

Fiscal *versus* Monetary Rules*

1. Introduction

During recent years economic policy has had to be planned under conditions of much greater uncertainty than in the past. Policy-makers have been confronted with the twin tasks of reducing the pace of inflation and attempting to stabilise the economy, while these very problems make the outcome of their policies less certain. An attempt to break this vicious circle has been the adoption, in several countries, of *publicly* announced monetary targets. By pre-determining the authorities' actions, at least one source of uncertainty can be removed. And this could stabilise the public's expectations as well, at least after a transitional period¹ and provided the selected target is deemed to be relevant.² However, the outcome could be disappointing if it were known that the authorities had not sufficient control to be able to implement their targets,³ or if their

* This is a revised version of a paper presented at the 6th Money Study Group Conference, Oxford, September 1977. I wish to thank participants of that conference — particularly Benjamin Friedman, Willem Buiter and Charles Goodhart — for helpful comments. Peter Oppenheimer read an earlier draft and provided valuable suggestions for revision. The responsibility for remaining errors is mine alone.

The research underlying this paper was supported by a grant from the Ente per gli studi monetari, bancari e finanziari, "L. Einaudi", Rome.

¹ The likelihood of increased instability until the public's expectations have fully adapted to the new regime has been stressed by PARKIN (1977).

² This point has been taken to its extreme conclusions by CRIPPS-FETHERSTON (1977, p. 51): "if the market believes in, or is believed to believe in, the importance of monetary aggregates such as DCE or money supply, failure of the authorities to achieve a monetary target will adversely affect speculative confidence, irrespective of whether that monetary target has in itself good or bad real effects on the U.K. economy."

³ This is certainly the case if they are even unable to monitor the target variable, as has been the case with public expenditure both in the U.K. and in the United States. See EXPENDITURE COMMITTEE (1977, pp. 9-11) and BLINDER-SOLOW (1974, pp. 111-112).

choice of target had been controversial.⁴ This last aspect is very important, since we have had, for some years, a lively controversy over the relative merits of fiscal *versus* monetary instruments,⁵ and in the U.K. there have been supporters both for a fiscal policy rule and for a monetary aggregate rule.

The public sector deficit, money supply, and domestic credit have been suggested, in turn, to be the best indicators and targets of macroeconomic policy. Then, eventually, in 1976, the British Government declared its policy for the following two years, with publicly quantified targets for *all three* variables.

Not surprisingly, this somewhat "impartial" decision has been criticised from all sides. Moreover, a strategy based on multiple targets raises a host of questions. Once the "central forecasts" for these variables have been turned into "targets," what will the consequences be if their consistency later ceases, due to any unpredicted shift of the underlying relationships? And what will happen if, in fact, only one of these variables is relevant, but the other two are controlled as well?

In the literature, this case has not been explicitly examined. It is known, from Poole (1970), that in a closed economy a monetary target is more suitable with a stable demand for money, while an interest-rate target is better with stable expenditure functions. For an open economy, with fixed exchange rates, it is also known that a money-supply target is more effective in stabilizing income while a DCE target is more appropriate for a balance-of-payments objective.⁶ But what are the benefits, the costs and the risks, for income and balance-of-payments objectives, with targets for money supply, DCE, and the public sector deficit, given unpredicted disturbances of the structural relationships of the economy, whose parameters are only known within wide confidence limits?⁷

⁴ Not surprisingly, the Bank of England has tried to minimize this risk: "The principle of adopting a target may be more important than its precise form, or the particular magnitude to which the target relates." See Bank of England *Quarterly Bulletin* (June 1977, p. 151).

⁵ The controversy has centered on all the most important aspects of macroeconomic theory. For recent useful surveys, see BLINDER-SOLOW (1974) and STEIN (1976).

⁶ See POLAK-ARGY (1971) and VACIAGO (1975).

⁷ GOODHART (1975, pp. 239-240) asserts that Poole's analysis in terms of relative instability of IS/LM curves is not very relevant since those disturbances can be spotted and remedied. But this is politically less feasible once specific targets have been publicly announced. He stresses, however, the greater difficulties resulting from ignorance of the "true" structural relationships and this can certainly be accepted.

In this paper I intend to tackle these problems by examining, first, the assumptions that lead to a rule for each of the three variables. Then I shall quantify their differences with a simulation experiment, using a simplified macroeconomic model capable of reproducing the main features of those opposite approaches.

A brief review of the main criticisms that have been levelled against this "three-targets" policy may be a useful starting-point.

2. Money Supply, Domestic Credit and Public Sector Deficit

The financial objectives of British economic policy over the years 1977-79 have been defined in terms of PSBR (£ 8.7 billion in 1977/78 and £ 8.6 billion in 1978/79) and DCE (£ 9 billion in the 12 months ending 20th April 1977; £ 7.7 billion in the following 12 months; and £ 6 billion — subject to revision — in the year ending 18th April 1979). It was also announced that the rise in the sterling component of the money supply (M_3) during 1976/7 was to be contained within a range of 9% - 13%.⁸ Figures for PSBR and DCE were included in the Chancellor of the Exchequer's Letter of Intent to the IMF of 15th December 1976,⁹ in the form of *ceilings*, but they have been widely interpreted as *targets*. In fact, because of the degree of restriction they imply, and the associated short-term costs in terms of output and employment, it is likely that the authorities would wish to minimise any shortfall below these figures.

