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**MONETARY MODELS AND INFLATION TARGETING
IN EMERGING MARKET ECONOMIES**

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This paper extends and modifies the Keynesian critique of inflation targeting with reference to stabilisation policy in emerging market economies. The IMF 'basic monetary programming framework' for developing countries uses government borrowing and the exchange rate as policy instruments in order to achieve specific inflation and balance of payments targets. This paper first adapts this standard model in order to include short-term capital flows and the floating exchange rate arising from financial liberalisation. In this way, the macroeconomic consequences of the current Fund focus on inflation targeting and the use of a single monetary policy instrument (the interest rate, combined with rigid fiscal and reserve 'rules') in emerging market economies can be demonstrated. Second, the paper encompasses the structuralist critique of the negative effect of inflation targeting on capacity utilisation and trade competitiveness, leading to an argument for counter-cyclical monetary policy in response to external shocks. An alternative model is constructed within a comparable macroeconomic framework to that of the IMF in order to permit the shortcomings of inflation targeting to be rigorously demonstrated. A macroeconomic stabilisation policy based on real exchange rate targeting, bank credit regulation and an active fiscal stance is shown to be more effective in supporting growth and investment.

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1. INTRODUCTION

As Mankiw (2003) points out in a recent survey of monetary economics, while traditional approaches to monetary policy had relied upon transmission to lower inflation through output (and employment) depression through the Phillips curve, this tradeoff seems to have been overcome in advanced economies through labour market reform which have allowed low inflation and low inflation to co-exist.¹ Modern scholars now reach a similar conclusion through a different route - that of independent and unpredictable monetary shocks. In a sense, the modern approach to monetary economics in emerging market economies is similar, although the shocks in question are those of international financial markets on the open developing economy: the exchange rate is thus far more important than textbook monetary theory² would allow. Moreover, the Phillips curve had never been a convincing model of inflation in developing economies due to the extent of disguised unemployment. None the less, the Fund strongly holds the view³ that central bank monetary discretion is inherently inflationary⁴, and thus makes binding monetary rules a condition for official financial assistance to emerging market governments.

The 'new monetary policy' (NMP) is understood to include: a numerical and official inflation target; monetary policy exercised through interest rates; an independent central bank; and no other objectives of monetary policy (Arestis and Sawyer, 2003). The monetary policy rule that generates interest rate responses to inflationary shocks replaces, in effect, the traditional LM curve; while the inter-temporal adjustment of expenditure by representative agents replaces the traditional IS curve. A key feature of the NMP is the reliance on central bank credibility to elicit the required private sector response to official policy. The critique suggests that a nominal anchor will not stabilise output due to the asymmetric effects of interest rates (which act on asset

¹ Inertial inflation remains a theoretical mystery. It is worth noting that there is along tradition of analysing (and coping with) inertial inflation in emerging markets, although this is not discussed in this paper (see Agenor and Montiel, 1999).

² Based implicitly on the US but by implication applicable to the Eurozone if not the UK itself – which is now a 'small open economy'.

³ Only that of 'some economists', according to Mankiw *op. cit.*

⁴ This is of course an *institutional* argument, not an economic one: "monetary policy makers often claim that their aim is price stability, but once expectations are formed they are tempted to renege on this announcement and take advantage of the short-run tradeoff between inflation and unemployment. The only way to avoid this time-inconsistency, it is argues, is to commit the central bank to a policy rule." (*op. cit.* p. 4).

stocks rather than expenditure flows) and that an active fiscal policy should be combined with an active monetary policy, rather than relying upon a single rule-bound instrument. Further, transparency may not have the strong effect on expectations that the NMP assumes it does, while the cost-side of inflation is ignored. Above all, the ‘credit channel’ for monetary transmission should be explicitly considered in any monetary policy model.

