the high-powered base. Since commercial banks have an incentive to economize on holdings of excess reserves, the long run ratio of bank reserves to deposits ordinarily is fairly stable.⁸ As a result it is a simple matter to determine the deposit reserve multiplier. The argument seems both plausible and convincing. Introductory students of economics are taught how central banks through open market operations affect increases or decreases in bank reserves to control the quantity of bank deposits. But its apparent simplicity should perhaps really make us suspicious. If it is so easy for central banks to control the rate of growth of monetary aggregates by controlling the supply of bank reserves, why have we recently observed the dismal failure of monetary targeting throughout the entire western world?

In fact the direction of causality implicit in both the reserves-deposit relation, and the money-income relation, is precisely the opposite of that held by the conventional view. The traditional characterization of the money supply process, which views changes in some exogenously controlled reserve base as 'causing' changes in some monetary aggregate is fundamentally incorrect. To the extent there is a stable relationship between the high-powered base and the money stock, and between the money stock and aggregate money income, the causal relationship implied is more like the *reverse* of the traditional view. The evidence suggests that the quantity of bank deposits over the longer run is determined primarily by the demand for bank credit. "In the real world banks extend credit, creating deposits in the process, and look for the reserves later." (Holmes, 1969, p.73). Whenever the increase in the money stock is a by-product of increased borrowing from the banking system, whether by the public or the private sector, the increase in the supply of money is a *consequence* of increased loan expenditure, not the *cause* of it, which the central bank can influence only indirectly by changing short-term interest rates. Both the high-powered base and the money stock are then in fact endogenous.

The evidence supporting this new view that the money stock is endogenous and not really a control variable is of at least five sorts:

- a. First, even Monetarists conceded that no limit can be set to the volume of currency put in circulation. If bank deposits are to retain their convertibility to money property, currency must be made available on demand. With regard to deposits, central bank practitioners have long attempted to dislodge the conventional notion of the deposit expansion process. In what manner do banks supply deposits? With regard to demand deposits, banks passively accept all payments paid in to checkable deposits at a fixed, zero rate of interest. So long as the central bank has a monopoly of the supply of legal tender currency, banks in turn will need to ensure the convertibility of their deposits, and therefore will need to hold currency in their tills and hold balances with the central bank. So long as there is a demand to hold the currency notes issued by the central bank, the central bank thus will be able to influence the general level of money

market interest rates. In the United Kingdom the recent joint memorandum by the Treasury and the Bank of England on Monetary Control emphasized that the Control over the money supply operates indirectly, by influencing the public's demand for money, and not by directly controlling the supply (HMSO, 1980). Because of the development of liability management by the commercial banks, it has become more difficult for the central bank to shift the relative pattern of interest rates in such a way as to make holding deposits with the banking system more or less attractive (Goodhart, 1983). In the United States Federal Reserve officials have insisted the Fed in fact follows a money market strategy. The operational directives of the Open Market Committee specify values within some range of money market variables that the manager of the account is to attempt to maintain. The amount of marginal reserves to be furnished and the money market rates sought are chosen so as to influence the direction and rate of change of a number of more remote intermediate monetary aggregates.⁹

"The idea of a regular injection of reserves . . . suffers from a naive assumption that the banking system only expands loans after the system (or market factors) have put reserves in the banking system . . . In any given statement week, the reserves required to be maintained by the banking system are predetermined by the level of deposits existing two weeks earlier. Since excess reserves in the banking system normally run at frictional levels . . . the level of total reserves in any given statement week is also pretty well determined in advance. Since banks have to meet their reserve requirements each week (after allowance for carryover privileges), and since they can do nothing within that week to affect required reserves, that total amount of reserves has to be available to the banking system. The Federal Reserve does have discretion as to how the banks can acquire this predetermined level of needed reserves. The reserves can be supplied from the combination of open market operations and the movement of other reserve factors, or they can come from member bank borrowing at the discount window . . . the suggestion that open market operations should be used in the short run to prevent a rise in total reserves through member bank borrowing is completely illogical. Within a statement week, the reserves have to be there; and, in one way or another, the Federal Reserve will have to accommodate the need for them." (Holmes, 1969, p.73; see also Burns, 1974, Volcker, 1978, and Lombra and Tarto, 1973).¹⁰

b. The second sort of evidence on the endogeneity of the high-powered base comes from formal causality tests between bank reserves and bank deposits. To satisfy Granger causality, P is said to 'cause' M if past values of P can be used to obtain more accurate forecasts of future values of M than those forecasts formed by using only past values of M (Granger, 1969). Sims developed an important procedure for testing Granger causality conditions. The method involves regressing current values of each of the variables on future, current, and past values of the other variable, after both variables have been similarly pre-filtered in order to

eliminate serial correlation in the regression residuals (Sims, 1972). Causality running from the dependent variable is indicated when the increment to R^2 from including future values of the independent variable is sufficient to reject the null hypothesis that all future coefficients are zero. The procedure is then repeated, reversing the dependent and independent variables.