This strategy of economic policy has been criticised for a number of reasons. It has been argued that a reduction in the public sector borrowing requirement *will not* encourage the growth of exports and private investment, contrary to what was stated in the Letter of Intent.¹⁰ The specific targets for DCE have been rejected although for opposing reasons.¹¹ The consistency of DCE and M_3 targets has been questioned.¹²

⁸ The band for sterling M_3 growth was stated to be consistent with the DCE figure of £9 billion. See Bank of England *Quarterly Bulletin* (March 1977, p. 16).

⁹ The same targets were reaffirmed in July 1977: see CHANCELLOR OF THE EXCHEQUER (1977, par. 33).

¹⁰ See *National Institute Economic Review* (February 1977, pp. 38-39).

¹¹ Compare *Economic Policy Review* (March 1977, pp. 28-29): "The £7.7 billion DCE target set for the financial year 1977-8 will more-or-less be met, but... the DCE target for 1978-9 is too tight", with COBHAM (1977, p. 54): "The 1977-78 DCE target appears to be consistent with the Government's forecasts and objectives... For 1978-79, however, the DCE target appears to be too high".

¹² *Barclays Bank Review* (May 1977, p. 38): "DCE of £7.7 billion would result in an increase in sterling M_3 of more than 13 per cent. A figure of about 15 per cent seems more likely."

More fundamental criticism, however, has been directed to the choice of target variables. Three arguments may be distinguished.

Interpreting the PSBR as the key variable in the Government's strategy, the N.I.E.R. has commented: "The fundamental weakness of the PSBR is that its size fails to distinguish the influence of the budget on the economy from the influence of the economy on the budget... thus running budgetary policy according to a PSBR target may lead to *perverse* stabilisation policy: a shortfall from the employment target will increase the PSBR and may lead to *deflationary* action in an attempt to achieve the original PSBR target."¹³

Cambridge's E.P.R., on the other hand, interprets DCE as the central aggregate among the Government's targets, and rejects it with the following comments: "The adoption of firm commitments on the scale of DCE is in principle a mistake which could force the government to impose an unnecessary reduction in real output and employment... there is no justification at all for incorporating a DCE target in official economic policy. It will either prove ineffective because the increase in demand for money and the balance of payments deficit fall within the limits set for the DCE; or, if it is effective, it will constrain fiscal policy in an obscurantist manner, regardless of the consequences for growth of income and employment."¹⁴

As we shall see, both these criticisms stem from assumptions about the working of the economy which are different from those upon which the Government's strategy is supposedly based. A more damaging criticism, undermining the premises on which a monetary rule rests, is the one raised by the Governor of the Bank of England, when he stated that "In the United Kingdom we have not recently been able to observe a continuing stable relationship between money and incomes. Moreover, there can be structural changes in the financial, and more particularly within the banking, system which can change the amount of money that the economy needs."¹⁵

I shall consider the foregoing three criticisms in turn, beginning with the N.I.E.R.'s argument about the PSBR.

Their point against a PSBR target is, of course, well made, but to judge its validity it must be seen in relation to the given DCE

¹³ NIER (February 1977, pp. 43-44). The same criticism has been raised by WARD (1977, p. 73).

¹⁴ CRIPPS-FETHERSTON (1977, pp. 48, 54).

¹⁵ From a speech given on 17.1.77, reproduced in Bank of England *Quarterly Bulletin* (March 1977, p. 50).

target. In a simple "fiscal model," fixing the PSBR eliminates any "built-in" stability; indeed, it means that any exogenous shock to income is amplified. N.I.E.R. stresses the point that a lower level of income will entail deflationary action, and, of course, the opposite is also true. "Endogenous" tax rates and/or public expenditure will increase the income multiplier of autonomous expenditure.

However, given a DCE target the N.I.E.R.'s alternative proposal for a "full employment PSBR" target is not sufficient, unless the target for DCE has also been set at full employment income.¹⁶ This is because any change in income would still influence the actual PSBR in the opposite direction; and with DCE given, this would mean a corresponding change in DCE - PSBR, that is in bank credit available to the private sector and/or sales of public sector debt to the private (non-bank) sector.¹⁷ In other words, any "built-in" fiscal stabilisation would be accompanied, automatically, by destabilising (i.e. opposite) shifts in monetary policy.¹⁸ Apart from any distributional effects — the private sector will have to buy more bonds or be refused bank credit to the extent that it pays less taxes and receives more unemployment benefits, these effects being differently allocated — the net effects on income and the balance of payments will depend on the relative impacts of fiscal and monetary variables (policies).

By fixing both the PSBR and DCE, the net availability of domestic credit to the public and to the private sectors is determined. And this could be a "structural" goal desired by the Government.¹⁹ But in order to judge the implications for stability, during the target period, of this strategy which prevents a countercyclical fiscal policy, while avoiding a cyclical monetary policy, we still need a complete model of the economy.

The effects (if any) on income and the balance of payments of changes in the composition of DCE depends on the interest, income, and wealth elasticities of the demand for money and expenditure

¹⁶ Within the logic of a DCE strategy, this would imply estimating the demand for money at full-employment income.

¹⁷ The link between PSBR and DCE, in the redefined version consistent with a sterling M_3 , is given in Bank of England *Quarterly Bulletin* (March 1977, p. 40).

¹⁸ Incidentally, we may note here that, contrary to what is stated by CRIPPS-FETHERSTON (1977, p. 54), a target for DCE does not constrain fiscal policy alone, but allows for a wide range of fiscal and monetary policies.

¹⁹ In fact, in previous Letters of Intent to the IMF, PSBR forecast were mentioned, but only on this occasion was there a definite commitment, and, what is more, this was for two years.

functions, and the utility of having both targets for PSBR and DCE further depends on the causes of unpredicted changes in income during the target period.

