ASSESSING THE EFFECTIVENESS OF U.K.FISCAL AND MONETARY POLICY 1950-1967.

G.T.Renshaw

Number 103

WARWICK ECONOMIC RESEARCH PAPERS

DEPARTMENT OF ECONOMICS

UNIVERSITY OF WARWICK
COVENTRY

ASSESSING THE EFFECTIVENESS OF U.K.FISCAL AND MONETARY POLICY 1950-1967.

G.T.Renshaw

Number 103

January 1977

The fact that misguided macro-economic policy could easily do more harm than good was first demonstrated by A.W.Phillips in two frequently cited articles which appeared in 1954 and 1957 {1,2}. Using models and simulation techniques first developed by engineering control theorists, Phillips concluded that "as these relationships (i.e. the lags in the real economic system) are not well known quantitatively, it is unlikely that the policy applied will be the most appropriate one; it may well cause cyclical fluctuations rather than eliminate them". He also concluded that the most harmful type of policy intervention was likely to be that which was applied after a long delay, and which had a large and immediate impact.

A little later, in 1964 Dow reached the much quoted conclusion that "as far as internal conditions are concerned then, budgetary and monetary policy failed to be stabilising, and must on the contrary be regarded as having been positively destabilising" {3,p.384}. Though his conclusion lacked a firm econometric foundation, it could not be ignored if only because, as the government's Chief Economic Adviser, Dow had clearly been at the centre of the policy making stage. Moreover, his conclusions inevitably reflected somewhat on his own competence in the tenure of his office and could not therefore have been reached lightly. By the early 1960's the view was widespread that policy intervention had frequently been too large, and too late; and Harold Wilson's 1964 election campaign brought the phrase "stop-go" into common usage to describe this phenomenon. Many people persuaded

themselves that improvement both in timing and in magnitude of policy intervention was possible and would be sufficient both to increase Britain's sluggish growth rate and to achieve simultaneously full employment and balance of payments equilibrium without recourse to devaluation. While Dow had seen the task of policy primarily as that of maintaining full employment subject to a balance of payments constraint, the Musgraves in what has since become the standard approach identified a number of policy instruments which may be employed in the pursuit of a number of policy objectives {4}. Though they saw the number of policy instruments as at least equal to the number of objectives, so that in principle some degree of freedom in the "mix" of policies is possible, the Musgraves regarded the main difficulties for the policy maker as arising from political constraints or from the complex structural relationship between objectives and between instruments and objectives. Despite their generalised approach to the problem, they nonetheless proceed to discuss the effectiveness of fiscal policy not only in isolation from monetary policy but also almost solely in terms of its impact on domestic demand. To do this, it is first necessary to define an appropriate measure of fiscal intervention. The obvious measure is the government's "fiscal leverage", defined as the difference between the actual level of G.N.P. and hypothetical G.N.P. if government revenue and expenditure had both been zero. Taking account of the balanced budget multiplier, this calculation gives government revenue a leverage of unity and the budget deficit a leverage equal to the ordinary multiplier, estimated by Godley and Hopkin to be about 1.4 {5}. However there

is room for argument about whether the leverage of the central government alone, or that of the local authorities and public corporations in addition, is appropriate. Some observers had argued that revenue and expenditure decisions of local authorities and public corporations were not motivated by considerations of macro-economic policy and should therefore be excluded. It was further possible to argue that central government expenditure plans were (or should be) unaffected by cyclical considerations, and this view was legitimised by the Plowden Report of 1961 {6}. This left only variations in central government revenue as an indicator of fiscal stance, but part of this variation of course was caused by, rather than caused, variations in GNP. Having deducted this one was left with discretionary variations in tax yield, achieved by variation in tax rates, as the appropriate indicator of fiscal intervention. Looking at these discretionary tax changes (which were also examined by Surrey and Shepherd {7} and by Bristow {8}, the Musgraves found that their correlation with unemployment was usually "correct" in its sign, but that the correlation with the output cycle was usually perverse. This was explained by the fact that employment changes lagged significantly behind output changes, at least in the period up to 1967 being considered. This perverse correlation had also been noted by Prest {9} who found a significant negative (i.e. perverse) correlation between government expenditure changes and an index of spare capacity.

As well as looking at discretionary tax changes, the Musgraves also examined central government fiscal leverage. They concluded that central government accounted for only a small proportion of total public sector leverage, and that changes in central government leverage had often been

partly or wholly neutralised by opposite changes in the leverage of local authorities and public corporations. Consequently, although as noted above discretionary tax changes were usually correctly related to current unemployment (and also to the balance of payments and price level changes) these discretionary changes were blunted and sometimes reversed by contemporaneous changes in the fiscal leverage of the public sector as a whole.

The Musgraves overall verdict on the success of fiscal policy in the period 1950-67 was slightly less harsh than Dow's. They concluded that "the policy requirements of various goals moved in diverse and other conflicting ways", thus apparently suggesting in contradiction of their earlier optimism on this question, that at least part of the superficial lack of success of policy arose from the fact that the number of policy instruments fell short of the number of policy goals, leading to over-determinacy. Nonetheless, they concluded that "some degree of freedom was left which was not always appropriate used", for example in the over-delayed recoveries of 1954-55 and 1959-60, and the excessive expansion of 1963-4.

More recently Cohen {10}has appraised fiscal policy in the 1960-64 period and reached the conclusion, in line with Dow and the Musgraves, that "in general budgetary policy over the period as a whole has been destabilising, in the sense that growth would have proceeded more smoothly in the absence of discretionary tax changes. His method is to use the Musgraves' "leverage" concept, translated into specific

quantitative magnitude using the National Institute calculations developed by Godley & Hopkin {5}, to calculate the change in GDP attributable to discretionary tax changes. These induced changes in GDP are then compared with the actual changes, revealing that "discretionary tax changes operated in a weak anti-cyclical manner in 1962/3 to 1965/6 and were significantly pro-cyclical in 1958 to 1959/60, 1960 to 1962/3 and 1966/67."

A shortcoming common to all the work discussed so far here is the failure to construct anything other than the crudest of ad hoc models for the appraisal of fiscal policy. As Worswick was easily able to demonstrate {11}, even in the simplest macro-economic model with one policy instrument and one policy objective, "successful" use of the instrument is compatible with almost any observed relationship between the instrument and the objective. Unless one has some information, or is prepared to make an assumption, about the source of exogenous disturbance and the relevant lag structures, no sensible assessment of the success of policy is possible. While Worswick's remarks were prompted primarily by Prest's naive correlation {9} between discretionary tax changes and the margin of spare capacity, they apply equally to the other writers discussed above. If there are several policy instruments and policy objectives, the problems of appraisal are enormously magnified. While for example both the Musgraves and Cohen refer to the balance of payments acting as a constraint on the use of fiscal policy to control aggregate demand, this assumed relationship

is never formalised and embodied in a model. One might equally postulate that the level of aggregate demand had acted as a constraint on the use of fiscal policy to control the balance of payments, which might well lead to totally different conclusions about the "success" of fiscal policy. As well as allowing for multiple policy objectives, it is necessary to allow for the interaction between policy instruments; yet both the Musgraves and Cohen are content to discuss both fiscal and monetary policy in isolation from one another. To be fair, the Musgraves appear to have tried to tackle this problem by estimation of some regression relationship between the various instruments and various targets. The validity of this approach will be discussed further below but presumably the Musgraves' results were not very encouraging since they are not reported.

More formal approaches to the problem which go some way towards meeting these objections (though at considerable cost) have been made by Fisher and Pissarides {12,13}. They recognise that a rigorous approach to the appraisal of policy requires, first, that the structural relationship between targets and instruments be specified or estimated and second that some explicit assumptions about the government's preferences with respect to the target variables be made. Depending on the degree of disaggregation of the structural model and the form of the government's utility function, obviously a wide variety of models for the appraisal of economic policy are possible.