Using weekly data, Feige and McGhee found that the money stock (M_1) was exogenous with respect to reserves for both the seven year period before and after the imposition of lagged reserve accounting in 1968 (Feige and McGhee, 1977). In contrast, one-way causality from money to reserves held in both periods, although the null hypothesis could only be rejected at the 10 per cent level for the earlier period. Feige and McGhee conclude that their results "raise serious doubts about the Fed's use of the traditional reserve-multiplier mechanism to control the money supply. Our findings also call into question estimated money supply equations predicted on the assumption of reserve exogeneity." (Feige and McGhee, 1977, p 549).

A recent paper, based on four different causality test procedures, similarly found that the evidence overwhelmingly supported the position that over the period 1973-81 unidirectional causality ran from each of the four different monetary aggregates to the monetary base, and from commercial bank lending to the monetary aggregates (Moore and Stuttman, 1984).¹¹

c. The third sort of evidence for the endogeneity of the high powered base is the extent to which changes in the base can be "explained" statistically by changes in economic variables, in particular by money wages. Several studies have attempted to fit central bank reaction functions related to macroeconomic policy goals such as inflation, unemployment, balance of payments, and interest rates. It has recently been shown that money wage rates are by far the most significant explanatory variable, with a highly significant positive coefficient. Lagged money wage rates alone "explain" 67 per cent of the monthly movement in the money stock, and 85 per cent of the quarterly movement (Moore, 1979).

d. The fourth kind of evidence for the endogeneity of the money stock comes from modern micro-theoretic models of the banking system. Such models view banks as a two-input, two-output firm (Wills, 1982). The two inputs are retail and wholesale deposits, the two outputs, loans and wholesale lending. Retail deposits and loans are collected and made through banks' retail branch systems. Such deposits and loans are not marketable, and banks are price-setters and quantity-takers in both deposit and loan retail markets. Wholesale deposits and loans are broadly similar securities but marketable, such as certificates of deposits (CDs), bankers' acceptances, and commercial bills. The wholesale market is the repository of or the source for any surplus or deficit of funds. Banks are

price-takers and quantity-setters in the wholesale and interbank CD markets. Both loans and deposits are thus viewed as demand-determined. This implies that the money supply should be viewed as horizontal at whatever short-term interest rate is established by the central bank.

e. The fifth type of evidence for endogeneity concerns the parallel growth behaviour of total deposits in member and non-member commercial banks in the U.S. Until 1980 non member banks were not required to hold reserves with the Federal Reserve System. They could instead count as reserve deposits held with their correspondent banks. The Fed was thus quite unable to regulate quantitatively the total reserve growth of non member banks. Nevertheless the growth rate of non member bank intermediation, rather than being indefinitely large as the conventional view would predict, was no more rapid than that of member banks, after allowing for bank size, location, and type of market.

Credit Markets and the Provision of Liquidity

There is now considerable evidence that over large sectors of the economy prices are determined as some fairly stable mark-up over historic normal unit costs (Nordhaus, 1972, Coutts *et al.*, 1978). Keynesians and others argue that the underlying basic rate of inflation is governed by the excess rate of growth of money wages over the rate of growth of average labour productivity. At the same time Monetarists have shown that over the long run, excess growth in the nominal money stock over the growth of the real productive potential of the economy will also be reflected in the rate of inflation.

These two empirical regularities logically imply that the rate of growth of the nominal money stock must be closely related statistically to the rate of growth of money wages (Moore, 1979). Monetarists argue that money stock changes are exogenously determined by the central bank, and that excess money growth 'causes' money wages to rise, like any other price. Post Keynesians argue that money wage growth is more nearly exogenous, and the central bank is viewed as forced to accommodate to money wage increases to prevent unemployment rates from rising to politically unacceptable levels. The country is then in effect on a wage standard. But as stated, until Post Keynesians are able to specify more closely the mechanism by which changes in money wages influence the money stock, like the Monetarists they are similarly open to the accusation of having a 'black box'.¹²

The process of monetary accommodation, the validation of money wage increases which the data reveal, is mistakenly viewed, by both monetarists and Post Keynesians alike, as the result of a process of *active* policy intervention by the central bank. The notion appears to be that the monetary authorities keep their eyes focused on the state of the economy in general, and on the level of unemployment in particular. Whenever unemployment rates approach politically unacceptable levels, the central bank moves to provide additional reserves to accommodate the higher

wage and price levels, so as to avoid even higher unemployment.

Such a view overlooks the fact that the central rationale for the creation of central banks, and still by far their most important function, was to provide an elastic currency supply. If financial assets are to possess liquidity, they must be capable of being exchanged quickly, easily and cheaply into cash. Specialized institutional market-makers develop, who are willing to buy and sell funds at extremely low margins, and who operate with low ratios of equity capital. To ensure the ultimate liquidity of financial assets and so the viability of the financial system, central banks stand ready to perform the role of lender of last resort. For the system as a whole, as evidenced by the experience of the 1930s, liquidity is determined by what the central bank is willing to purchase. The commercial banking system is the central institution in the liquidity-creating process. As a result by far the most basic obligation of all monetary authorities is to support, maintain and encourage orderly conditions in financial markets generally, and in the commercial banking system in particular.