Targets for DCE and the public sector deficit have been suggested with reference to very different transmission mechanisms of monetary and fiscal policies, so in the following sections I shall develop a brief exposition of those models, in order to compare their basic assumptions.

3. The Model of a Fiscal Policy Rule

A fiscal policy rule was proposed by the so-called "New Cambridge School," who also rejected the idea of a DCE target.

Very unfortunately, the "New Cambridge" initial insistence on the "empirical" validity of their propositions has focused most serious criticism at the empirical level;²⁰ while the confused presentation of its results has led to a very superficial debate on its theoretical basis.²¹ A simplified summary of their basic model will show why they regard a DCE target as, at best, irrelevant.²²

The suggested "New Cambridge" transmission mechanism is based on a sharp distinction between *private* and *outside* sectors. It is further assumed that the private sector has a stable demand function for net financial assets, essentially related to its disposable income.²³ Since the supply of net financial assets for the private

²⁰ See BISPHAM (1976).

²¹ ROWAN (1976) has stated that the "New School" is, without any justification, entirely at odds with conventional monetary theory. BRUNNER-MELTZER (in Stein, 1976, p. 158, n. 13) have dubbed "Neo-Cambridge" as "A revival of vulgar Keynesianism." On the other hand, SMITH (1976) has stressed their many monetarist similarities, going as far as to state that "If one substitutes Domestic Credit Expansion for Government Deficit, it is difficult to distinguish the results" (p. 199). Unfortunately, Smith has failed to see the difference between Government deficit and DCE.

²² However, some of the reasons given by CRIPPS-FETHERSTON (1977, p. 54) are misleading. They state that the authorities cannot guarantee a DCE target if the demand for money increases more than expected, because a rise in interest rates *increases* the demand for money. But we can note that the authorities are not worried by an increase in the demand for money, which will tend to improve the balance of payments; and the positive interest elasticity of the demand for money is simply due to the fact that, in their estimated function, they have *only* its own-rate. See CEPG (1977, p. 57). However, this specification can be criticised on a number of grounds. See GOODHART (1978) for a detailed account of money demand functions in the U.K.

²³ The precise specification of this function has undergone substantial changes. See CRIPPS-FETHERSTON-GODLEY (1976) and CEPG (1977).

sector comes from the public sector deficit²⁴ and the current balance of payments, equilibrium in the market for net financial assets (and thus implicitly in the output market) is determined by eq. [1]:

$$[1] \quad W = C + PSD + W_{-1}$$

Where: W = private sector net financial assets; C = current balance of payments; PSD = public sector financial deficit.

By adding the following three equations:

$$[2] \quad W = f(Y_d)$$

$$[3] \quad Y_d = Y - tY$$

$$[4] \quad C = f(Y, e)$$

Where: Y = gross domestic product; Y_d = private sector disposable income; t = tax-transfer rate; e = exchange rate

we have a stylized model which determines, given W_{-1} , PSD and the exchange rate, the endogenous variables Y , Y_d , W and C . Therefore, the authorities can always fix PSD (i.e. given public expenditure, alter t) to achieve any desired value of the current balance of payments, while another policy instrument (i.e. the exchange rate) could be used for an income objective.

Although the model is couched in terms which are familiar in conventional monetary theory, no serious consideration has been devoted to the assumed relevance of the private sector's net financial wealth. By interpreting the assumptions of the model in terms of monetary theory, we see that the two following propositions are implicit:

(i) A high degree of substitution within the private sector's financial wealth (i.e. between cash, government debt, and net private overseas assets);

(ii) A low degree of substitution between financial assets and real assets (low interest elasticity of the private sector's expenditure functions).

²⁴ The PSBR is the public sector's financial deficit plus borrowing to finance net lending to the private and overseas sectors. Thus only the PSFD measures the domestic supply of financial assets to the private sector. Although in recent years the two magnitudes have had different changes, in this paper I shall consider them as having a fixed relationship and treat them as interchangeable. Of course, the PSBR is the relevant target for a monetary rule, while the PSFD is relevant for a fiscal policy rule.

The relevant portfolio adjustment of the private sector is thus limited to the effects of *outside financial assets* on *private real assets*. A change in "inside" money (any increase in the money supply originated by increased bank credit to the private sector) has little effect, since it leaves unchanged the financial wealth of the private sector. While an increase in PSD will have the same effect, whether it is financed by cash or bonds, in both cases the process of portfolio readjustment will lead to an increased demand for real assets.

Now, can we find anything in orthodox monetary theory²⁵ which could give a meaning to this distinction of *inside* and *outside* financial assets, and justify the aggregation of the private sector's outside financial assets?

As a matter of fact, monetary theory holds that *outside financial assets* have a *wealth-effect* on the private sector demand for both real and financial assets. "New Cambridge" can thus be reconciled with orthodox monetary theory, if we are prepared to accept the following assumptions:

- (i) All outside financial assets have wealth effects;²⁶
- (ii) Wealth effects are more important on real expenditure than on demand for financial assets;²⁷
- (iii) *Wealth effects* are more important than *substitution effects*: there is a high interest elasticity in the demand for money and a low interest elasticity in private expenditure functions.

Under these conditions,²⁸ a fiscal policy rule matters, while a monetary aggregate, which also includes "inside" money, is irrelevant.

²⁵ See CRIPPS-FETHERSTON-GODLEY's (1976, p. 49) contention that "the theory of money (as distinct from 'monetarism') may provide the basic hypotheses which explain our empirical relationship."