Pissarides' approach is highly general. He postulates a vector (y) of policy target variables and a vector (x) of policy instruments. These are presumed to be related by a set of structural equations $y = Rx + s$, where s is a vector of exogenous variables (which he subsequently ignores). Assuming the government has target values y^* and x^* for y and x, it is assumed that the government's behaviour is aimed at minimising a quadratic loss function $L = w(y-y^*)^2 + v(x-x^*)^*$ for some weight vectors w and v. This inclusion of instruments as arguments of the utility function is difficult to justify by appears necessary for the derived reduced form. In addition it is assumed that the desired value of each instrument is proportional to its actual value in the previous period. The 1st order conditions for a constrained minimum of L then permit each instrument to be written as a linear combination of the targets and its own lagged value. These are the equations which Pissarides estimates. For the period 1965-69 he finds significant relationship between three targets (gold reserves, unemployment and the price index) and 3 instruments (the discretionary tax rate, hire purchase control and bank rate).

The estimated coefficients, or course, are of reduced form equations and hence their values depend both on the structural relationship (the R matrix) and on the weights w and v in the government's loss function. It is therefore not possible to draw any firm inferences about either the structural relationship or the government's preferences. Tests of the efficiency or success of policy are also ruled out, though

Pissarides does attempt to draw some conclusions about the marginal rate at which the authorities are willing to trade off one objective against another. The same objections apply to Fisher's work, which is concerned only with monetary policy instruments. His estimated equations are identical with those of Pissarides; each objective being estimated as a linear function of the policy instruments and its own lagged value. Other than the work discussed above, there is very little published work dealing with the appraisal of U.K. stabilisation policy. A good deal of more thorough and formal work has been carried out in the U.S., of which the Commission on Money & Credit "Stabilisation Policies" and related work is perhaps best known {14}.

There are many reasons to be dissatisfied with the work discussed above. First, in the work of the Musgraves, Dowe, Cohen and Prest there is no explicit modelling either of the structure of the economy or of the government's behaviour. Any conclusions about the success or otherwise of policy, in the absence of these, can only be impressionistic and crude. Pissarides, on the other hand, works with a clearly defined model but his work is open to two objections. First, his government utility function is chosen more for its analytical convenience than because it captures reality. Second, since his estimated equations are only of the reduced form of the system, no direct information is yielded about structural coefficients other than a possible insight into the marginal

preferences of government between different objectives. No measure of success or failure is therefore possible. In none of the work is there an explicit treatment of lags in policy reponse or of lags in the economic structure though there is widespread belief in their importance. Finally, the simultaneity between various instruments (particularly between fiscal and monetary instruments) has not been allowed for.

Clearly what is required to yield some insight into the success or otherwise of macro-economic policy is a model in which both the structural relationships between policy instruments and policy objectives, and the government's behavioural responses, are clearly specified. The difficulty here lies in choosing the appropriate level of generality at which to work. A model in which structural and behavioural relationships are too specific will be very brittle. In the first place such a model will give good empirical results only by chance. Second, it will always be open to another researcher to propose an alternative model which is equally specific and which may well give equally good empirical results. Quite possible too the same reduced form equations will be consistent with more than one hypothesised structural model, making inference ambiguous at best. On the other hand, a model which is too general is unlikely to yield any very rich insights into the problem, if only because it may prove impossible to design an empirical test which is capable of rejecting the model.

A model which might be capable of avoiding these difficulties is Mundell's well-known model of fiscal and monetary policy for an

open economy {15}. The assumptions are so general as to be difficult to challenge. The policy instruments available are fiscal and monetary policy; or, more precisely the budget deficit and the rate of interest. The policy objectives are internal balance (full employment) and external balance (a "satisfactory" balance of payments). Both instruments affect both targets so that there exists a locus of combinations of fiscal and monetary policy are consistent with internal balance, and another locus of combination with external balance, as in Fig. 1. Mundell's contribution was two-fold. First, he pointed out that provided there is any degree of international capital mobility, the external balance schedule EE must slope more steeply than the internal balance schedule. Second, more importantly, he introduced the "principle of effective market classification", which requires that fiscal policy be adjusted to achieve internal balance and monetary policy to achieve external balance. Failure to do this results in instability. Consequently a basic assumption made here is that the government does in fact act according to Mundell's rules. Mundell's model relates to a world in which exchange rates are fixed, relative prices at home and abroad are constant, and a constant interest rate prevails in the rest of the world. These assumptions obviously have not held in recent years, but were at least approximately satisfied for the period 1950-67 which was the period used for estimation purposes.

The attempt to test Mundell's model empirically seems to hold out two possibilities; first, that the parameters of the internal and external balance schedules might be estimatable; second, that it might be possible to establish whether failure to achieve internal and external balance is attributable to unforeseen exogenous disturbances rather than to

the incorrect setting of the levels of the policy instrument. Expressed in formal terms, Mundell's model may be seen as a 4-equation model. The internal and external balance schedules, referred to as the structural relationship, specify the linkages between targets and instruments. Their equations may be written as :

(1) $PSD^*_t = f(BR_t)$ II schedule (Internal balance)

(2) $BR^*_t = g(PSD_t)$ FF schedule (Foreign balance)

where PSD^*_t is the budget deficit consistent with internal balance, and BR^*_t is the interest rate consistent with external balance, and subscripts denote the time period. In order to leave open the question of lags either in the structural relationship or in the policy responses, equations (1) and (2) should be interpreted as referring to long-run equilibrium relationships. The other 2 equations of the system specify the policy behaviour of the government in setting the actual values of the instruments, PSD_t and BR_t. Static equilibrium simply requires

(3) $PSD_t = PSD^*_t$

(4) and $BR_t = BR^*_t$

and solving these 4 equations simultaneously will naturally yield the point of simultaneous internal to external balance. Given perfect foresight and instantaneous adjustment, the policy instruments would at all times be appropriate to achieve this optimal position.

But Mundell's model does far more than define a static equilibrium; it embodies a policy-adjustment rule for convergence to equilibrium. The rule prescribes that the assignment of fiscal policy to internal balance and monetary policy to external balances. Equations (3) and (4) are thus replaced by :-

$$(5) \qquad PSD_t = \Phi(BR_t, \; N_t - \bar{N}) \qquad (6) \qquad BR_1 = \psi(PSD_t, \; B_t - \bar{B})$$

where $N_t - \bar{N}$ is the current excess of unemployment over the target value, and $B_t - \bar{B}$ is the current excess of the balance of payments deficit over its target value. These equations describe the behaviour of the economy in disequilibrium but it is an open question at this stage whether convergence to equilibrium will occur.

MODEL 1; Exogenous shifts in the internal and external balance schedules.

A specific form of the Mundell model which was first examined supposed that the positions of the internal and external balance schedules were influenced by exogenous variables, the effects of which the authorities were capable of predicting; but that the prediction was subject to a random error. The equations of this model are thus :-

$$PSD^* = a_o + a_1 BR + a_2 Z \qquad (1)$$

$$BR^* = b_o + b_1 PSD + b_2 X \qquad (2)$$

$$PSD = PSD^* + u \qquad (3)$$

$$BR = BR^* + v \qquad (4)$$

where X and Z are exogenous, and u and v are disturbance terms.

As before, equations (1) and (2) give the optimal values of the instruments. (Solved simultaneously they give the interesection of the internal and external balance schedules). Equations (3) and (4) specify the behaviour of the government. Combining them gives :-

$$PDS = a_o + a_1 BR + a_2 Z + u \qquad (5)$$

$$BR = b_o + b_1 PSD + b_2 X + v \qquad (6)$$

Equations (5) and (6) form an exactly identified simultaneous system. If the exogenous variables Z and X were known, coefficients a_o, a_1 and b_o, b_1 could be estimates by indirect least squares, which would give us the slope and intercepts of the internal and external balance schedules of Figure 1. (We should not however, learn much about the success of monetary and fiscal policy; we have already assumed, in equations (3) and (4), that policy was optimal except for a random error. All we could learn about policy by estimating equations (5) and (6) would be that, if our estimates of u and v were large, we could infer that policy was subject to a large random error which might point, for example, to poor forecasting).