In both the United States and the United Kingdom, the evidence indicates that annual changes in the volume of bank intermediation are determined primarily by the quantity of bank lending, although changes in bank security holdings and external capital flows play an important short-run role. In both countries on annual basis changes in bank loans explain more than 80 per cent of the variation in the money stock (Moore, 1979, Moore and Threadgold, 1980, Kaldor, 1982). This is hardly surprising, since bank total assets must equal bank total liabilities, and loans and deposits are by far the most important composites of these totals.

It is through the credit markets that the process of monetary accommodation to higher nominal money wages occurs. The ability of central banks to control the rate of growth of the money stock depends on their ability to control quantitatively bank lending, rather than the monetary base. Once deposits have been created by an act of lending, the central bank must somehow ensure that the required reserves are available at the settlement date. Otherwise the banks, no matter how hard they scramble for funds, could not in the aggregate meet their reserve requirements. (With lagged reserve accounting, once loans have been granted and deposits created, the monetary authorities have no choice but to provide the banks with the necessary reserves, if orderly conditions in the financial markets are to be maintained. Their only decision concerns whether funds should be provided by open market operations, or whether the banks should be driven to the discount window.)

Bank Loans to Commercial and Industrial Corporations (CIC)

The present author has previously attempted to estimate the demand for business loans, the largest of the components of bank credits, for both the UK and the US (Moore and Threadgold, 1980, Moore, 1983). Not

surprisingly, the controllability of bank lending to business corporations appears distinctly limited. Such lending is largely demand-determined. In the UK banks have a long tradition of overdraft facilities. In the US the credit crunch of 1966 spurred a widespread move towards formalizing, in a legally obligating manner, the hitherto largely informal credit-line arrangements prevailing between banks and their business customers. Corporations wanted and were willing to pay for legally-binding credit lines. Unused bank credit commitments, at about \$300 billion currently, exceed the total quantity of demand deposits included in measures of the M1 money stock (Wojnilower, 1980).

Banks are typically regarded as oligopolists in lending markets, administratively setting their interest rates in line with the prime rate, which in turn is administratively related to short-term money market rates. The quantity of bank loans is then determined largely by demand, although banks have some scope for affecting the quantity of loans granted through non-price terms, e.g., collateral requirements applied to discriminate among the fringe of unsatisfied borrowers. The amount of funds obtained through deposits, after adjustment for the reserves which must be held against them, must be reconciled with the quantity of loans granted by changing other portfolio items in the wholesale markets with the least costly mix of managed liabilities.¹³

The conventional view regards the supply of deposits as being determined by the public's demand, given short term rates of interest, prices, and income. The present view emphasizes the factors governing the supply of money rather than the demand. Banks attempt to maximize profits by satisfying the public's demand for loans with funds raised with the least costly mix of retail deposits and managed (wholesale) liabilities. When the public demands additional bank loans, it temporarily absorbs the deposits that are created in the process. As a result changes in the supply of money dominate monetary aggregates (see Judd and Scadding, 1981).

Additional bank credit is demanded to finance increases in the value of stocks and work-in-progress throughout the production-sales time interval, between the dates of payments for inputs and the dates of receipts from sales revenues.¹⁴ Increases in money wage rates, the single most important factor cost, and in raw materials costs, will thus lead to an increase in the quantity of bank credit demanded, and so to a corresponding increase in bank deposits and in the money stock. Increases in the volume of output, costs remaining unchanged, will similarly require an increase in bank loans to finance the larger value of goods in process, until larger sales receipts cover the additional working capital finance. If costs or output stabilize at some higher level, the level of bank borrowing will also stabilize at a new higher level.

The amount which working capital needs increase in response to an increase in costs or output will clearly vary among individual firms, and will depend on the length of time before output prices are raised in

response to higher historic costs. The length of the production period will ordinarily set a plausible lower limit to this time lag. Workers, other factor suppliers and even customers do provide companies with interest-free working capital finance, depending on wage payment periods and trade credit and pre-payment conventions. But this ordinarily is very short compared with the total production period, over which such working capital needs must be financed at a profit if the company is to remain in business.

Banks set the prime rate, and then attempt to meet the loan demand that results. If the resulting demand for credit exceeds the banks' available supply of funds, they must either raise the prime rate or change the degree to which they ration funds. Empirical findings strongly suggest that bank borrowing by CICs increases substantially in line on a one-for-one basis with their requirements for additional working capital (Moore and Threadgold, 1980, Moore, 1983). Several attempts were made in these studies to examine whether interest rate terms, both nominal and real, could be added to the 'menu' of explanatory variables but most of the results were unsatisfactory. When the change in real interest rates was considered, its coefficient was negative and weakly significant. The implied interest elasticity, calculated at the mean values, was less than -0.1 in both countries.