²⁶ The Pesek-Saving thesis that "inside" money also has wealth effects is thus rejected. However, possible indirect support for the Pesek-Saving hypothesis is implied by adding bank advances as an independent variable in expenditure functions. Some evidence for this effect was given by Artis (1974, p. 541) and by the first version of "New Cambridge" equation. See CRIPPS-FETHERSTON-GODLEY (1976, p. 46). The fact that the change in wealth implied by a change in the interest rate is ignored by "New Cambridge", means that the private sector, while not discounting the stock of public debt, discounts any capital gain or loss due to a change in the rate of interest.

²⁷ With inflation, there is a negative wealth effect on expenditure functions, and there is, in fact, some evidence for this effect in recent years.

²⁸ When originally advanced in newspaper articles, "New Cambridge" functions did ignore monetary policy. Later [see EXPENDITURE COMMITTEE (1974)], monetary variables were included but were statistically not significant. Finally, see CEPG (1977), monetary variables were deemed to be quantitatively not important. This is where "New Cambridge" parts from Brunner's "fiscal monetarism" [see BRUNNER (1976)], since Brunner has both wealth effects from PSBR and substitution effects.

4. The Model of a Monetary Rule

The portfolio adjustment, and thus the transmission mechanism assumed by a monetary rule are quite different. I shall exemplify the model underlying a DCE strategy, as taken from its original IMF source.²⁹ In this case, a rigid line is drawn between *monetary* and *non-monetary* assets, due to the unique characteristics of money (not a close substitute for any other single asset), which are relevant whether it is "inside" or "outside" money.³⁰ In an open economy, the stock of money is the counterpart of domestic credit and foreign reserves; thus equilibrium in the money market (and implicitly in the bond market) is given by eq. [5]:

$$[5] \quad M = \Delta R + DCE + M_{-1}$$

Where: M = money supply; ΔR = change in net foreign assets of consolidated banking system; DCE = domestic credit expansion.

It is further assumed that the private sector has a *stable demand for money*, with income and the rate of interest as arguments:³¹

$$[6] \quad M = f(Y, r)$$

And then we add equations [7] and [8] giving the balance of payments and the equilibrium condition of the output market:

$$[7] \quad \Delta R = f(Y, r)$$

$$[8] \quad Y = f(X, r)$$

Where: X = exogenous variables such as exports, public expenditure, tax rates, etc.

With a fixed exchange rate, eqs. [5]–[8], given X and M_{-1} , determine Y , M , r and ΔR for a given DCE . Thus the authorities

²⁹ See POLAK-ARGY (1971). As it is well known, this approach was then generalized into the long-run monetary theory of the balance of payments; see JOHNSON (1972). The literature on this approach has accumulated in recent years; for some useful surveys, see CLAASSEN-SALIN (1976).

³⁰ Friedman has recently stressed the fact that he does not attach any importance to the inside/outside distinction. See FRIEDMAN in Stein (1976, p. 317). Other monetarists (e.g. Brunner-Meltzer) would disagree on this point.

³¹ Neither POLAK-ARGY (1971) nor JOHNSON (1972) mention "net wealth" as an independent variable in the demand for money function, but most monetarists would include W as well (or substitute it for income). Note that the price level is assumed in eq. [6] to have been given, otherwise the function must be specified in terms of real money demanded.

can always fix DCE to achieve any desired value for the balance of payments.³² (In the long run, in the case of a small economy with prices, real income and the interest rate given, there will be no room for an independent monetary policy). Given DCE, the money supply and interest rate are endogenous in the model, and any excess demand (supply) for money will eventually be accommodated by a change in foreign reserves (the distinction between the current and the capital account of the balance of payments not being relevant).

The basic assumptions of this model are the following:

(i) Money and bonds are poor substitutes, resulting in a low interest elasticity of the demand for money function;

(ii) Bonds and real assets are good substitutes; producing a high interest elasticity of the private sector expenditure functions;³³

(iii) The inside/outside distinction does not matter; in fact, inside and outside bonds are good substitutes: there are crowding-out effects with a bond-financed increase in government expenditure, as the private sector adjusts its portfolio to the increased supply of public bonds by reducing its demand for private bonds.³⁴

The relevant portfolio adjustment of the private sector is therefore given by the effect of changes in the supply of monetary assets on all other real and financial assets (and liabilities). On the other hand, the PSBR has not entirely disappeared, but in this context it has no "fiscal" meaning, since only the PSBR *less* any sale of public bonds to the private (non bank) sector, is a component of DCE. Given DCE, any change in PSBR will be offset by an equivalent change in government bonds sales and/or by reduced bank credit to the private sector. And this is just another way of saying that, within a DCE model, a change in its composition is deemed to be irrelevant.³⁵

³² This is why the IMF, when arranging its stand-bys, asks for ceilings to be put on DCE. In fact, a DCE ceiling has been introduced in the U.K. with the 1969 Letter of Intent, but it subsequently disappeared. See ARRIS (1974, p. 538, n. 36). It was "rediscovered" when a new Letter of Intent had to be written to the IMF in 1976. But while in 1969 it had been accepted reluctantly, this time the authorities went on record as stating that DCE met their long-run strategy of monetary targets.

³³ We follow here the tradition of Samuelson-Tobin-Modigliani *et alii*, although monetarists like Friedman, Brunner and Meltzer object to this interpretation in terms of IS/LM interest elasticities.

³⁴ Alternatively, the same crowding-out effects can be represented in terms of interest-rate elasticities of IS/LM curves when an increase in public expenditure has to co-exist with a constant money supply.

