1β Monetary Targets and Economic Policy

Control of Monetary Aggregates

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to take up advances he does not want. It is therefore only excess demand that we are concerned with. There are very few models for the UK which allow the testing of credit effects correctly, in this way, because bank advances are usually not forecast in a way which will allow the excess demand to be identified. Certainly, the LBS and NIESR models are misspecified in this respect. Mr Spencer's bank advance equations do, however, allow the measurement of the excess demand and the effect of this may be tested empirically against consumption. Bean [6] attempted precisely this but found no significant correlation. This negative result may, though, be due to the difficulties of measuring this excess demand and the final result is still in doubt. It does seem clear though, that the effect of bank credit on consumption must be weak, if present at all. By contrast, the effect of consumer credit on consumption is well documented for the UK (see Ball and Drake [4] or Allard [1]). A change in controls has a very rapid effect on purchases of consumer durables perhaps measuring up to ¾% of GDP. This effect wears away over time. In spite of Dow's plausible theoretical reasons for why the effects might spread to non-durable purchases [12], no empirical evidence of such effects has been obtained.

Investment in housing by persons is a much smaller component of demand, barely a fortieth of consumers' expenditure. Qualitatively, the determinants of housing investment should be the same as of any personal expenditure. Two features, however, make this expenditure special; namely, that for most individuals a house is the largest purchase they are every likely to make, necessitating special financial arrangements and that important special financing agencies deal exclusively with this financing. As a result, the excess demand for housing (Building Society) credit is almost certain to dominate other determinants, including wealth and interest rates. Unfortunately, the very fact that housing finance has been chronically supply-constrained makes it difficult to determine the demand curve and hence to measure excess demand. In time, the effects of the other determinants are obscured. Thus, although many people (including myself) are prepared to assert that credit is a most important factor in this market, no models

are available which give satisfactory quantitative linkage between housing expenditure and credit.

Turning to the corporate contribution to aggregate demand, only two of the three monetary factors we considered for persons can be relevant. Firms are merely collections of individuals associated in a particular legal framework. By definition, firms' balance sheets balance - assets exactly equal liabilities - and hence they are not ultimate holders of wealth. Since their wealth is always zero, wealth effects cannot operate on corporate expenditures. On the other hand, both credit and interest rates may be relevant. Traditionally, it has been the real rate of interest which has been felt to be relevant to investment, Keynes himself taking this view. Modern analysis has tended to follow Jorgenson's model [26] and its extensions where the real rate enters as the major determinant of the cost of capital. These models have proved quite successful in the United States but less so in the UK. (Boatwright and Eaton [7] published an apparently well-fitting equation for manufacturing investment based on an Eisner/Nadiri model but Treasury work was never able to replicate these results.) Flemming, [14], however, has suggested that nominal interest rates may be an important determinant of investment because of the "front-loading" problems associated with high nominal interest rates and conventional industrial financial borrowing instruments. The evidence, particularly over the last few years, is consistent with a substantial effect of this kind. With regard to stockbuilding, it has not been easy to find either real or nominal interest rate effects. Trivedi, [49], reported weak effects from real rates for the UK up to 1970 but the latest empirical work, over a longer time period, has failed to detect even weak effects even after considerable searching of the data. Other determinants, particularly expected sales, appear to swamp any interest rate effects which might be present.

As with personal expenditure, credit can only affect corporate expenditure to the extent that there is excess demand. The financial institutions themselves have frequently asserted that there are no important lending constraints to viable industrial

concerns. If this is so, then credit cannot be a primary determinant of expenditure by firms. Mr Spencer's failure to find any period when industrial and commercial firms were not on their demand schedule adds credence to this assertion. Indeed, this is not entirely a surprising conclusion; apart from the fact that official policy has usually been to give preference to industrial borrowers, it is normally in financial institutions' own interests to restrict credit just to personal customers rather than corporate ones, since the transaction costs and default risks are typically higher in the former case. These considerations, then, suggest that credit has not been an important factor in determining either investment or stockbuilding.