In order to estimate equations (5) and (6) it was postulated that in equation (5), the internal balance schedule, the exogenous disturbance was private investment (I). The source of exogenous disturbance to the external balance sechedule was taken to be fluctuations in exports (X). (This is open to the objection

that variation in export demand affects both the internal and the external balance schedules). Equations (5) and (6) then become:-

$$PSD = a_o + a_1 BR + a_2 I + u \qquad (7)$$

$$BR = b_o + b_1 PSD + b_2 X + v \qquad (8)$$

an exactly identified simultaneous system whose reduced form (obtained by solving (7) and (8) simultaneously for PSD and BR in terms of I and X) is:-

$$PSD = \alpha_o + \alpha_1 I + \alpha_2 X + u'$$

and

$$BR = \beta_o + \beta_1 I + \beta_2 X + v'$$

where

$$\alpha_o = \frac{a_o + a_1 b_o}{1 - a_1 b_1} \qquad \alpha_1 = \frac{a_2}{1 - a_1 b_1} \qquad \alpha_2 = \frac{a_1 b_2}{1 - a_1 b_1}$$

$$\beta_o = \frac{1 + a_o b_1}{1 - a_1 b_1} \qquad \beta_1 = \frac{b_1 a_2}{1 - a_1 b_1} \qquad \beta_2 = \frac{b_2}{1 - a_1 b_1}$$

Let us repeat that for this model to give satisfactory results, it is necessary, first, that exogeneous variation in I and X do in fact shift the positions of the internal and external balance schedules (in relation to the PSD and BR axes in Fig. 2.). Second, it is necessary that these fluctuations are correctly foreseen by the government (apart from a random error of prediction) and that the levels of PSD and BR are contemporaneously adjusted accordingly. Emphasising these assumptions will perhaps prepare the reader for the news that, when equations (9) and (10) were estimated using 1951-67 annual data, the results were very poor. These poor results then justify the rejection of the hypothesis that fluctuations in unemployment and the balance of payments resulted purely from random errors by the government in predicting, and off-setting, variations in X and I. Faced with these poor results, we can move forward either by modifying the equations which describe the structural relationships between targets, instruments, and exogenous variables or by modifying the equations which describe the policy responses of the authorities, or by modifying both sets of equations.

MODEL 2 : Exogenous shifts in the internal and external balance schedule, together with lagged adjustment of policy instruments.

Taking the second of these alternatives, the assumption was made that policy makers are constrained in the speed with which they can adjust

policy instruments to their optimal values. (The constraints may be partly political, parly economic, and partly administrative). Assuming the usual geometric convergence of actual to optimal value, equations (3) and (4) become:-

$$PSD_t = \lambda PSD_t^* + (1-\lambda)PDS_{t-1} + u_t \qquad (11)$$

$$BR_t = \mu BR_t^* + (1-\mu)BR_{t-1} + v_t \qquad (12)$$

where as before u and v are disturbances, and subscripts denote time periods (taken to be annual). Note that it is not necessary to assume that $0 < \lambda < 1$ and $0 < \mu < 1$. If $\lambda > 1$ and $\mu > 1$ this would imply over-adjustment (leading to cycles) by the authorities. These taken in conjunction with equations (5) and (6) give:-

$$PSD_t = \lambda(a_o + a_1 BR_t + a_2 I_t) + (1-\lambda)PSD_{t-1} + u_t \qquad (13)$$

$$BR_t = \mu(b_o + b_1 PSD_t + b_2 X_t) + (1-\mu)BR_{t-1} + v_t \qquad (14)$$

Although equations (13) and (14) are over-identified it was thought worthwhile to attempt to estimate their reduced forms. The results were:-

$$PSD_t = \underset{(-1.8)}{-1003} \quad \underset{(-1.3)}{-33I} + \underset{(2.1)}{0.60X} + \underset{(1.45)}{0.30PDS_{t-1}} \qquad (R^2 = 0.69) \qquad (15)$$

$$BR_t = \underset{(0.84)}{1.79} + \underset{(0.51)}{0.00046I} + \underset{(0.02)}{0.00002X} + \underset{(1.78)}{0.41BR_{t-1}} \qquad (R^2 = 0.63) \qquad (16)$$

Values of the t-statistic are in brackets. These results are clearly very poor. Despite the over-identification, this model might provide a good description of reality. Exogenous disturbances shift the optimal values of the policy variables; this shift is accurately forecast by the authorities (apart from a random error); but constraints on the speed of adjustment mean that the actual values of the policy instruments are constantly "chasing" the optimum values. It might be argued however that with annual data adjustment should be immediate and this is borne out by the fact that neither of the lagged dependent variables is significant. Nonetheless a third model was estimated in which lagged adjustment of policy instruments was retained.

MODEL 3 No exogenous shifts in internal and external balance schedules, but lagged adjustment of policy instruments.

This model differs from Model 2 above in that the position of the internal and external balance schedules are taken to be static. Their equations are:-

$$PSD_t^* = a_o + a_1 BR_t \qquad (17)$$

$$BR_t^* = b_o + b_1 PSD_t \qquad (18)$$

The policy adjustment equations, as before, are :-

$$PSD_t = \lambda PSD_t^* + (1-\lambda)PSD_{t-1} + u_t \quad (19)$$

$$BR_t = \mu BR_t^* + (1-\mu)BR_{t-1} + v_t \quad (20)$$

implying:

$$PSD_t = \lambda(a_o + a_1 BR_t) + (1-\lambda)PSD_{t-1} + u_t' \quad (21)$$

$$BR_t = \mu(b_o + b_1 PSD_t) + (1-\mu)BR_{t-1} + v_t' \quad (22)$$

Again, as in model 1, we have an exactly identified pair of simultaneous equations, with reduced form :-

$$PSD_t = \alpha_o + \alpha_1 BR_{t-1} + \alpha_2 PSD_{t-1} + u_t' \quad (23)$$

$$BR_t = \beta_o + \beta_1 PSD_{t-1} + \beta_2 BR_{t-1} + v_t' \quad (24)$$

where the α's, β's, u_t' and v_t' depend on the coefficients of 21 and 22), which when estimated gave:-

$$PSD_t = \underset{(0.69)}{166} + \underset{(0.63)}{45}\, BR_{t-1} + \underset{(1.87)}{55}\, PSD_{t-1} \qquad R^2 = 0.47 \quad (25)$$

$$BR_t = \underset{(3.4)}{2.17} + \underset{(2.84)}{0.00128}\, PSD_{t-1} + \underset{(1.58)}{0.3}\, BR_{t-1} \qquad R^2 = 0.73 \quad (26)$$

Equations (21) and (22) were also estimated directly (i.e. ignoring simultaneous equation bias) and gave :-

$$PSD_t = \underset{(0.29)}{93} + \underset{(0.7)}{0.66}\, BR_t + \underset{(1.4)}{0.49}\, PSD_{t-1} \qquad R^2 = 0.47 \quad (27)$$

$$BR_t = \underset{(2.3)}{1.6} + \underset{(1.47)}{0.0011\ PSD_t} + \underset{(2.96)}{0.54\ BR_{t-1}} \quad R^2 = 0.63 \qquad (28)$$

These results are clearly so poor as to decisively reject the hypothesis that lagged adjustment by policy makers, together with a random error, were the only reasons why internal and external balance were not achieved. The results also imply, for example, an absurdly low value for a_1, the slope of the internal balance schedule. From the first equation

$$a_1 = \frac{0.66}{1-0.49} = 1.29,$$

suggesting that a £1.29m. increase in the budget deficit is enough to compensate for a rise in the interest rate of one percentage point.

MODEL 4 incomplete adjustment of policy instruments, with interaction between targets and instruments.

While there is some reason to believe that adjustment of policy instruments to their optimal values may be lagged, an alternative is to suppose that adjustment may be instantaneous but incomplete; a policy rule which may be described as "leaning into the wind". Whereas the lagged adjustment scheme is based on the postulate that the authorities are constrained in the rate at which they can change policy instruments from year to year, incomplete adjustment is implied by the assumption that they are constrained in the levels of the instruments which are feasible, with extreme values ruled out for

achievable only at increasing marginal cost). As an example perfect stabilisation might require the interest rate to vary between 1% and 20% over the cycle, while in practice only the range 5% to 15% is feasible. In this case, given perfect foresight by the authorities, we would expect to observe high interest rates in the presence of a balance of payments deficit, and low interest rates accompanying a surplus. Similar reasoning may be applied to the relationship between unemployment and the budget deficit.