³⁵ Of course, one possibility of enforcing a DCE target is by fixing both the PSBR and the private sector's bank advances, and then selling (or buying) government bonds in the appropriate amounts.

5. A Model of a Fiscal and Monetary Rule (?)

Having assessed the two transmission mechanisms from which either a fiscal or a monetary rule³⁶ can be derived, we have seen that their crucial difference can be expressed in terms of wealth effects *versus* crowding-out effects.

The distinction between *inside* and *outside* financial assets implies positive wealth effects of all outside financial assets on a stable private expenditure function. The distinction between *monetary* and *non-monetary* assets implies "perverse" wealth effects (or "crowding-out," as they are called nowadays) of bond-financed public expenditure, given a stable demand for money.³⁷

It is thus evident why the "New Cambridge" rejects a DCE target and why a target for the PSD alone is not consistent with the IMF model. But it is also surprising that both targets were accepted by the British authorities: they have never before paid much attention to wealth effects of either variety. Following a long tradition, the monetary authorities in the United Kingdom have not adhered to either of those two transmission mechanisms (in fact, to any simple and well-defined transmission mechanism). On the contrary, they have repeatedly stressed the following points:

- (i) The importance of all financial intermediaries;
- (ii) The importance of sectoral flow-of-funds and net financial balances;
- (iii) The instability of the demand for money;
- (iv) The "mystery" of the transmission mechanism of monetary policy.³⁸

Taken together, these points imply that neither the money supply nor the private sector's financial wealth can be used as a single in-

³⁶ It must be stressed that what matters is not the specific targets, but the *rules* according to which the targets will be selected and given a specific value.

³⁷ Strictly speaking, while crowding-out effects certainly contradict the "New Cambridge" model, the IMF model could dispense with them and still predict a stable relationship between DCE and the balance of payments, provided that any increase in bond-financed expenditure (DCE unchanged) raises income and interest rates, in such a way that the worsening of the current account is *exactly* offset by a capital inflow (ΔR unchanged). For a lengthy discussion on crowding-out — unfortunately confined to a closed economy — see STEIN (1976).

³⁸ These points were all raised by the Governor of the Bank of England in the above-quoted speech. See also GOODHART (1978).

indicator or target. We are instead given a long list of partial indicators. Total financial assets are more relevant than monetary assets, if there is a demand for money by the private sector which has a high and unstable interest elasticity. Similarly, "outside" money is more relevant than the whole money stock, if there are shifts in the demand for money which are largely accommodated by changes in bank credit, without much effect on other markets for financial and real assets.³⁹ Thus, targets for the private sector's total financial assets or for "outside" money alone would be more useful in these two cases, than a target for DCE. This further implies that DCE should not be taken as homogeneous, since changes in its composition effect the private sector's demand for real and financial assets. On the other hand, the emphasis on sector financial balances implies that not even the private sector is homogeneous, the more so when firms finance their acquisition of real assets by bank advances which are balanced by the personal sector's holding of bank deposits. This may explain why the absolute values of the financial balances of the personal and corporate sectors are relevant⁴⁰ and it could imply a more stable demand for total financial assets limited to the personal sector.

In conclusion, we can see that the authorities' adherence to a DCE target does not square with the IMF model (on the contrary, they tend to take a "fiscalist" view of interest elasticities of money and real-asset demand functions), while their preoccupation with the PSBR does not indicate that they attach much importance to wealth effects on private sector expenditure either.⁴¹ What, then, are the implications of both DCE and PSBR targets within this more eclectic model? Strictly, to answer this question, we ought to simulate a model large enough to capture all the different effects that have been listed earlier, i.e. taking account of all the financial relations in the economy. To simplify the task and still be able to give at least a partial answer, I have put together the two simple models suggested by the proponents of the fiscal and monetary rules presented in the previous sections. Not surprisingly, this produced something which

³⁹ For what has been experienced in the U.K. since 1971, see GOODHART (1978).

⁴⁰ "There might be significant economic consequences resulting from shifts in the balance of financial indebtedness between groups within the private sector, especially between companies and persons", GOODHART (1975, p. 206).

⁴¹ See, however, the recent attempt to relate consumption expenditure to changes in the personal sector's liquid assets, in TOWNEND (1976). For another, less sophisticated, attempt, see FISHER (1975).

is really a modified IS/LM model, for an open economy with wealth effects. The differences between the two transmission mechanisms (our ignorance of the "true" economic relations) are captured by different interest elasticities of demand for money and expenditure functions, by different wealth effects on those functions, and by different assumptions on their relative stability. A simple simulation experiment will provide an indication of what the effects are, with DCE and PSBR targets, in the two extreme cases.

6. A Simulation Experiment

The model (with the usual assumptions about the signs of partial derivatives) is as follows:

$$\begin{aligned}
 [1] \quad & Y = A(Y_d, r, W_o) + G + C(Y) \\
 [2] \quad & Y_d = Y - tY \\
 [3] \quad & PSD = G - tY \\
 [4] \quad & \Delta M = L(Y, r, W_o) - M_o \\
 [5] \quad & \Delta M = \Delta R + DCE \\
 [6] \quad & \Delta R = C(Y) + \Delta BF(r) \\
 [7] \quad & \Delta W = \Delta M + \Delta B - \Delta CR \\
 [8] \quad & PSD = (DCE - \Delta CR) + \Delta B
 \end{aligned}$$

Where the new variables are: A = private sector total expenditure; G = public expenditure; BF = government bonds held by foreign investors; CR = bank advances to the private sector; B = government bonds held by the (non-bank) private sector. W_o and M_o are the private sector's financial wealth and the money stock, at the beginning of the period.