To the extent CIC borrowing is primarily for working capital purposes, this very low implied interest elasticity is not surprising.¹⁵ Taken at face value the results imply that the ability of the monetary authorities to restrain the growth of company borrowing indirectly, by varying short term interest rates, is severely limited.¹⁶ In the short run loan demand appears largely insensitive to interest cost variations.¹⁷

The attempt to catch changes in credit rationing effects was modelled in the above mentioned studies by dummy variables to capture any effects of 'credit crunch' periods. Several such dummies had negative coefficients as expected, but none even approached significance. To the extent credit rationing was directed by banks primarily at loans to persons, real estate and other financial companies, these results for CICs are perhaps not too unexpected.

Summary and Conclusions

In conclusion for both the US and the UK it is possible to identify a single equation for bank business lending that has a relatively high degree of explanatory power. The implicit assumption of the analysis was that banks set their lending rates and attempt to meet the demand for loans that results. There was no evidence that changes in the degree to which banks ration credit are important. The monetary authorities' ability to control the expansion of bank credit is primarily through their ability to influence the levels of short term interest rates. The low interest elasticity of real lending rates, and the failure of nominal rates to be significant and

negatively signed, suggests that the authorities' power to control the volume of credit expansion through this means is slight, particularly over the short run.

The historical evidence suggests that in both the United States and the United Kingdom the ability of the monetary authorities to control the rate of bank credit expansion is severely limited. The growth of money wage rates, both as a component of companies' demand for working capital finance, and as determinants of disposable personal income, appears to play the most important role in determining the demand for bank credit. Since central banks, consistent with their paramount supportive role to the financial system, operate to allow the money stock to accommodate to increases in the demand for bank credit, monetary aggregates may properly be considered to move endogenously. Monetarists are not justified in regarding the money stock as an exogenous control variable, simply because it appears 'in principle' under the control of the monetary authorities. The economics profession in general must come round to the view that the supply of money is horizontal at every going short-term interest rate. The quantity of money is always demand-determined, so that there is never an excess supply of nominal money balances. At the same time bank reserves cannot be quantitatively constrained if deposits are to retain their liquidity. Central banks can, within some limits set by the level of foreign interest rates and the degree of international capital mobility, in general only determine the short term interest rate at which they will be willing to supply legal tender liquidity. But the money stock itself is not a control variable.

It might be argued that it would *theoretically* be possible for central bankers to refuse to accommodate the expansionary upwards pressure on the money stock caused by rapid credit and wage growth. Monetarists might well accept at least the first three of the above arguments for the endogeneity of money growth, but argue that it was due to an inappropriate institutional structure, and blame central banks for accepting that structure. Given the interest insensitivity of bank borrowing in the short run, it is hardly controversial that tighter control and a more stable growth of the money stock would involve much greater interest rate instability. Central bankers' over-riding concern for financial stability follows ultimately from their commitment to preserve the liquidity of financial assets and the solvency of the financial system. With time the financial system could undoubtedly adjust to accommodate much greater variability in interest rates, for example by the use of variable rate instruments. But so long as long term financial asset prices fluctuate inversely with interest rates, the latter cannot be allowed to vary *pari passu* with the wide variations in the marginal efficiency of investment over the business cycle, if financial stability is to be preserved.

On the basis of the historical record for both the US and the UK the money stock varies endogenously, and the single most important determinant appears to be the behaviour of money wages. As result, it is extremely

difficult for central banks to restrict the rate of monetary growth when money wages are rising rapidly. How then is the inexorable upward pressure of money wages on prices to be contained? Apart from engineering permanent slump conditions, the only feasible long run solution would appear to be to devise a national policy for the determination of money wages (Eichner, 1976, Weintraub, 1978). Some institutional framework must be created in which trade unions, employers and the government agree on a target aggregate rate of growth of money wages in the light of past and expected future productivity trends. But that is another story.

FOOTNOTES

- * Thanks are due to C. A. E. Goodhart of the Bank of England for comments on an early draft, and to Paul Davidson for many insights.
1. The usefulness of the quantity theory as a policy guide stands or falls on the proposition that the demand for money, or its reciprocal, the income velocity of money, is stable and largely invariant to changes in the quantity of money. For if this were not so, and velocity were purely a statistical residual relationship as the Radcliffe Committee suggested, control over the quantity of money would have no causal influence on the level of money expenditures (Kaldor, 1982).
 2. In the case of the United Kingdom it is conceded that the working arrangements with the discount houses prevent the Bank of England from exercising rigid monetary base control. But these institutional arrangements could be changed, and alternative procedures assuring reasonable control of the money stock envisaged (HMSO, 1980).
 3. The price level in Spain approximately doubled between 1550 and 1600 (Hamilton, 1934).
 4. In both the United States and the United Kingdom total bank debt in existence is characteristically only from one half to two thirds of the total amount of lines of credit and overdraft facilities previously formally committed. (Federal Reserve Board (1980), HMSO (1980).
 5. Wicksell himself was concerned to explain the long run fall in prices during the twenty years preceding his writing of *Interest and Prices* (1898). His answer was to emphasize the importance of what he termed the natural rate of interest, the real return on investment, i.e. the productivity, in terms of real goods, of the inputs on which the borrowed money is to be spent. Wicksell believed that there had been a fall in the natural rate over this period, and the banking system had failed to allow interest rates to fall sufficiently. Wicksell argued that when the actual (or market) rate of interest is above the natural rate, the growth of credit, money and prices will fall; when it is below, the growth of credit, money and prices will rise. So long as the discrepancy persists, the fall or rise will continue cumulatively (Wicksell, 1907).
Nevertheless, since the natural rate is a real rate, and the market rate is a money rate, as soon as one distinguishes between current and expectations of future prices, it is apparent that there is a whole set of natural rates for different equilibria rising or falling price trends. If all prices are equally flexible, there is no way of distinguishing among these equilibria. Myrdall argued that in the real world, wages are less flexible than other prices, and