So far, we have only considered aggregate demand. Evidence bearing on aggregate supply is sparse because, until recently, few economists have concerned themselves with aggregate supply at all. The analysis of the preceding section suggested two main impact points of monetary variables here: (i) the possibility that money balances are themselves a factor of production; (ii) the impact of monetary policy on output price expectations. Friedman's original illustration of his point that real balances are a factor of production was to imagine how much less efficiently transactions - the mainspring of a market economy - could be carried out, if no money existed at all. While we might readily agree that production would fall in these circumstances, this is scarcely to the point if we are interested in the effects of a feasible change in real balances. To date, the only empirical study that I am aware of is by Sinai and Stokes [46] who reported that real money balances, on the US M1, definition were an important factor in the production function for the United States. This result was criticized by a number of economists in a subsequent Review of Economics and Statistics symposium [46] but, on my reading of the debate at least, their main conclusions survived. Rudimentary evidence for the UK, however, comes from the construction industry. The private housebuilding industry has an unusually high proportion of small firms with limited financial resources. It seems fairly clear that credit restrictions have affected the supply of private housing starts by reducing the transactions balances of some of these small

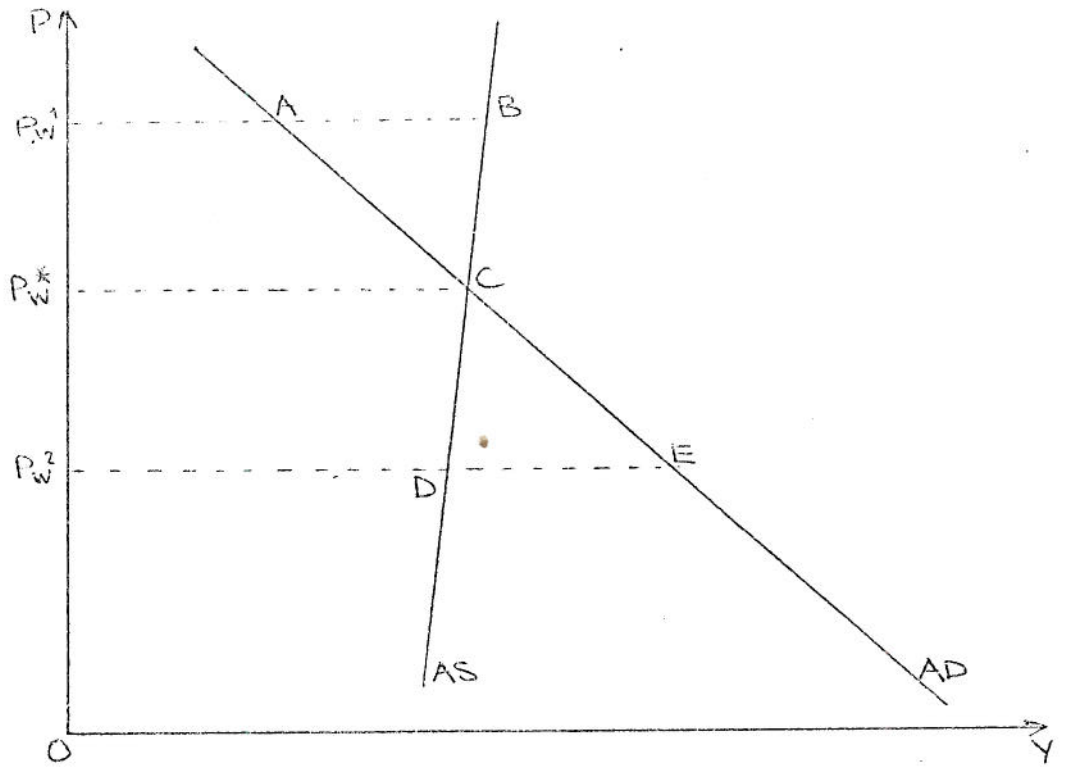
firms below the level which they require to remain in business. (See Whitehead [51].) If this experience has also occurred in other parts of the economy, then real money balances could be important factors of production in the UK, as well as in the United States. Changes in production induced by credit policy could be important at the margin and the inference for policy would seem to be that the direction of credit policy is at least as important as the strength with which it is applied.