This paper extends and modifies this critique with reference to stabilisation policy in small open economies in general and emerging markets in particular. In Section 2, I set out IMF ‘basic monetary programming framework’ – still applied to the low-income developing economies without capital markets – which uses government borrowing and the exchange rate as policy instruments in order to achieve inflation and balance of payments targets. This is done following IMF (1987), which then provides the underlying framework I use in the rest of this paper. I then adapt this standard model in order to include short-term capital flows and the floating exchange rate arising from financial liberalisation. In this way, the macroeconomic consequences of the current IMF focus on inflation targeting and the use of a single monetary policy instrument (the interest rate, combined with rigid fiscal and reserve ‘rules’) in emerging market economies can be demonstrated.

I then encompass the structuralist critique – particularly from Latin America – of the negative effect of inflation targeting on capacity utilisation and trade competitiveness in general, and the need for counter-cyclical monetary policy in response to external shocks in particular in Section 3. An alternative ‘structuralist’ model can be constructed in this way within a similar macroeconomic framework in order to permit a rigorous comparison with IMF inflation targeting. In this way I show that a macroeconomic stabilisation policy based on real exchange rate targeting, bank credit regulation and an active fiscal stance is more effective in supporting growth and investment than either of the IMF models. Section 4 concludes by suggesting that the emerging market critique of inflation targeting is very different to that for industrialised economies, principally because the balance of payments replaces the NAIRU as the principal macroeconomic constraint.

2. THE TWO IMF MODELS OF MONETARY POLICY, MACROECONOMIC STABILISATION AND INFLATION TARGETING

Inflation targeting in the canonical IMF model

The canonical IMF monetary model, derived from an explicitly Keynesian ‘adsorption approach’ pioneered by Polack (1957)⁵ and closely related to the ‘monetary approach to the balance of payments’, has the following form (IMF 1987). This is known as the ‘Basic Monetary Programming Framework’ and has been used since the 1970s at least (when the IMF began to work systematically with developing countries) and is still used widely by IMF missions, although largely for the poorer countries without a domestic capital market or integration to world financial markets (Aghenor, 2000; and Aghenor & Montiel 1999 – especially chapter 13).

This model (following IMF, 1987) is constructed as follows, with four endogenous variables, two targets (reserves - reflecting balance of payments solvency – and inflation) and two policy instruments: the nominal exchange rate and the PSBR. Note that output in real terms (Q) is assumed fixed in the short run, along with exports (X), and that the exchange rate (E) is set and maintained by the central bank.

Exogenous variables: real GDP (Q), exports (X), foreign liabilities (F),
initial price level (P_{-1})

⁵ The current account balance (CAB) is given by the difference between domestic output (Y) and ‘domestic adsorption’ (A) – the sum of private consumption (C), government expenditure (G) and investment (I).

$$Y + M \equiv C + G + I + X$$

$$CAB \equiv X - M \equiv Y - [C + G + I] = Y - A$$

Aggregate *nominal* income (Y) depends on the level of domestic prices (P) and real output (Q); while the resulting ‘peso value’ of the current account balance in dollars (B) depends on the nominal exchange rate (E)

$$B \cdot E \equiv Y - A$$

$$Y \equiv Q \cdot P$$

$$B \equiv (Q \cdot P - A) / E$$

In the ‘adsorption approach’ it is assumed that output (Q) is given in the short run; so that for a given target level of prices (P), the current account (im)balance (B) is controlled *either* by changing the level of nominal adsorption through one of the aggregate expenditure categories (e.g. government expenditure cuts) *or* by varying them all proportionately in real terms through an alteration in the exchange rate (e.g. devaluation). Note that the effect of devaluation is through the *income* effect on aggregate demand, not through *relative prices* as such.