one equilibrium might be regarded as better than another if it put less strain on the less flexible prices, enabling the economy to function with smaller excesses of supply or demand. In that view, he favoured an equilibrium in which money wages moved little, so that with increasing productivity, consumer prices, supposed to be more flexible, fell. This particular Myrdall equilibrium, out of the many Wicksellian equilibria, has to be selected on non-monetary criteria, depending on the institutional structure of the economy. Depending on circumstances, prices (as represented by some particular price index) may be constant, falling, or rising (Myrdall, 1933).

6. Friedman and Schwartz have recently argued that the interwar period for the US, which broadly supports the Keynesian vision, was anomalous in the sense that for the remainder of more than a century of experience, for both the US and the UK, the data reveal a long run stability of velocity more supportive of the Quantity theory (Friedman and Schwartz, 1982).
7. Interestingly enough, in the *Treatise* Keynes recognized clearly that the nominal money stock responded endogenously to the increased working capital demands associated with an increase in investment spending and an expansion of output. In his stylized model, 'An Exercise in the Pure Theory of the Credit Cycle', he assumed explicitly that "the banks create just enough additional money for the industrial circulation, after allowing for any fluctuations in the amount of the financial circulation to allow the absorption of the unemployed factors of production into employment at a steady rate. . . . This amounts to the banks supplying the entrepreneurs with whatever they require, over and above their profits, to pay wages on the gradually increasing scale which is assumed and to increase their business deposits." (*Treatise*, 1930 p.275). Hicks has attempted to salvage Keynes' assumption of an exogenous money stock by distinguishing a 'core' and 'mantle' set of institutions as what Keynes must have intended. His analysis however is distinctly unpersuasive. See Hicks (1977) pp.75-80.
8. An important exception was the high level of excess reserves held by commercial banks in the US during the 1930s. See Friedman and Schwartz (1963).
9. Central bankers insist that in the short run money stock creation is a joint result of a complex interaction among households, business corporations, financial institutions, the Treasury and the Central Bank. In addition they emphasize that most of the reported short-run movements in monetary aggregates are primarily the result of statistical 'noise'—random forces and estimating errors in the data. "It is clear that, as a matter of fact, the Federal Reserve does not attempt to increase the money supply by a given amount in any period by furnishing a fixed amount of reserves on the assumption that they would be multiplied to result in a given increase in money." (Maisel, 1969, p.161). If the Fed never regards itself as in practice determining changes in monetary aggregates over the short run, it is hard to see how it can be viewed as determining changes over longer runs, which are simply aggregations of shorter runs.
10. Since October 1979 the Federal Reserve has professed that its actions are directed to achieving a desired rate of growth of specified monetary aggregates, and that it is no longer following a money market strategy. Under the old approach the Trading Desk in New York operated day-to-day and week-to-week to hold the Federal funds rate within a narrow band. The funds rate target and changes in this objective were determined with a view to inducing the desired money growth rates. Since October 1979 the Desk's week-to-week objective has been set in terms of reserves. Under the new approach the Desk aims to supply reserves at a level consistent with the

money growth objectives set by the *Federal Open Market Committee* (FOMC).

Nevertheless the fact that since that date actual growth rates of the high powered base and monetary aggregates have been extremely unstable, and have been clearly *positively* correlated with fluctuations in short term interest rates, suggest that current practices of the Federal Reserve continue to involve a blend of money market considerations. The Fed has acknowledged that the FOMC continues to set broad ranges of tolerance for money market interest rates, though it argues these ranges no longer serve as rigid constraints (Volker, 1978, Judd and Scadding, 1981).