This model may be formalised as follows. Dealing with internal balance first suppose we assume that the internal balance schedule is static, i.e. that :

$$PSD_t^* = a_o + a_1 BR_t \qquad (29)$$

(where PSD_t^* is the optimal level of PSD at time t).

Next we may assume not unreasonably that the deviation of unemployment from its target value, $N_t - \bar{N}$, is proportional to the difference between actual and optimal values of the PSD, plus a stochastic term :

$$N_t - \bar{N} = \gamma(PSD_t^* - PSD_t) + u_t \quad \text{for some constant } \gamma \qquad (30)$$

where $\bar{N}$ is the target level of unemployment (taken in practice to be zero). Dealing with the government's behavioural response, suppose they foresee unemployment perfectly (apart from the stochastic element),

But only seek by adjustment of fiscal policy partially to prevent it. Thus the government's behaviour would be represented by the equation (adding a random element) :-

$$PSD_t = \gamma(N_t - \bar{N}_t) + PSD_{t-1} + v_t \qquad (31)$$

This states that the deficit will be held constant if unemployment in the current period is on target; if unemployment is expected to be excessive, the deficit is increased, but not sufficiently to prevent the unemployment from occurring. Even though the unemployment level which will result, in the absence of intervention, is perfectly foreseen, it may be impossible, because of the constraints discussed above, to prevent it completely.

Equations (29) (30) and (31) combined give :-

$$N_t - \bar{N}_t = \gamma(a_o + a_1 BR_t - PSD_t) + u_t \qquad (32)$$

$$PSD_t = \lambda(N_t - \bar{N}_t) + PSD_{t-1} + v_t \qquad (33)$$

Equations (30) and (31) form a simultaneous subsystem relating observed unemployment and the public sector deficit. BR_t and PSD_{t-1} are the pre-determined variables. By substitution, the reduced form is :-

$$PSD_t = \frac{\lambda\gamma}{1+\lambda\gamma} a_o + \frac{\lambda\gamma}{1+\lambda\gamma} a_1 BR_t + \frac{1}{1-\lambda\gamma} PSD_{t-1} + u'_t \qquad (34)$$

$$N_t - \bar{N}_t = \frac{\gamma}{1+\lambda\gamma} a_o + \frac{\lambda}{1+\lambda\gamma} a_1 BR_t - \frac{\gamma}{1+\lambda\gamma} PSD_{t-1} + v'_t \qquad (35)$$

(where u' and v' depend on a_o, a_1, γ, λ, u and v).

We can thus estimate the parameters of (32) and (33) but applying O.L.S. to (34) and (35), treating the interest rate and the lagged deficit as exogenous variables. As they stand, (32) and (33) are over-identified, since estimating (34) and (35) will furnish 6 reduced-form parameter estimates from which only 4 structural parameters have to be recovered (a_o, a_1, λ and γ). Equation (34) is identical with equation (25) and has already therefore been estimated, with poor results. Estimation of (35) gave:-

$$N_t = \underset{(5.14)}{562} - \underset{(-2.11)}{70.18}\, BR_t + \underset{(2.46)}{0.305}\, PSD_{t-1} \qquad R^2 = 0.30 \qquad (36)$$

These results are clearly so poor as to be of no further use, though it is interesting to note that all the coefficients of the unemplpyment equation are signficant, even though the R^2 is very low. Even if the results had been better, of course, the problem of over-identification would have remained. Moreover, the coefficient on Bank Rate in (36) has the "wrong" sign. From equations (32) to (35) it will be seen that λ, γ and a_1 must all be positive, so that the coefficient on Bank Rate in (33) must be positive too.

Equations (32) and (33) constitute a subsystem of equations in which the public sector deficit and unemployment are functions of the interest rate and theprevious year's public sector deficit. Exactly the

same approach may be applied to the external balance schedule and the policy-makers use of the interest rate. Assume a static external balance schedule with equation

$$BR_t^* = b_o + b_1 PSD_t \qquad (37)$$

Next assume that the deviation of the balance of payments from its target value is proportional to the difference between the actual interest rate and its optimal value, plus a disturbance term :-

$$D_t - \bar{D} = \theta(BR_t^* - BR_t) + w_t \quad \text{for some} \quad \theta > 0 \qquad (38)$$

where $\bar{D}$ is the target balance of payments, taken to be zero. Combining these

$$D_t - \bar{D}_t = \theta(b_o + b_1 PSD_t - BR_t) + w_t \qquad (39)$$

For the policy-making equation, we again assume a policy of "leaning into the wind" :-

$$BR_t = \mu(D_t - \bar{D}_t) + BR_{t-1} + \varepsilon_t \qquad (40)$$

This behavioural assumption may be justified by exactly the same reasoning as was used to justify the fiscal policy equation above; that the authorities seek only to partially off-set deviations of the balance of payments from its target value.

Equations (39) and (40) form a simultaneous system whose reduced form is :-

$$BR_t = \frac{\mu\Theta}{1+\mu\Theta} b_o + \frac{\mu\Theta}{1+\mu\Theta} b_1 \, PSD_t + \frac{1}{1+\mu\Theta} BR_{t-1} + w_t' \qquad (41)$$

$$D_t - \bar{D} = \frac{\Theta}{1+\Theta\mu} + \frac{\Theta}{1+\nu\Theta} b_1 \, PSD_t - \frac{\Theta}{1+\Theta\mu} BR_{t-1} + \varepsilon_t' \qquad (42)$$

Estimation of these two equations by OLS will permit the parameters of (39) and (40) to be recovered. (Once again we have an over-identified system but this difficulty for the moment is ignored).

Equation (41) is identical with (28), and thus has already been estimated. The results were :-

$$BR_t = \underset{(2.32)}{1.6} + \underset{(1.47)}{0.0011} \, PSD_t + \underset{(2.9)}{0.54} \, BR_{t-1} \qquad R^2 = 0.63 \quad (43)$$

The significant coefficient on lagged bank rate perhaps lend some support to our hypothesis of lagged or incomplete adjustment by policy makers. Before estimating (42) it was necessary to choose an appropriate measure of the state of the balance of payments. While other researchers have found a significant relationship between Bank Rate and the level of official reserves, it was felt that total official financing, of which reserve changes form only a part, was a more appropriate measure. Total official financing is equal to (with sign reversed) the total currency flow, which in turn is equal to the current and capital accounts plus the balancing item. We have labelled this variable TCF and treated its target values as zero.

The results of estimating (42) were :-

$$TCF_t = \underset{(5.1)}{660} + \underset{(0.66)}{0.09\ PSD_t} + \underset{(1.45)}{49.5\ BR_{t-1}} \qquad (44)$$

which is clearly totally insignificant. Finally, the two sub-systems - one for fiscal policy and unemployment, the other for monetary policy and the balance of payments may be combined into a 4-equation system. This is achieved by combining (34) (35) (41) and (42) to give 4 equations in which there are 4 endogenous variables - the budget deficit, the interest rate, unemployment and the balance of payments - and 4 exogenous variables, namely the lagged values of these 4. The reduced form of this 4-equation system was estimated, with totally insignificant results.

Model 4 above assumed that the internal and external balance schedules were static and that deviations of the target variables from their target values were explained by an incomplete policy response by the authorities. This model has been rejected by the data but model 5, a modified version, yields more promising results.

MODEL 5 Exogenous shifts in internal and external balance schedules, incompletely neutralised by fiscal and monetary policy.