Finally, in this section, we have to consider the formation of producers' output price expectations. In the analysis of the previous section, this process is crucial, since the divergence between actual and expected prices determines both the future output and price path for the economy. We can deal with the empirical evidence on this topic very quickly, however: (a) to my knowledge there are no satisfactory studies for the UK: (b) the analysis, in any case, requires some modification with regard to the price level when we consider an open small economy like the United Kingdom rather than a closed one. It is therefore now convenient to extend the analysis to allow for this fact.

D. The Transmission Mechanism: External Considerations

In the analysis so far, the aggregate price level adjusts to an equilibrium where aggregate demand and supply equate. In a small open economy, this is no longer the case. Rather the price is given by the level of international prices which in turn are only negligibly influenced by demand and supply consideration of the small economy itself. This "law of one price" is an assertion about the way the world functions and, as such, requires empirical justification. We may then find instead that either the world does not behave like this at all or that the "law" applies only after such a long period that it is virtually irrelevent for all practical considerations. On the other hand, Ball and Burns [5] found evidence that the law of one price did approximate to reality for the UK virtually immediately and there therefore seems justification for taking it as a working assumption.

Diagrammatically, the situation is as here:-



(Note that the "run" for aggregate supply is not specified in this diagram.) If world prices are initially at P_w^1 then aggregate supply will exceed aggregate demand and there will be a current account surplus of AB. If, rather, world prices were at P_w^2, then demand would exceed supply and the current account deficit would be DE. In either case, if there were no banking system, the monetary flows associated with these surpluses and deficits would would tend to shift AD and AS in such a way as to intersect at the prevailing price level. An alternative mechanism would be for the exchange rate to adjust so that world prices in domestic terms were moved to the supply/demand intersection at P_w^*. Before proceeding, note that the character of the aggregate supply and demand curves has not changed from the previous model so that all of the empirical evidence reviewed on their determination still holds. The only substantial change is that the collection of these factors now determines the current account, not the price level.

Two factors show the simplicity of this analysis: first, the capital account and second, the existence of a sophisticated

financial system, capable of manufacturing financial assets and liabilities independently of any physical transactions in the economy.* Separate analyses apply in the paradigm fixed and floating exchange rate regimes. Actual experience is likely to contain elements of both.

1. Fixed Exchange Rates. The first point to note about this regime is that the private sector of the economy, having access to the Exchange Equalisation Account, not only controls real money balances but can also control its holdings of nominal money. Hence, so far as the government is concerned, monetary policy is not possible but it still may have credit policy. (This is the counterpart to our argument in section C above that monetary aggregates, rather than credit, could not have affected consumption up to 1973.) Domestic credit C, therefore becomes central to the analysis; it may be divided into that proportion going to the government, Cg, and that part going to the private sector, Cp:-

$$C = Cg + Cp \qquad (i)$$

Consider now the effect of changes in the price level, $\pi = \dot{P}/P$. To simplify, we suppose that the ultrarationality postulate holds so that government debt is not regarded as a private sector asset a and money itself is the only money-fixed asset. Assuming that the private section portfolio were initially in balance, the only effect of the inflation will be to generate a replacement demand for real money balances equal to the proportionate inflation rate time the original level of real money balances outstanding. Given the definition of the current account, the real deficit, D/P, may be expressed as

$$\frac{D}{P} = Y^e - \pi m - y \qquad (ii)$$

*Because the analysis is now more complicated, the rest of it is in impact terms only. I do not believe that any important policy prescriptions are lost by ignoring the subsequent dynamic adjustment (not for monetary policy, at least) while the algebra is very much simplified.