11. The only exception was a bidirectional or feedback relationship found to exist between the monetary base and the M_2 aggregate (Moore and Stuttmann, 1982 pp.13-17).
12. The Post Keynesian view that changes in the money stock are determined fundamentally by the rate of growth of money wages does explain why in virtually all countries the rate of money growth has been so much higher during the 1970s than during the 1960s. If money growth were truly exogenous, this growth somehow would have to be attributed to massive and coincident errors by different monetary authorities. Nevertheless a degree of socio-economic reasoning is necessary to explain why wages rose simultaneously in the 1970's in different countries with differing labour markets.
13. Historically, imbalances between changes in loans and deposits were financed by changes in marketable securities, primarily central government debt. Since 1962 the development of an active market in certificates of deposits (CDs) has enabled banks to place large quantities of these liabilities at their own initiative. This liability management has enabled banks to run down their precautionary reserves, and to rely on 'liability side liquidity' to meet demands for funds. As a result they have been better able to accommodate to changes in the demand for loans (Judd and Scadding, 1981).
14. Production takes time, and time must be taken seriously. In modern economies production costs are normally incurred and paid prior to the receipt of sales proceeds. Such costs represent a working capital investment by the firm, for which it must necessarily obtain finance. Over wide sectors of the economy prices are administered as some fairly stable markup over historic normal unit costs (Coutts *et al* 1978). Whenever wage or raw materials price increases raise current production costs, unchanged production flows will require additional working capital finance. In the absence of instantaneous replacement cost pricing, firms must finance their increased working capital needs by increasing their borrowings from their banks, or by running down their liquid assets.
Working capital needs may also be met by increases in non-bank borrowing or long-term debt issues, raising additional equity finance internally or externally, or realizing non-liquid assets. All of these sources of funds take longer to arrange. In the UK study alternative definitions of the dependent variable were tried in an attempt to specify the extent to which companies would increase bank loans or draw down their bank deposits or other liquid assets to meet increases in their working capital requirements. Somewhat surprisingly gross bank borrowing was more clearly determined by changes in working capital needs than either of the net definitions. See Moore and Threadgold (1980) pp.24-26.
15. It is generally believed that CICs also borrow from banks to finance fixed investment expenditures as working capital needs, at least temporarily until

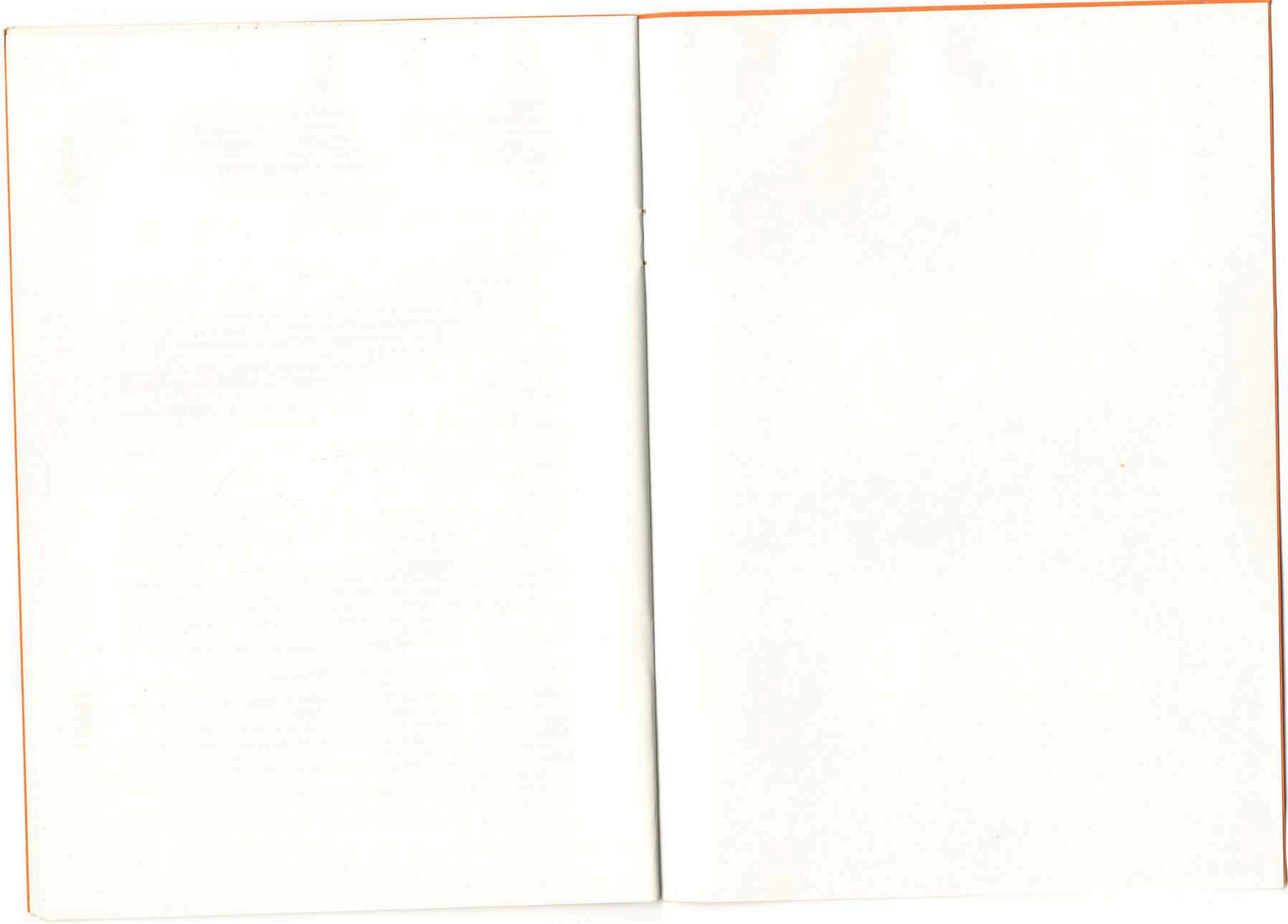
they have arranged sufficient longer term financing. The inclusion of a term representing changes in current price corporate fixed investment (predominantly CICs) proved insignificant and wrong-signed. Upon reflection it was concluded that this was not surprising, since all working capital demand, in both capital goods and consumer goods industries, had already been included in the equation.