In this model we assume that the internal and external balance schedules are subject to shifts which affect their intercepts but not their slopes. These shifts are correctly forecast by the authorities (except for a random error) but the authorities are unwilling or unable to wholly offset these by means of policy. Thus for example an upward shift in the internal balance schedule will lead to a contemporaneous

rise in the budget deficit, but by assumption this latter rise is insufficient to prevent the occurrence of some unemployment. This means that the level of unemployment may be treated as a proxy for shifts in the internal balance schedule. Our equation for PSD_t would thus be

$$PSD_t = a_o + a_1 BR_t + \lambda(N_t - \bar{N}) \quad \text{for some} \quad \lambda > o. \tag{45}$$

Thus, $a_o + a_1 BR_t$, in conformity with the Mundell model, gives the value of PSD_t when $N_t = \bar{N}$. When $N_t \gtrless \bar{N}$ we expect to observe $PSD_t \gtrless a_o + a_1 BR_t$. (The value of λ is of no particular significance, except that it is positive). Similarly in setting the interest rate we shall assume that it is adjusted in order to offset, partially but not wholly, shifts in the balance of payments. The equation for BR would then be :

$$BR_t = b_o + b_1 PSD_t + \gamma(B_t - \bar{B}) \quad \text{for some } \gamma > 0 \tag{46}$$

where $b_o + b_1 PSD_t$ is the equation of the external balance schedule of Fig.1.

The advantage of this approach is that we do not need to directly identify the exogenous influences on the internal and external balance schedules. The levels of unemployment and the balance of payments act as proxies for these, granted the assumption that

government policy correctly foresees, but does not attempt to wholly neutralise, changes in unemployment and the balance of payments.

Equations (45) and (46) may be solved for the values of PSD_t and BR_t in terms of N_t and TCF_t, giving the reduced form equation :-

$$PSD_t = \alpha_o + \alpha_1 N_t + \alpha_2 TCF_t + u' \quad (47)$$

$$BR_t = \beta_o + \beta_1 N_t + \beta_2 TCF_t + v' \quad (48)$$

where

$$\alpha_o = \frac{a_o + a_1 b_o}{1 - a_1 b_1} \quad \alpha_2 = \frac{a_1 b_2}{1 - a_1 b_1} \quad \alpha_1 = \frac{a_2}{1 - a_1 b_1}$$

$$\beta_o = \frac{b_o + b_1 a_o}{1 - a_1 b_1} \quad \beta_2 = \frac{b_2}{1 - a_1 b_1} \quad \beta_1 = \frac{a_2 b_1}{1 - a_1 b_1} \quad (49)$$

when these were estimated, the results were :

$$PSD_t = \underset{(-0.74)}{-182} + \underset{(3.1)}{1.87} N_t - \underset{(-4.5)}{0.73} TCF_t \quad (R^2 = 0.68) \quad (50)$$

$$BR_t = \underset{(4.56)}{2.36} + \underset{(3.55)}{0.0049} N_t - \underset{(-2.4)}{0.0019} TCF_t \quad (R^2 = 0.51) \quad (51)$$

The fact that all the slope coefficients were significant was encouraging, though R^2 and $\bar{R}^2$ are low in both cases.

These results were thought sufficiently encouraging to justify recovering

the coefficients of the structural equations (42) and (43). Our main interest is in the slopes of the internal and external balance. From (49), :-

$$a_1 = \frac{\alpha_2}{\beta_2} = \frac{-0.73}{-0.0019} = 384$$

This is the gradient of the internal balance schedule and thus has the a priori correct sign and appears to be of plausible magnitude. It states that the effect of a rise in the interest rate of one percentage point on unemployment may be neutralised by an increase of 384m. in the public sector deficit. Similarly

$$b_1 = \frac{\beta_1}{\alpha_1} = \frac{0.0049}{1.87} = 0.00262$$

since we have written the equation of the external balance schedule as $BR_t = b_o + b_1 PSD_t$ it follows that $\frac{dPSD_t}{dBR_t}$, the slope of the external balance schedule in Figure 1, is given by $\frac{1}{b_1} = \frac{1}{0.0026} = 381$. Thus we have the surprising result that the gradient of the external balance schedule appears to be insignificantly different from that of the internal balance schedule. (To the extent that 384 is regarded as significantly different from 381, our result is "wrong" in the sense that the external balance schedule is <u>less</u> steeply sloped than the internal balance schedule. As noted in Section 1, as long as there is any positive inflow of foreign capital in response to a positive interest differential, the external balance schedule must slope <u>more</u> steeply than the internal).

If these results for the slope of the internal and external balance schedules were taken seriously, we should need to recover the two intercept terms a_o and b_o. If they too were very similar, the two schedules would virtually coincide which would mean that <u>any</u> combination of fiscal and monetary policy which gave internal balance would automatically produce external balance too. On the other hand if the intercepts were significantly different, <u>no</u> combination of fiscal and monetary policy could give internal and external balance simultaneously.

From 5.4

$$a_o = \alpha_o (1-a_1 b_1) - a_1 b_o = -182 (1-1.006) - 384\, b_o$$

$$b_o = \beta_o (1-a_1 b_1) - b_1 a_o = 2.36 (1-1.006) - 0.00262\, a_o$$

solving simultaneously gives $a_o = 0.26$, $b_o = -0.01488$. Since the equation of the external balance schedule is $BR_t = b_o + b_1 PSD_t$, its intercept on the PSD axis is $-\frac{b_o}{b_1}$ which may be recovered as -5.679. Thus the external balance schedule lies well below the internal balance schedule, with almost the same slope (if anything, sloping less steeply), suggesting that any combination of fiscal and monetary policy producing full employment will also produce a balance of payments deficit. This conclusion would appear not inconsistent with the facts !

Qualitative Assessment

Of the 5 models discussed so far, only the last has survived a confrontation with the data. The last model implies that the internal and external balance schedules were parallel, which is only possible if international capital flows are totally insensitive to interest differentials. While we should be aware of rejecting this possibility on a priori grounds, it certainly casts doubt on the validity of the underlying model. Perhaps it is too much to expect that any simple and rather casually-constructed model could capture not only the structural relations between targets and instruments but also the subtleties of policy makers' behaviour.

Nonetheless of the many equations which were estimated, a sufficiently large number of significant coefficients turned up to justify the view that some systematic forces were at work, about which some qualitative if not quantitative inferences might be possible.

In the table all the equations which yielded some significant coefficients are reproduced. Insignificant coefficients in some cases are of interest too, since they eliminatepossible relationships which might be hypothesised. Admittedly these are all "mongrel" equations which are consistent with a variety of possible structural and behavioural equations. Nonetheless, looking at the collected results, certain patterns begin to emerge which can be analysed within the context of the Mundell model.

First, we note that in all equations in which they appear

PSD and BR are positively and significantly associated. Within the Mundell framework this supports the joint hypothesis (a) that conflicts of policy objectives have occurred and (b) that the authorities have implicitly assigned instruments to targets and hence varied the instruments in opposite directions. In terms of Figure 1 we are entitled to deduce that the scatter of observed values of PSD and BR has been positively sloped. (Another point worth noting is that no significant relation appears to exist between the PSD and its own lagged value; while on the other hand lagged BR is frequently significant in explaining the current level of BR. This latter result is somewhat surprising in view of the fact that we are dealing with annual data, while an opportunity to adjust BR occurs every week).

But while PSD and BR have tended to vary positively, and hence to have opposite effects on the target variables, this is only true for a given level of unemployment. A rise in unemployment appears to be associated with greater ease in both fiscal and monetary policy, since the PSD is associated positively, while BR is associated negatively, with N. The regression of BR on N yields a positive coefficient only in one case; that is when TCF is the only other regressor. If lagged BR and the PSD are included as additional regressors, the coefficient of BR on N becomes negative and significant. This suggests that the one exception, when the coefficient of BR on N is positive and significant, results from the omission of these other variables, of which the most important is probably the PSD in view of its positive relation with N. Regressions of N on PSD and BR together yield respectively positive and negative coefficients, reinforcing this view.

The relation between TCF and PSD and BR is less clear cut. Contrary to the implied prediction of the Mundell model, no significant relation exists between BR and TCF, whichever is taken as the dependent variable. The only exception to this rule occurs in the equation of model 5, in which the PSD is omitted as a regressor. This omission appears to have the effect of making the coefficient of BR on TCF negative and significant, suggesting that TCF is merely picking up the influences of PSD on BR.

This is a somewhat surprising result since it contradicts not only the policy prescription of the Mundell model but also one's casual impression that interest rate policy has been oriented primarily to the state of the balance of payments.