where

y^e = private sector real expenditures on goods and services

y = real output

Private expenditure is a function of private sector income (including the real volume of credit created by the government), q, and real interest rates, r.

$$y^e = f(q,r) \qquad \text{(iii)}$$

$$\therefore \quad \frac{D}{P} = f(q,r) - \pi m - y \qquad \text{(iv)}$$

Thus, the current deficit is equal to private sector expenditure less that spent on acquiring new money balances less domestic output. (For simplicity, we take output to be independent of real money balances.) Suppose now that government policy changes so that it requires more credit. Then

$$\frac{\Delta D}{P} = f_q\left(\frac{\Delta C_g}{P}\right) + f_r \Delta r - m\Delta\pi \qquad \text{(v)}$$

At this point, we need to determine the rate of inflation π. We use the model of Cagan [9] and Mundell [37].

$$\pi = a\lambda + (1-a)\pi^* + \ldots \qquad \text{(vi)}$$

where

$\lambda = \dot{M}/M$ is the (endogenous) rate of money creation

π^* = inflationary expectations

Instantaneously, π^* may be taken as fixed. Thus

$$\Delta\pi = a\Delta\lambda \qquad \text{(vii)}$$

At the same time, by virtue of the DCE definition (and ignoring non-deposit liabilities)

$$M = E R + C \qquad \text{(viii)}$$

where

E = the exchange rate

R = the level of reserves in international currency

C = domestic credit outstanding

$$\therefore \quad \lambda_m = \frac{(C)}{(P)}\lambda_c + \frac{(E)}{(P)}\dot{R} \qquad \text{(ix)}$$

where

λ_c = $\dot{C}/C$ is the proportionate rate of credit expansion

Substituting (ix), into (vii) and then into (v), we obtain the expression for the current account of the balance of payments as

$$\frac{\Delta D}{P} = f_q \frac{\Delta C_q}{P} + f_r \Delta r - \alpha\left[\frac{\Delta \dot{C}}{P} + \frac{E}{P}\Delta \dot{R}\right] \qquad \text{(x)}$$

We now need to look at the capital account. Just as the current account may be considered as the excess of domestic demand for goods over domestic supply, so the capital account, K, is characterized as the excess of domestic demand for financial assets (K^D) over domestic creation of these assets (K^S).

$$K = K^D - K^S \qquad \text{(xi)}$$

or, in difference terms

$$\Delta K = \dot{K}^D - \dot{K}^S \qquad \text{(xia)}$$

Now instantaneously we can take income as fixed. Given the income-expenditure relationship for the private sector, (iii), instantaneous change in the real demand for financial assets is a function of the real interest rate r. (Note that π^* is fixed so that the nominal perceived interest rate is just r plus a constant.) Thus from (iii)

$$\frac{\dot{K}^D}{P} = f_r \Delta r \qquad \text{(xii)}$$

On the supply side, by definition

$$\dot{K}^s = \dot{C}p \qquad \text{(xiii)}$$

Substituting (xii) and (xiii) into (xia), we obtain the capital account expression

$$\Delta K = Pf_r \Delta r - \Delta\dot{C}p \qquad \text{(xiv)}$$

Finally, we can obtain the balance of payments as a whole as

$$ER \equiv K - D \qquad \text{(xv)}$$

Substituting the current account expression (x) and the capital account expression (xiv) into (xv) and manipulating:

$$E(\Delta\dot{R}) = - (\Delta\dot{C}) \left[\frac{(1-\gamma) + \gamma fq - a}{1-a}\right] \qquad \text{(xiv)}$$

where

$$\gamma = \Delta\dot{C}g/\Delta\dot{C}$$

γ is interpreted as the proportion of new credit extended which is advanced to the government.