16. It is however probably that variations in the cost of borrowing may have strong effects which could not be caught by a simple single-equation reduced form approach. High interest costs may induce companies to lower their demand for working capital, by cutting back directly on their wage and materials bills, thus reducing their volume of employment, production, and inventories of goods in process. Such effects could only be caught by a simultaneous equation system in which interest rates were allowed to affect the various uses for working capital finance.
17. The failure to find larger and more significant interest rate effects may possibly be due to the unwillingness of these Central Banks to permit wider short-run fluctuations in the level of interest rates over much of the period. Positive estimated coefficients on nominal interest rates alternatively may be due to positive expectations effects, in which current rises in rates lead to expectations of still further future increases, and so induce greater current demand.

BIBLIOGRAPHY

- Burns, A., (1974), "Statement before the Committee on Banking and Currency, House of Representatives," 30 July 1974 in *Federal Reserve Bulletin* 60 (August), pp.554-560.
- Cagan, P. (1965), *Determinants and Effects of Changes in the Stock of Money: 1875-1960*, (National Bureau of Economic Research: New York).
- Coutts, K., Godley, W., and Nordhaus, W., (1978), *Industrial Pricing in the United Kingdom* (Cambridge University Press: Cambridge).
- Eichner, A. S., (1976), *The Megacorp and Oligopoly: Micro Foundations of Macro Dynamics*, (Cambridge University Press: Cambridge).
- Federal Reserve Board, (1980), "Loan Commitments at Selected Large Commercial Banks" *Statistical Release*, G21 (September).
- Feige, E. and McGhee, R., (1977) "Money Supply control and Lagged Reserve Accounting", *Journal of Money, Credit and Banking*, Vol LX, No 1 (November), pp.536-551.
- Friedman, M. and Meiselman, D., (1963), "The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States 1897-1958" in Commission on Money and Credit, *Stabilization Policies*, Research Study No. 2, (Prentice-Hall: Englewood Cliffs, N.J.), pp.165-269.
- Friedman, M. and Schwartz, A., (1963), *A Monetary History of the United States 1867-1960* (Princeton University Press: Princeton, N.J.).
- Friedman, M. and Schwartz, A. (1982), *Monetary Trends in the United States and the United Kingdom*, NBER (Chicago University Press: Chicago).
- Goodhart, C. A. E., (1983), "Structural Changes in the Banking System and the Determination of the Stock of Money", (Unpublished).