Endogenous variables:	nominal GDP (Y), private domestic financial assets, i.e. bank deposits (B), private domestic liabilities, i.e. bank loans (H), imports (M)
Policy instruments:	nominal exchange rate (E), government domestic liabilities (D) - where a change (\dot{D}) reflects the fiscal deficit financed by bank borrowing (i.e. the PSBR)
Targets:	change in reserves (\dot{R}), inflation (\dot{P})
Parameters:	the inverse-velocity of money circulation (v), credit-demand coefficient (f), nominal import coefficient (m)

There are four national accounting definitions (identities). For nominal income and inflation

$$Y \equiv Q.P \quad [1]$$

$$P \equiv P_{-1} + \dot{P} \quad [2]$$

for the balance of payments on current and capital accounts

$$X - M \equiv \dot{R} - \dot{FL} \quad [3]$$

and the domestic monetary balance

$$ER + B \equiv D + H \quad [4]$$

The behavioural equations (equalities) are as follows. The private sector demand for money (i.e. for deposits in the banking system) is

$$B = vY \quad [5]$$

and the private sector demand for credit from the banking system is

$$H = fY \quad [6]$$

Finally import demand (in local prices) is given by

$$M.E = mY \quad [7]$$

We have seven equations and seven variables to solve for (the five endogenous variables and the two targets) so that Walras' Law is satisfied; we also have two targets and two instruments, so Tinbergen's Principle is also satisfied. The model is thus both consistent and complete.

The two 'reduced form equations' of the model are those for the balance of payments and the monetary balance.⁶ The first is derived by substituting [1], [2] and [7] into [3] in order to yield the change in reserves in terms of one of the instruments (the exchange rate) and the other target variable (inflation)

$$\dot{R} = [X + \dot{F}] - \frac{m}{E}Q[P_{-1} + \dot{P}] \quad [8]$$

the second reduced form equation is found by substituting [1], [5] and [6] into [4] to give inflation as a function of the reserve target and the two policy instruments

$$\dot{P} = \frac{\dot{D} - E\dot{R}}{(v - f)Q} \quad [9]$$

Solving these two equations simultaneously yields the values for the targets (\dot{R} and \dot{P}) at equilibrium in terms of the model parameters, the known values of exogenous variables and the set values of the policy instruments (E , \dot{D}). In principle, therefore,

⁶ It is no coincidence, of course, that these are the major concerns of the IMF and are indeed the categories with most detail in the *International Financial Statistics*.

any desired pair of target values can be achieved by setting appropriate values of the two policy variables.

In practice, the IMF suggests that the exchange rate is most useful in reaching the reserves target, and government borrowing (in other words, the budget deficit) in reaching the inflation target.⁷ If the required policy measures are not feasible (because both real devaluation and budget cuts have severe distributional – and thus political – implications⁸) then it is always possible for the Fund itself to supply extra resources (i.e. increase ΔF) against further policy conditionality...

In relation to a specific inflation *rate* (p) then this can be found by substituting [8] into [9] and:

$$p = \frac{\dot{P}}{P} = \left[\frac{\dot{D} - E(X + \dot{F})}{Y} + m \right] / [v - f] \quad [10]$$

This model can thus be seen as an early form of the IMF inflation targeting (IT) model, but with the PSBR (\dot{D}) as the key policy instrument to achieve this aim.

The transmission mechanism is apparently simple and clear from [10]: clearly a lower PSBR as a share of GDP, or higher exports (or foreign borrowing) will all reduce inflation. However, there are two dimensions that are rather more curious. On the one hand, the exchange rate (E) is set to achieve the balance of payments target, but the higher its level (i.e. the more depreciated) then the less inflation there is. In other words, there is no pass-through – basically because inflation is based on monetary imbalance rather than cost structures. None the less, an increase in the import coefficient (m) through trade liberalisation will raise inflation in this model. On the other hand, and change in the money demand coefficient (v) through expectations – specifically incipient hyperinflation leading to a sharp rise in the velocity of circulation (v^{-1}) – will have a marked impact on inflation.

However, the following characteristics of the model should also be noted:

⁷ See also Dornbusch and Helmers (1988).

⁸ See FitzGerald (1993, chapter 4) for further discussion.