As the model is simple and quite traditional, there is no need for a lengthy explanation of its characteristics. Eqs. [1]–[3] give the IS curve (equilibrium in the output market); while eq. [3] determines the public sector deficit (here, again, assumed to correspond to the PSBR) given G and t ; or, alternatively, it determines G or t , given the PSD. Eqs. [4]–[6] give the LM curve (equilibrium in the money-bond market). It is assumed that there are no private capital movements (or that they are under the control of

the monetary authorities), thus capital inflows are only invested in government bonds (foreign interest rates being given, as well as exchange rates). Eqs. [7] and [8] define the private sector's financial constraint and the government sector constraint; (DCE- Δ CR) being the "monetary" financing of the public deficit. It is further assumed that Δ CR has been fixed by the authorities to guarantee a target for DCE; thus eq. [8] actually determines the government bonds held by the private sector. Of course, the model could be made more complex (and, perhaps, more realistic) by including lags (apart from the one given by wealth effects in eqs. [1] and [4]; endogenous prices⁴² and exchange rates; the effects of interest rates changes on PSD and on private financial wealth; expectations; private capital movements and a demand function for bank credit (thus more than one interest rate). But even with this very simplified structure, the model is capable of clarifying the implications of different policy rules. It includes both *substitution* and *wealth* effects, the latter operating only after the first period.⁴³ By adding shift variables to eqs. [1] and [4], we can check the effects on income and the balance of payments of unpredicted shifts in the demand for money and in private expenditure, under alternative policy rules.

The main conclusions of this analysis — without placing any unrealistic restriction on the partial derivatives of the model — can be summarised as follows.

Firstly, comparing targets for DCE and for the money supply, a DCE target proves to be more efficient in attaining both objectives (Y and Δ R) so long as there is a shift in the demand for money. However, with a shift in the expenditure function, a DCE target minimises the impact it has on the balance of payments, but a money-supply target leads to lower variation in income. This result is consistent with the "monetarist" logic of the IMF model, which suggests a DCE target by assuming a stable demand for money. In fact, even if the demand for money is unstable, a DCE target is better than a money-supply target.

Secondly, adding a PSBR target to DCE, enlarges the effects of shifts in expenditure functions, but not necessarily the effects (on income and the balance of payments) of shifts in the demand for money. In this case, however, the actual results depend crucially on

⁴² Note, however, that the "New Cambridge" equation is now specified in money terms. See CRIPPS-FETHERSTON-GODLEY (1976).

⁴³ See TURNOVSKY (1977, pp. 39-40).

the specific values of the parameters of the model. Thus — following Christ's (1967) seminal paper — I have selected not unreasonable parameters to differentiate two extreme cases. I have assumed, for both cases, the following values: $A_y = .9$; $C_r = -.2$; $t = .2$, and the following elasticities:⁴⁴ $BF_r = 1.$; $L_y = 1.$. Then for the first ("fiscalist") case, the elasticities: $L_r = -.6$ and $A_r = -.05$; and for the second ("monetarist") case, the elasticities: $L_r = -.1$ and $A_r = -.3$. I have further assumed that, in the first case, any change in private wealth is largely (90%) spent on real assets and that only 10% is invested in money and bonds; while in the second case I have assumed an equal (1/3) effect on demand for real assets, money and bonds.

With these numerical values inserted, the model confirmed that adding a PSBR target to a DCE target increased the effects on income of shifts in the demand for money and private expenditure functions, the more so in the latter case, and with "fiscalist" assumptions. But for the balance-of-payments objective, its reaction to a shift in the expenditure function was only slightly increased, and it actually diminished in the case of a shift in the demand for money function, particularly with "monetarist" assumptions.

In other words, with "monetarist" assumptions, by having both targets, the risks of missing a balance-of-payments objective because of instability in the demand for money are actually diminished. This result is not altogether surprising, since "monetarist" assumptions imply "crowding-out" effects which are eliminated by the addition of a PSBR target to the model. Without a PSBR target, an increased liquidity preference would force the monetary authorities to sell more bonds at a time of declining demand, thus accepting greater changes in interest rates. The fact that, in this case, by adding a PSBR target, a greater stability in interest rates is assured, can explain the authorities' choice of both targets, in order to conciliate monetary targets with their traditional preference for interest rate stability.

Having solved the model for those numerical values, we can also compare the effects on income and the balance of payments of changes in the two targets. I have examined the impact of a change in PSBR with a given DCE (a bond-financed change in PSBR) and the impact

⁴⁴ Elasticities were converted into structural parameters by using the 1970-75 averages of the relevant variables, as taken from C.S.O., *Annual Abstract of Statistics*, London, 1976.

TABLE 1
MULTIPLIERS ON INCOME AND FOREIGN RESERVES

	"Fiscalist" assumptions		"Monetarist" assumptions	
	1st period	2nd period	1st period	2nd period
$\frac{\Delta Y}{\Delta PSBR}$	2.72	3.82	.49	.25
$\frac{\Delta R}{\Delta PSBR}$	-.27	-.38	.07	.18
$\frac{\Delta Y}{\Delta DCE}$.38	.19	1.37	1.30
$\frac{\Delta R}{\Delta DCE}$	-.20	-.18	-.34	-.31

of a change in DCE with a given PSBR (an open market sale or purchase of government bonds). Since I am not interested in the long-run properties of the model,⁴⁵ I have computed only first- and second-period multipliers (see Table 1).