- Granger, C., (1969), "Investigating Causal Relations by Econometric Models and Cross-Spectral Methods", *Econometrica* 37, No 3 (July), pp.424-38.
- Hamilton, E., (1934), *American Treasure and the Price Revolution in Spain*, (Princeton University Press: Princeton, N.J.).
- Hicks, Sir John, (1967), *Critical Essays in Monetary Theory*, (Oxford University Press: Oxford).
- Hicks, Sir John, (1977), *Economic Perspectives: Further Essays on Money and Growth* (Oxford University Press: Oxford).
- Holmes, A., (1969), "Operational Constraints on the Stabilization of Money Supply Growth", in *Controlling Monetary Aggregates*, Federal Reserve Bank of Boston, (June), pp.73-4.
- Hume, D., (1970), *Writings on Economics*, E. Rotwein (ed.), (Madison).
- Judd, J. and Scadding, J., (1981), "Liquidity Management, Bank Loans, and Deposit Market Disequilibrium", *Economic Review*, Federal Reserve Bank of San Francisco (Summer), pp.21-44.
- Kaldor, N., (1982), *The Scourge of Monetarism* (Oxford University Press: Oxford).
- Keynes, J. M., (1930), *A Treatise on Money*, (Macmillan: London).
- Laidler, D., (1981), "Monetarism: An Interpretation and An Appraisal", *Economic Journal* 91 (March), pp.1-28.
- Lombra, R. and Torto, R., (1973), "Federal Reserve Defensive Behaviour and the Reverse Causation Argument", *Southern Economic Press*, Vol 10 (July), pp.47-55.
- Maisel, S., (1969), "Controlling Monetary Aggregates", in *Controlling Monetary Aggregates*, Federal Reserve Bank of Boston, (June), pp.153-161.
- HMSO, (1980), *Monetary Control*.
- Moore, B. J., (1979), "The Endogenous Money Stock", *Journal of Post Keynesian Economics*, Vol II, No 1 (Fall), pp.49-70.
- Moore, B. J. and Threadgold, A., (1980), *Bank Lending and the Money Supply*, Bank of England Discussion Paper No 10 (July).
- Moore, B. J. and Stuttman, S., (1984), "A Causality Analysis of the Determinants of Money Growth", *British Review of Economic Issues*, (Spring)(Forthcoming).
- Moore, B. J., (1983), "Unpacking the Post Keynesian Black Box: Bank Lending and the Money Supply" *Journal of Post Keynesian Economics*, Vol. V, No. 4 (Summer) pp. 537-56.
- Myrdall, G., (1933), *Monetary Equilibrium*, (English translation 1939).
- Nordhaus, W., (1972) "Recent Developments in Price Dynamics", in O. Eckstein (ed.), *The Econometrics of Price Determination*, (Board of Governors of the Federal Reserve System: Washington DC), pp.16-49.
- Sims, C., (1972), "Money, Income and Causality", *American Economic Review* 62 (September), pp.570-552.
- Radcliffe Report, (1959), *Committee on the Working of the Monetary System* HMSO, (August).
- Tobin, J., (1981), "The Monetarist Counter-Revolution Today — An Appraisal" *Economic Journal* 91 (March), pp.29-42.
- Volcker, P., (1978), "The Role of Monetary Targets in an Age of Inflation", *Journal of Monetary Economics*, (No. 4), pp.329-339.
- Weintraub, S. (1978) *Keynes, Keynesians and Monetarists* (Pennsylvania).
- Wicksell, K., (1907), "The Influence of the Rate of Interest on Prices", *Economic Journal* 17 (June), pp.213-220.
- Wills, H. R., (1982), "The Simple Economics of Bank Regulation", *Economica* 49 (August), pp.249-259.
- Wojnilower, A., (1980), "The Central Role of Credit



THAMES PAPERS IN POLITICAL ECONOMY

A LIST OF PAST PAPERS

- History versus Equilibrium, JOAN ROBINSON (Autumn 1974)
- An Essay on the Political Economy of Chinese Development, AJIT SINGH (Spring 1975)
- Government Activity and Private Profits, THANOS SKOURAS (Summer 1975)
- Capital Theory : Much Ado About Something, G. C. HARCOURT (Autumn 1975)
- Varieties of Keynesianism, ALAN CODDINGTON (Spring 1976)
- Six Myths of British Oil Policies, PETER NORE (Summer 1976)
- Economic Theory and Expanding State Activity, GEORGE HADJIMATHEOU
(Autumn 1976)
- Empiricist Methodology and the Development of Economic Thought,
FRANCIS GREEN (Spring 1977)
- Political Concomitants of Rapid Industrialization, THANOS SKOURAS (Summer 1977)
- Crisis Theories in Economic Thought, ANWAR SHAIKH (Autumn 1977)
- Keynesians, Monetarists and Keynes: the End of the Debate – or a Beginning?,
VICTORIA CHICK (Spring 1978)
- Underdevelopment and Marxism: from Marx to the theories of
Imperialism and Dependency, GABRIEL PALMA (Summer 1978)
- The Financial Instability Hypothesis: A Restatement, HYMAN P. MINSKY (Autumn 1978)
- Revisionism Revisited: An Essay on British Evolutionary Socialism, ALAN FOSTER
(Spring 1979)
- Theories of Value, Output and Employment, JOHN EATWELL (Summer 1979)
- When is a Problem of Economic Policy Solvable?, MAURICE PESTON (Autumn 1979)
- Productive and Unproductive Labour: Uses and Limitations of the Concept,
CIARAN DRIVER (Spring 1980)
- Against Demand and Supply: Two Essays, A. FRERIS and T. SKOURAS (Summer 1980)
- Macroeconomic Policies of the 1974–79 Labour Government,
P. ARESTIS and G. HADJIMATHEOU (Autumn 1980)
- The Formation of Economic Policy : A Question for Economists?,
YIANNIS KITROMILIDES (Spring 1981)
- Monetarist Policies and Neo-Keynesian Alternatives,
DAVID CURRIE (Summer 1981)
- Demand, Real Wages and Economic Growth, BOB ROWTHORN (Autumn 1981)
- Is There any Crowding Out of Private Expenditure by Fiscal Actions?
PHILIP ARESTIS (Spring 1982)
- Post Keynesianism: Quite Wrong and/or Nothing New?
G.C. HARCOURT (Summer 1982)
- Towards a Post-Kaleckian Macroeconomics,
MALCOLM SAWYER (Autumn 1982)
- The Post-Keynesian Paradigm and Macrodynamical Modelling,
ALFRED S. EICHNER (Spring 1983)
- An Essay on Keynes and General Equilibrium Theory
PETER SKOTT (Summer 1983)
- The Rise of Monetarism as a Social Doctrine
AMIT BHADURI and JOSEF STEINDL (Autumn 1983)