It is possible to break down the balance of payments expression (xvi) into three identifiable factors:

(i) $(1-\gamma)(\Delta\dot{C})$ represents the worsening of the capital account due to new credit displacing existing credit advanced to the non-bank private sector;

(ii) $\gamma fq\ (\Delta\dot{C})$ represents the deterioration of the current account due to the increased expenditure occasioned by the new credit;

(iii)$(a\,\Delta\dot{C})$ represents the improvement on both current and capital accounts caused by the fact that the new credit has pushed up the instantaneous rate of inflation. In turn, this leads to a reduction in real money balances causing a reduction in domestic expenditure on goods and services and an increased replacement demand for financial assets.

This analysis has two important implications for policy. First, the balance of payments effects of credit policy in a fixed rate regime are substantial and immediate. While the income/expenditure effect may take time to emerge in full, the displacement effect on the capital account is likely to be immediate. Secondly, and perhaps more interestingly, the effect depends upon who receives the new credit. There are two limiting cases:

(a) suppose the government receives all of the new credit so that $\gamma = 1$. From (xiv), the effect on the balance of payments of the new credit is given by

$$E(\Delta\dot{R}) = -\Delta\dot{C}g\left(\frac{f_q - a}{1-a}\right)$$

(b) suppose, instead, that all of the new credit is extended to the private sector. Here, $\gamma = 0$ and the balance of payments effect is given as

$$E(\Delta\dot{R}) = -\Delta\dot{C}p$$

In general f_q will not be equal to unity - it is the impact marginal propensity to spend out of income - and the two expressions will be different.

2. Floating Exchange Rates. In the case of a "clean" float, monetary policy is restored as an option to the authorities. Indeed, overall, credit policy and monetary policy now became identical since no balance of payments flows can drive a wedge between them. The main change required to the fixed rate model is to take cognizance of the fact that the nominal interest rate, i, is now linked to the international nominal interest rate, i*. Assuming that the interest rate parity thereon holds

$$i = i^* + (\dot{E}/E) \qquad \text{(xvii)}$$

Since the interest rate i is affected by the exchange rate, it is no longer sufficient to assume that the demand for real money balances is in stock equilibrium since the interest rate itself

determines, in part, the desired stock. Thus private sector expenditure on new money balances is now given by

$$\Delta(\dot{M})^{D}/P = M\Delta\pi - \alpha\beta\Delta i \qquad \alpha,\beta \geq 0 \qquad \text{(xviii)}$$

where

α = the stock adjustment coefficient of money to interest rate changes

β = the semi-elasticity of real money balances with respect to the rate of interest (ie d log $(M^{D}/P)/di$)

Noting that $\dot{R}$ must be equal to zero in the floating case and taking account of (xviii), the current deficit is now given by

$$\frac{\Delta D}{P} = (f_{q}\gamma - a)\left(\frac{\Delta\dot{C}}{P}\right) + f_{r}\Delta r + \alpha\beta\frac{\Delta\dot{E}}{E} \qquad \text{(xix)}$$

(Contrast with expression (x) in the fixed rate case.)

On the other hand, the capital account expression remains unchanged and is given by expression (xiv).

$$\Delta K = Pf_{r}\Delta r - \Delta\dot{C}p \qquad \text{(xiv)}$$

To complete the analysis, note that (xix) gives the excess flow demand for goods and services while (xiv) gives the excess flow supply for domestic financial assets. The difference between the two is the excess flow demand for foreign financial assets. In a floating exchange rate regime, the rate will adjust to eliminate this excess flow demand; if we postulate a Marshallian adjustment process, we have

$$\dot{E}/E = e + f\left(\frac{D}{P} - \frac{K}{P}\right) \qquad \text{(xx)}$$

where

e is the expected value of $\dot{E}/E$

f is the market speed of adjustment to the excess flow demand

If we now substitute (xix) and (xiv) into (xx), we obtain the expression linking credit and the exchange rate as

$$P\left(\frac{\dot{\Delta E}}{E}\right) = \frac{(\dot{\Delta C})\ (1-Y) + Yfq - a)}{1 - \alpha\beta f} \qquad \text{(xxi)}$$