A possible explanation is that TCF is not the external balance indicator to which BR is related, either by the response of policy makers or by the underlying economic structure. To investigate this, the relation between the level of gold and convertible currency reserves (GCC) and BR was examined, the main justification being the publicity given to GCC figures and their evident political sensitivity. Here it was found tnat GCC was not significant in explaining BR if N and PSD were also included as regressors, though in their absence a positive and significant relation did exist. This relationship then is no different from that between BR and TCF. On the other hand, taking GCC as the dependent variable, the coefficient on BR was positive and significant even when other variables such as PSD and N figured as

regressors too. One must be sceptical about why this relationship exists, however; GCC is a highly manipulable figure by various window-dressing techniques and may be regarded as partly a target and partly an instrument whereby other targets (e.g. foreign confidence) are influenced.

We are left then with the overall conclusion that N and PSD together with lagged BR, are significant in explaining the level of BR, but that GCC and TCF are not. Low N and high PSD are both factors making for a high BR.

Armed with these general conclusions about the relations between targets and instruments, it is possible using the Mundell model to arrive at some qualitative conclusions both about the existence of exogenous disturbances to the internal and external balance schedules and about the authorities' reaction to these.

First, let us assume that the authorities correctly foresaw exogenous disturbances to the two schedules and that their reaction to them was "correct" in terms of the Mundell rules, though possibly with a lag. Given these assumptions about policy response, there are 5 basic types of exogenous disturbances which may have occurred :-

1. Internal and external balance schedules both tending to shift in the same direction (e.g. as a result of fluctuations in foreign demand for exports). In this case, the intersections of the internal and external balance schedules would tend to be in the ellipse of

Figure 2a. From some "average" positions EE and II, a fall in export demand would shift EE to E'E' and II to I'I', moving the interesection from T to T'. Given this assumption about policy response, this would be associated with a rise in both PSD and BR, which is consistent with the observed positive relation between them. However, given the assumption that the policy adjustments were lagged or incomplete, the shift in the two schedules would also be associated with a rise in N and a fall in TCF (inflow). Yet this contradicts the observed positive relation between these two targets. Hence, given the assumption about policy response, we must reject the hypothesis that exogenous disturbances tended to shift both EE and II in the same direction.

2. A second possibility is that exogenous disturbance shifted EE and II in opposite directions. For example, if a fall in export demand tended to coincide with a rise in investment this would cause the locus of their interesections to lie in the negatively sloped ellipse of Figure 2b. Given the assumption of correct but incomplete policy response, this would cause the shift of the interesection from T to T' to be

accompanied by a fall in TCF (inflow) and a fall in unemployment, which is consistent with the observed positive relation between them. However, the correct policy response in this case (for the movement from T to T' of the interesection) is a reduction in PSD and an increase in BR, which conflicts with the observed positive relation between these two. Hence given the assumption of "correct" direction of policy reponse, we must reject the hypothesis that exogenous factors tended to shift EE and II in opposite directions.

3. A third possibility is that shifts in the internal balance schedule predominated, with EE remaining relatively static. This would give the ellipse of observed values shown in Fig. 2c. In this case shifts in the intersection from T to T' and from T to T'' would be associated with relatively large changes in unemployment while the balance of payments would change relatively little. The observed association between $\dot{N}$ and TCF would therefore be weak or non-existent; while in fact a significant positive association has been observed. In addition, given correct policy response, movements from T to T' and from T to T'' would be associated with relatively large variations in PSD with little variation in TCF, so that the observed relation between these two would be weak or non-existent, yet in fact a significant negative association between these two has been observed.

4. A further possibility is the reverse of the one just discussed; that is that disturbances to the external balance predominated. (This certainly has some intuitive appeal for post-war Britain). This implies the ellipse of observed intersections of II and EE shown in Figure 2d. This case yields the prediction that, as in fact observed, PSD and BR would be positively associated. However, in this case, as in case 3, N and TCF would be only weakly related, if at all; and the same is true of N and BR. Yet in fact these relationships were significant so that we must reject the hypothesis that the main source of disturbance has been to the external balance schedule.

5. A fifth and final possibility is that exogenous disturbance to EE and II have been independent of one another, so that their interesections have been in a circle as in Figure 2e. In this case, given "correct" policy response, no significant association between PSD and BR would be observed, nor between N and TCF. Since both relations have been observed, this hypothesis about exogenous

disturbances must be rejected too.

This exhausts all the logical possibilities for the possible pattern of exogenous disturbances to the EE and II schedules, given that the direction of policy response was correct. This contradiction forces us to reject instead the assumption regarding the policy response. Let us now consider what other types of policy response permit the contradiction to be resolved. For each possible policy response, any one of the 5 possible types of exogenous disturbance could in fact be correct; at first sight a fairly extensive taxonomy would appear to be entailed.

Suppose we continue to assume that policy response was in the right direction, but that instead of a lagged or incomplete response there occurred over-response in the adjustment of one or both instruments. We know that PSD and BR are positively associated, so that the ellipse of observed values has a positive slope. This rules out the possibility that shifts in the internal and external balance schedules have been independent of one another, for in that event the responses of fiscal and monetary policy would also have been independent of one another, provided only that policy responses were in the right direction. However a positive association between PSD and BR is consistent either with EE and II shifting in the same direction, or with EE or II alone

shifting. (Figs. 2a, 2c and 2d). In all three cases the ellipse of observed values o PSD and BR is positively sloped, regardless of whethe policy has over or under responded, provided only tha policy response is in the right direction.

Consider the case of Fig. 3a; exogenous disturbances shifting II and EE in the same dire tion. We have already considered and rejected the case where this pattern of exogenous disturbance was combined with under-resp nse by policy makers. If policy on the other hand tended to over-react, a shift in the intersection from T to T' would lead to an actual movement to a point such as Z, with over-full employment (N low) and a balance of payments surplus (TCF high) yet this conflicts with our observation of a significant positive relation between the two target variables.

If on the other hand policy adjustment tended to overshoot with respect to external balance and undershoot with respect to N, a shift in the intersection from T to T', would be associated with a movement to a point such as X, with excessive unemployment and a balance of payments surplus. A shift in the intersection from T to T" would tend to result in an actual movement to X', with over-full employment and a balance of payments deficit. In both cases N and TCF would thus be positively related, as observed. We thus reach the important conclusion that the observed relationships are consistent with (a) a pattern

of exogenous disturbances in which EE and II tended to move in the same direction (b) a pattern of policy response in which over-response with respect to monetary policy and under-response with respect to fiscal policy tended to occur. This conclusion rests only the assumption (i) of "correct" assignment of instruments to targets in accordance with Mundell's rule and (ii) policy response which was directionally correct in relation to the contemporaneous state of the economy.

This conclusion would also hold if exogenous disturbance had occurred predominantly to either the EE or the II schedule, rather than to both. (Figs. 3b & 3c). In either case over-reaction of monetary policy and under-reaction of fiscal policy leads to a positive association between N and TCF.

Consequently the overall picture which emerges is that, given the empirical results, (i) the II and EE schedules could not have been subject to independent exogenous disturbances (ii) that policy response must have over-reacted to TCF and under-reacted to N. These conclusions rest only on the assumption that the direction of policy response was correct.

The above rationalisation of the observed relationships assumes that the direction of policy response is "correct" in terms of the Mundell model. It thus ignores the troublesome absence of a significant relation between BR and TCF. There is another interpretation of the observed relationships which takes account of this. Suppose exogenous disturbances were independent of one another. We have already seen that in this case, there would be no significant relationship between instruments if they were correctly used. But if fiscal policy is directionally correct, while BR is always adjusted to cancel out part of the effect of fiscal intervention (a kind of schizophrenic policy making), the relationship would be as shown in Figure 4. From an initial position at T, consider an upward shift in II to I'I'. Suppose the authorities react with an increase in PSD, which in itself would have prevented any increase in unemployment. But if this increase in PSD is partly neutralised by an increase in BR, the economy moves from T to T'. Suppose at the same time an independent shift in EE occurs. If EE shifts to the right of T', the movement from T to T' is associated with a fall in TCF; if EE shifts to the left of T', the movement from T to T' is associated with a rise in TCF. Hence no significant relation between BR and TCF will be observed, because none exists. On the other hand, because the shifts in EE are independent of the shifts of II, a rise in N and a fall in PSD will each exercise an independent linear influence on TCF. As observed, a significant relation between TCF and BR will be observed only if these variables are omitted.