The results are very different in the two cases and for the two policies. The following points in particular may be noted:

(i) With "monetarist" assumptions (low L_r and high A_r) changes in DCE have more effect, on both income and the balance of payments, than changes in PSBR; and vice versa with "fiscalist" assumptions.⁴⁶

(ii) Although the different interest elasticities already explain a large part of the foregoing difference (with crowding-out effects operating in the "monetarist" case), the effects of the two policies are more diverse after two periods than after one, because of different assumptions about wealth effects. These effects will operate until any change in the private sector's financial wealth has been absorbed

⁴⁵ Because the model is not properly specified for long-run equilibrium, and because we accept HANSEN's (1973, p. 553) remark that "it would be entirely unrealistic to assume that the authorities should remain passive during a process towards a long-term stationary state (that may not exist)." Since BLINDER-SOLOW (1974), however, there has been a renewed interest in long-run analyses of fiscal policy.

⁴⁶ Note that with "monetarist" assumptions a change in PSBR is associated with a positive change in both income and foreign reserves. Capital inflows more than compensate current account changes, because of greater interest rate movements.

either by real expenditure (thus varying income and being partly reversed by the current balance of payments), or by an increased demand for money and bonds. In this experiment, we can see that the assumed elasticities for the "fiscalist" case are not sufficient to give "New Cambridge" results (without any change in the demand for money and bonds, the equilibrium income multiplier would be

the reciprocal of the propensity to import, at which $\frac{\Delta C}{\Delta PSBR} = -1$).

But the adjustment is almost completed at the end of the second period, when the current balance of payments has offset 76% of the changed PSBR.

(iii) Finally, the multipliers presented in Table 1 imply that, with "monetarist" assumptions, both income and the balance of payments are more affected by instability of the demand for money than by instability of expenditure functions; and vice versa, with "fiscalist" assumptions. Obviously, it is precisely in circumstances where monetary policy is more effective that a monetary rule makes monetary disturbances most destabilising. The only way to escape from this constraint, if one has to accept a DCE target while knowing that the demand for money is unstable, is to "take refuge" in fiscalist elasticities.

7. Conclusions

The purpose of this paper was the limited one of exploring the implications of fiscal and monetary rules in varying circumstances. I have not considered any of the technical problems of targetry,⁴⁷ but I have examined the necessary conditions for the various rules to achieve something like their objective, and the risks that are taken if they are not confirmed in reality. It has been shown that "New Cambridge" results can be derived from a fairly traditional model, assuming a stable expenditure function with pronounced wealth

⁴⁷ The American system of "rolling" targets for rates of growth of different definitions of the money stock has been criticised by Poole (1976). The present U.K. system of annual targets for absolute values is much simpler, but it is still affected by the problem of revisions of initial values. For instance, as the PSBR for 1976/77 turned out much lower than originally forecast, was there a case for revising upwards the 1977/78 ceiling?

effects, together with "fiscalist" elasticities (high L_r and low A_r). Under suitable conditions of this type, a change in the PSD will be matched by an equivalent opposite change in the current balance of payments. A DCE target is based, instead, on the idea of a stable demand for money, with "monetarist" elasticities (high A_r and low L_r) and wealth effects which are shared by real- and financial-asset demand functions. Under these conditions, there is a stable relationship between DCE and the balance of payments, while any change in bond-financed public expenditure will have pronounced crowding-out effects.

If we had non-stochastic estimates of stable behavioural relationships, any policy rule could be useful but, at the same time, not really necessary. The simulation experiment has confirmed that very different results are obtained when using different interest elasticities. Unfortunately, we still lack firm evidence on the precise value of these parameters. It could be argued that in recent years, because of two-digit inflation, the various elasticities have shifted towards the "fiscalist" case, short and long financial assets being considered better substitutes, and financial assets being worse substitutes for real assets. If that is the case, targets meant substantially to reduce inflation should take into account the likelihood of a subsequent reverse shift of those parameters.

The simulation experiment has also confirmed the different effects resulting from instability. Neo-classical economists, such as Dennis Robertson and Friedrich Hayek,⁴⁸ assumed that economic instability originated from shifts in the demand for money requiring appropriate offsetting by responsible central bank action to prevent it from disturbing "real" equilibrium. Keynes, on the other hand, stressed the fact that the marginal efficiency of capital is unstable, its shifts causing additional shifts in liquidity preference and in the propensity to consume.⁴⁹ Thus, simply admitting that "there will be stochastic disturbances in both the real and the monetary sectors

⁴⁸ See NOBAY-JOHNSON (1977, pp. 474, 478).

⁴⁹ The passage from the *General Theory* is worth quoting: "A serious fall in the marginal efficiency of capital also tends to affect adversely the propensity to consume. For it involves a severe decline in the market value of Stock Exchange equities. Now, on the class who take an active interest in their Stock Exchange investments, especially if they are employing borrowed funds, this naturally exerts a very depressed influence. These people are, perhaps, even more influenced in their readiness to spend by rises and falls in the value of their investments than by the state of their income" (p. 319).

of the economy" (Poole, 1970, p. 202) is not really enough. But here again, firm evidence on the interaction of shifts in the various relationships is still lacking. Thus, the authorities are always confronted with the choice of reacting early (risking reaction to shifts which are only *temporary*) or waiting until a *permanent* shift has been clearly detected. In the latter case, the adjustment process will already have been at work, so a revision of the targets will impose a new adjustment process on the economy. In both cases, the authorities risk adding instability by revising their targets.