The interpretation of expression (xxi) is very similar to expression (xvi), in the fixed rate case. Again, credit policy has three channels: (i) through credit displacement; (ii) through income/expenditure effects; (iii) through demand for money effects. There are also similar policy implications. Just as in the case of fixed exchange rates credit creation has an immediate and substantial impact on reserve flows, so in the floating case, it has an immediate impact on the exchange rate. Monetary policy then becomes a substitute for reserve intervention policy. In addition, the size of the effect will depend systematically on what proportion of new credit extended is advanced the government and private sectors, respectively.

E. Summary and Conclusions

The preceding four sections have all considered different aspects of the same problem, namely how monetary policy interacts with the real economy. In the first section, we asked how monetary policy could be characterized and decided that it could only be described by consideration of a range of indicators of credit, money and interest rates. On further consideration of specific indicators, nearly all had some statistical or technical peculiarities which would have to be taken into account. Amongst the monetary aggregates M1 is least affected by distortions while M3 is distorted in several ways. Looking at M5 removes some of these but the most important, round-tripping, remains . This distortion is shared by bank lending.

In the second section, a model for the closed economy was derived using elements of both Keynesian and monetarist analysis. From the model, the conclusions follow that if an indicator is important, it must first be capable of control by the authorities and secondly the demand for it must be stable. This first condition may seem

trivial but there follows from it the powerful conclusion that M1 cannot have been a relevant variable over the past at least. Aggregate demand could be influenced in principle by credit, interest rates and by monetary variables: aggregate supply was mainly effected by the extent to which real money balances were a factor of production and in the manner in which expectations were formed. Consideration of the empirical evidence in the next section showed that interest rates had probably had little substitution effect on aggregate demand but may have had impact to the extent that they cause change in nominal wealth. Credit had influence only to the extent that it was in short supply, mainly bearing on personal sector expenditure particularly on durable goods and housing. Monetary, as opposed to credit policy can have had little effect until recently because the money supply was outside the authorities' control. With regard to aggregate supply, the evidence is thin on the ground but there is a strong suggestion that transactions balances are a factor of production. The process by which producers form their output price expectations is a big gap in our knowledge.

When the analysis is extended to the open economy, domestic credit expansion becomes central. In the fixed exchange rate case, credit expansion has strong immediate impact on reserve flows. These occur through three main channels: credit displacement, income-expenditure effects and effects on real money balances. Monetary policy rather than credit policy is not open to the authorities in the fixed rate case but is restored as an option in a floating rate regime. The same three channels generate in this case but now the effects are on the exchange rate itself. Monetary policy becomes a substitute for reserve intervention policy in this situation. In both cases, the proportion of new credit advanced to the government itself is an important determinant of behaviour.

The policy implications of all of this are as follows:

(a) in a floating regime, it is important to control the monetary aggregate M3 and probably M5. If a scheme could be devised to control M1 this could also be useful but it is difficult to see what this scheme could be;

(b) in a fixed rate regime, credit must be controlled, since this is effectively the only possible monetary policy. Credit remains important in the floating rate case;

(c) the destination of both credit and monetary policy is important. Care must be taken to ensure that policy designed to affect aggregate demand does not affect aggregate supply or vice-versa, if perverse results are not to occur. This suggests that differential controls to various sectors of the economy have important use. Even considering aggregate demand alone, credit interest rates and money have effects of different intensity on the personal and corporate sectors.

(d) Finally, balance of payments effects depend to an important extent on how expansions in credit and money supply originate. Fiscal policy would therefore remain important even if we had perfect control over its monetary consequences.

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