Summarising this section, we have shown that the observed facts are consistent with a model in which (a) shifts of EE and II are independent of one another and (b) the PSD is adjusted to compensate partly but not wholly for shifts in the II schedule while (c) BR is adjusted to partly off-set the effects of PSD.

The overall conclusions are thus rather incriminating for policy makers, suggesting either that the use of Bank Rate consistently over-reacted (in both directions) to the requirements of the balance of payments; or, worse, that the sole factor motivating Bank Rate changes was the desire to cancel out partially the effects of contemporaneous changes in the Public Sector Deficit.

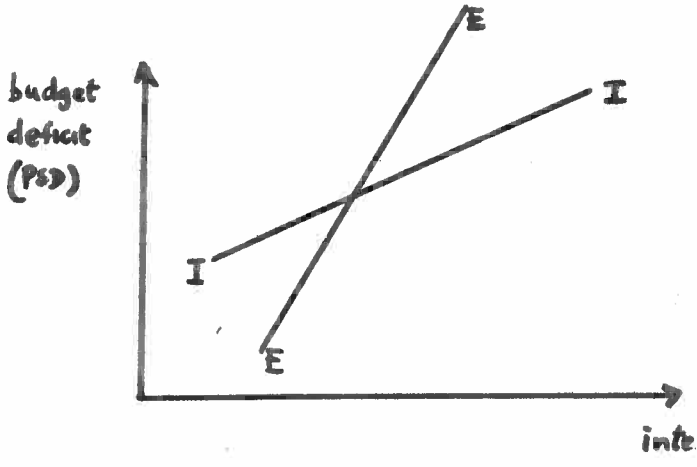

Figure 1

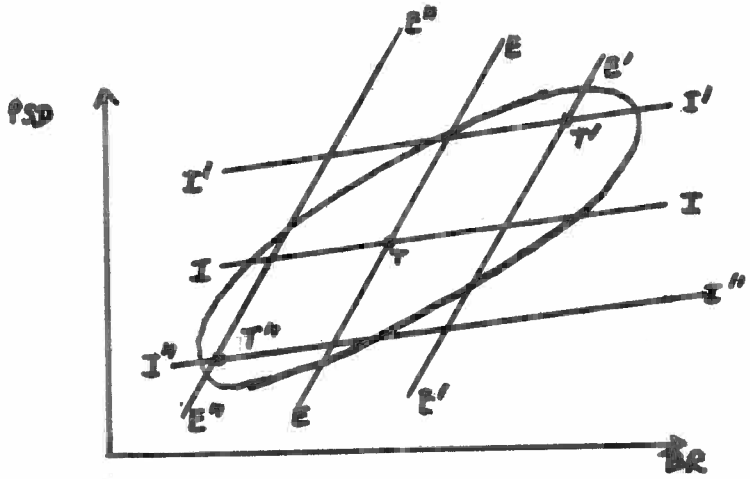

Figure 2(a)

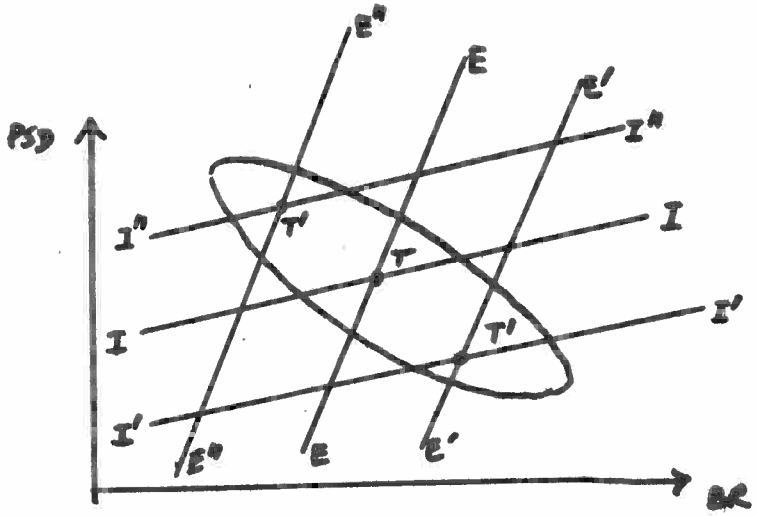

Figure 2(b)

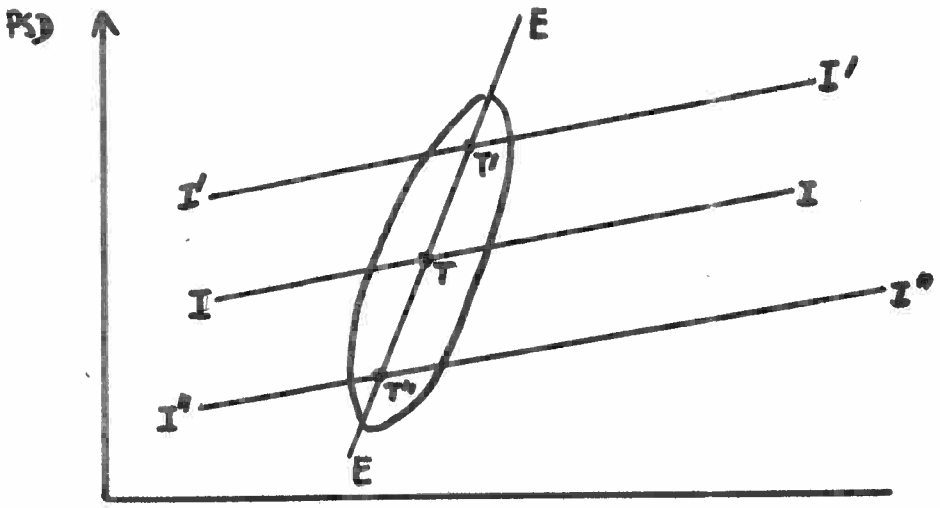

Figure 2(c)

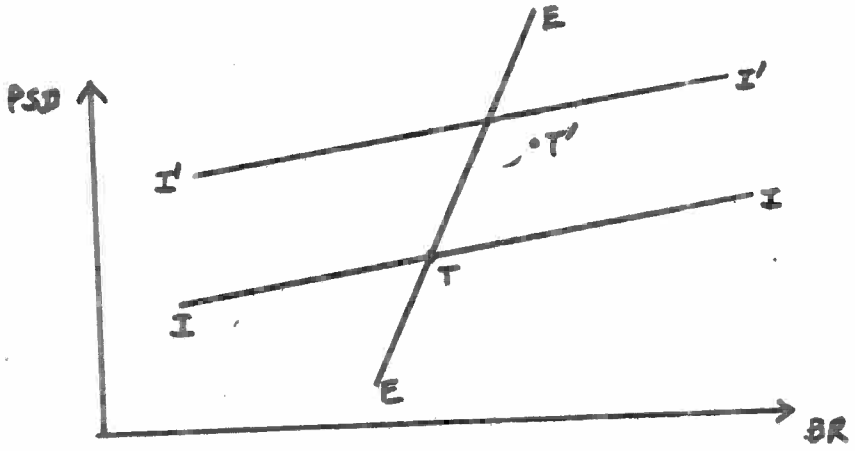

Figure 4

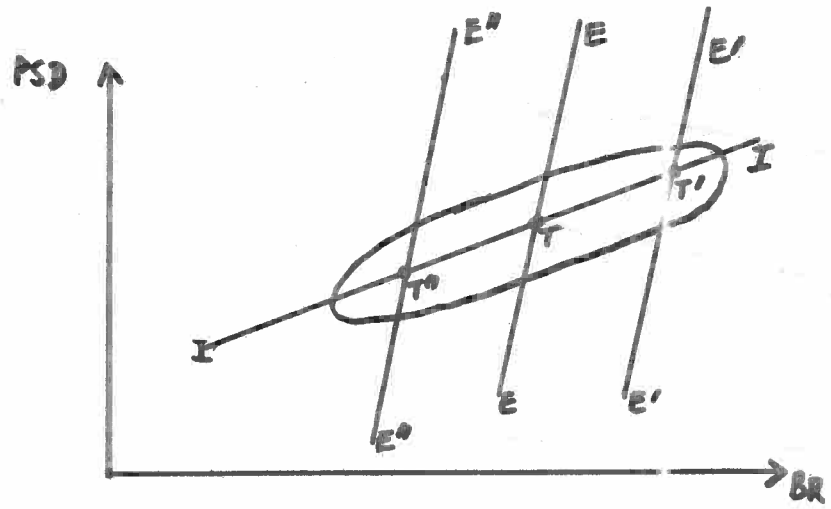

Figure 2 (d)