In an uncertain world, a stable *reaction function* by the authorities could stabilise the public's expectations more than fixed targets which need frequent revisions. After all, one may not accept the conservative view that these fixed targets are really meant to prevent the Government from destabilising an otherwise stable economy, and yet not necessarily believe that a fixed monetary target will stabilise an otherwise unstable demand for money.

Ancona

GIACOMO VACIAGO

REFERENCES

- ARTIS, M. J., "Monetary Policy in the 1970s in the Light of Recent Developments," in Johnson, H. G. and Nobay, A. R. (eds.), *Issues in Monetary Economics*, Oxford University Press, Oxford, 1974, pp. 517-545.
- BISPHAM, J. A., "The New Cambridge and 'Monetarist' Criticism of 'Conventional' Economic Policy Making," *National Institute Economic Review* (November 1975), pp. 39-55.
- BLINDER, A. S. and SOLOW, R. M., "Analytical Foundations of Fiscal Policy," in *The Economics of Public Finance*, Brookings Institution, Washington, 1974, pp. 3-115.
- BRUNNER, K., "Inflation, Money and the Role of Fiscal Arrangements: An Analytic Framework for the Inflation Problem," in Monti, M. (ed.), *The "New Inflation" and Monetary Policy*, MacMillan, London, 1976, pp. 25-81.
- C.E.P.G., *Technical Manual on the CEPG Model*, Department of Applied Economics, University of Cambridge, May 1977.
- CHANCELLOR OF THE EXCHEQUER, *The Attack on Inflation after 31st July 1977*, HMSO, London, July 1977.
- CHRIST, C. F., "A Short-run Aggregate-Demand Model of the Interdependence and Effects of Monetary and Fiscal Policies with Keynesian and Classical Interest Elasticities," *American Economic Review* (May 1967), pp. 434-443.
- CLAASSEN, E. and SALIN, P. (eds.), *Recent Issues in International Monetary Economics*, North-Holland, Amsterdam, 1976.

- COBHAM, D., "The Debate over the Letter of Intent," *The Banker* (February 1977), pp. 49-54.
- CRIPPS, F., FETHERSTON, M. and GODLEY, W., "What is Left of 'New Cambridge'?" *Economic Policy Review* (March 1976), pp. 46-49.
- CRIPPS, F. and FETHERSTON, M., "The Role of Monetary Policy in Economic Management," *Economic Policy Review* (March 1977), pp. 48-54.
- EXPENDITURE COMMITTEE, Ninth Report, *Public Expenditure, Inflation and the Balance of Payments*, HMSO, London, July 1974.
- EXPENDITURE COMMITTEE, Fourth Report, *White Paper on the Government Expenditure Plans*, HMSO, London, March 1977.
- FISHER, D., "Wealth Adjustment Effects in a Macro-economic Model" in Parkin, M. and Nobay, A.R. (eds.), *Contemporary Issues in Economics*, Manchester University Press, Manchester, 1975, pp. 63-79.
- GOODHART, C. A. E., *Money, Information and Uncertainty*, MacMillan, London, 1975.
- GOODHART, C. A. E., "Problems of Monetary Management: The U.K. Experience," forthcoming in Courakis, A. S. (ed.), *Inflation, Depression and Economic Policy in the West: Lessons from 1970's*, Blackwell, Oxford, 1978.
- HANSEN, B., "On the Effects of Fiscal and Monetary Policy: A Taxonomic Discussion," *American Economic Review* (September 1973), pp. 546-571.
- JOHNSON, H. G., "The Monetary Approach to the Balance-of-payments Theory," reprinted in *Further Essays in Monetary Economics*, Allen & Unwin, London, 1972, pp. 229-249.
- KEYNES, J. M., *The General Theory of Employment Interest and Money*, MacMillan, London, 1936.
- NOBAY, A. R. and JOHNSON, H. G., "Monetarism - A Historic - Theoretic Perspective," *Journal of Economic Literature* (June 1977), pp. 470-485.
- PARKIN, M., "The Transition from Fixed Exchange-Rates to Money Supply Targets," *Journal of Money, Credit and Banking* (February 1977), pt. 2, pp. 228-242.
- POLAK, J. J. and ARGY, V., "Credit Policy and the Balance of Payments," *IMF Staff Papers*, March 1971, pp. 1-21.
- POOLE, W., "Optimal Choice of Monetary Policy Instruments in a Simple Stochastic Macro Model," *Quarterly Journal of Economics* (May 1970), pp. 197-216.
- POOLE, W., "Interpreting the Fed's Monetary Targets," *Brookings Papers on Economic Activity*, 1976, n. 1, pp. 247-259.
- ROWAN, D. C., "Godley's Law, Godley's Rule and the 'New Cambridge Macroeconomics'," in this *Review* (June 1976), pp. 151-174.
- SMITH, R. P., "Demand Management and the 'New School'," *Applied Economics* (September 1976), pp. 193-205.
- STEIN, J. L. (ed.), *Monetarism*, North-Holland, Amsterdam, 1976.
- TOWNEND, J. C., "The Personal Saving Ratio," *Bank of England Quarterly Bulletin* (March 1976), pp. 53-73.
- TURNOVSKY, S. J., *Macroeconomic Analysis and Stabilisation Policy*, Cambridge University Press, Cambridge, 1977.
- VACIAGO, G., "A Re-evaluation of Financial Targets," in this *Review* (June 1975), pp. 203-217.
- WARD, T. S., "Public Expenditure Plans and Fiscal Policy," *Economic Policy Review* (March 1977), pp. 71-79.