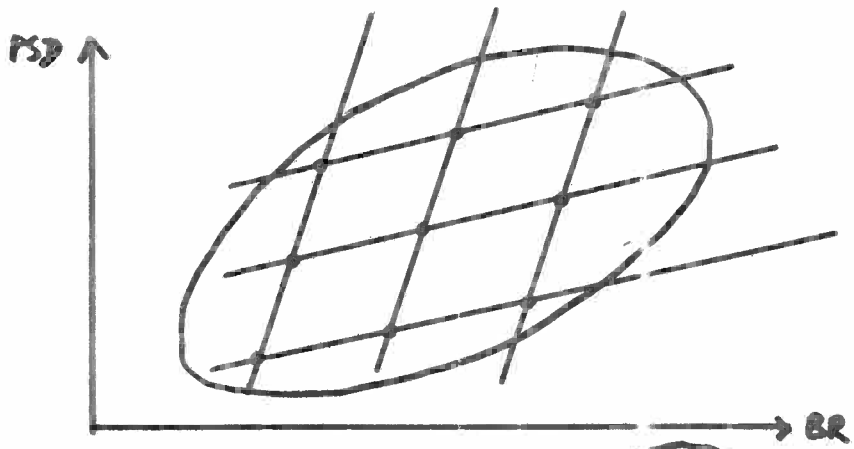

Figure 2 (e)

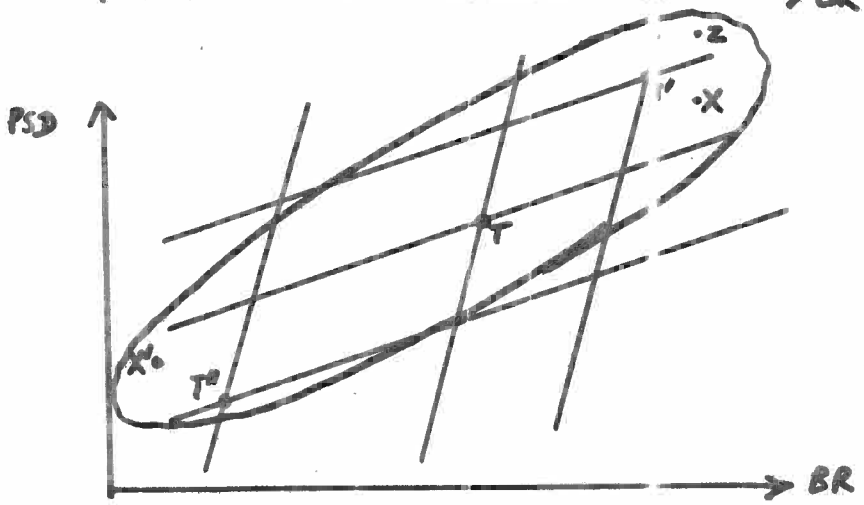

Figure 3 (a)

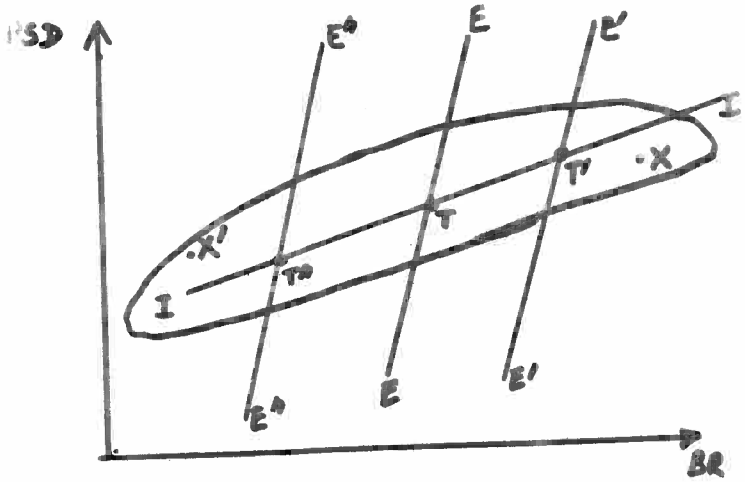

Figure 3 (b)

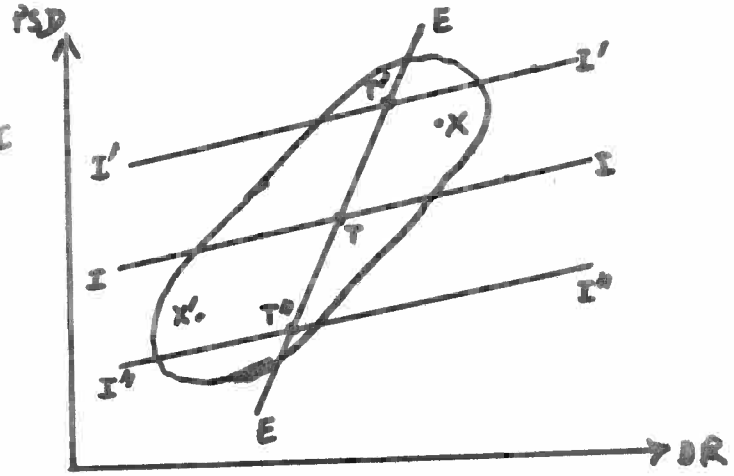

Figure 3 (c)

References

{1} A.W.Phillips, 1954, Stabilisation Policy in a Closed Economy Economic Journal, June.

{2} A.W.Phillips, 1957, Stabilisation Policy and the Time Form of Lagged Responses, Economic Journal, June.

{3} J.C.R. Dow, 1964, The Management of the British Economy 1945-60 (Cambridge).

{4} Richard & Peggy Musgrave, Fiscal Policy, in : R.E. Caves and associates, Britain's Economic Prospects (London, 1968).

{5} W.A.H. Godley & W.A.B. Hopkin, An Analysis of Tax Changes, National Institute Economic Review, May 1965.

{6} Report on Control of Public Expenditure (Chairman, Lord Plowden) CMND 1432 : H.M.S.O. 1961.

{7} J.R.Shepherd & M.J.Surrey, The Short Term Effects of Tax Changes, National Institute Economic Review, November 1968.

{8} J.A.Bristow, Taxation and Income Stabilisation, Economic Journal, June 1968.

{9} A.R.Prest, Sense and Nonsense in Budgetary Policy, Economic Journal, March 1968.

{10} C.D.Cohen, British Economic Policy 1960-69 (London 1971).

{11} G.D.N.Worswick, Fiscal Policy and Stabilisation in Britain; in Sir Alec Cairncross (ed.), Britain's Economic Prospects Reconsidered (London 1971).

{12} D.Fisher, The Instruments of Monetary Policy and the Generalised Trade-off Function for Britain 1955-68; in H.G.Johnson (ed.) Readings in British Monetary Economics (Oxford 1972).

{13} C.A.Pissarides, A Model of British Macroeconomic Policy 1955-69, The Manchester School, September 1972.

{14} Commission on Money and Credit, Stabilisation Policies (E.Cary Brown, ed.) (1963).

{15} R.A.Mundell, The Appropriate Use of Fiscal and Monetary Policy under Fixed Exchange Rates, I.M.F. Staff Papers, March 1962; reprinted in R.A.Mundell, International Economics (London, New York, 1968).