- i. There is the strong implicit assumption that the money supply is endogenous (i.e. bank deposits depend on nominal income) in a Keynesian manner;
- ii. Output is fixed in the short run and not affected by the fiscal stance; although if price stability and excess capacity is assumed, output could become a target variable in the IMF model (Khan et al 1990)⁹;
- iii. There is strong and *explicit* assumption that all private demand for bank loans is to be satisfied, thus avoiding ‘crowding out’ by government borrowing; this can be interpreted as an *implicit* recognition that bank credit does affect output level, and that this should thus be kept at the capacity level.
- iv. There is no role for the interest rate in this model, as is taken to be fixed by the central bank at below the market-clearing rate (the familiar ‘financial repression’ notion inspired by McKinnon) – and thus again there is an implicit credit-rationing process taking place;
- v. And last, but not least, the fact that the exchange rate is a policy instrument implies not only that it is actively administered by the central bank but also that it is supported by capital account controls.

IMF inflation targeting with a floating exchange rate

In the 1990s, of course, the IMF position on exchange rates changed significantly, moving towards an insistence on floating rates. This was accompanied by support for domestic financial liberalisation and the suspension of capital controls in order to stimulate foreign portfolio investment. This meant on the one hand, that the interest rate would become an active policy instrument; and on the other, that the exchange rate would no longer be available as an instrument. The exchange rate would find its own level on a foreign exchange market without central bank intervention.

⁹ Alternatively, growth in the medium term can be seen as the responsibility of the World Bank, which employs its own proprietary model “RMSM” (see Addison 1989, 1999), where there is a savings constraint on investment which in turn implies a strong crowding-out assumption with fiscal deficits reducing growth and increase external assistance raising it. For an endogenous critique, see Easterly (1999).

The exposure of the economy to national and international capital markets also meant that the IMF moved towards a position that the budget deficit should not act as a policy instrument: either because it gave the wrong signals to markets, or because politicians could not be trusted with macroeconomic management. The current position is thus that strict budget balances should be maintained.

In consequence, in terms of the Tinbergen criterion, the policy targets are reduced to one (inflation) and the policy instruments to one (the interest rate). Further it is recommended that this be entrusted to an independent central bank in order to have the desired credibility. This bank should pre-announce the inflation target in order to create appropriate expectations among economic agents; while wages are de-indexed and the labour market itself is made more 'flexible'.

Here I examine this IMF 'new monetary policy' (NMP) model by setting it out in the same framework as the canonical model set out above. The Fund itself has not issued a new primer equivalent to IMF (1987) but the main elements are to be found in textbooks such as Agenor and Montiel (2002).

Exogenous variables:	real GDP (Q), exports (X), initial price level (P_{-1}), and the initial exchange rate (E_{-1})
Endogenous variables:	nominal GDP (Y), private domestic financial assets – bank deposits (B), private domestic liabilities – bank loans (H), nominal exchange rate (E), government domestic liabilities (D), reserves (R), change in foreign liabilities (\dot{F}), imports (M), and the current price level (P)
Policy instruments:	interest rate (i)
Targets:	inflation (\dot{P}) where inflation rate (p) is $p = \dot{P} / P$

Parameters: the demand for money coefficients (v, a), credit-demand coefficients (f, β), nominal import coefficient (m), capital account response coefficient (γ), and the two ‘rules’ coefficients for fiscal deficit and reserves respectively (δ, θ).

Definitions (identities) are as follows: for nominal income and inflation we have, as before

$$Y \equiv Q.P \quad [11]$$

$$P \equiv P_{-1} + \dot{P} \quad [12]$$

for the balance of payments

$$X - M \equiv \dot{R} - \dot{F} \quad [13]$$

and the domestic monetary balance

$$ER + B \equiv D + H \quad [14]$$

The behavioural equations can be modified to include the effect of the interest rate (i) as follows. The private sector demand for money (i.e. for deposits in the banking system) is now

$$B = (v + ai)Y \quad [15]$$

and the private sector demand for credit from the banking system is

$$H = (f - bi)Y \quad [16]$$

Finally import demand (in local prices) is given as before by

$$M.E = mY \quad [17]$$

But now external liabilities (F) are not exogenous, but affected by the interest rate and the change in exchange rates (which we assume to proxy for expectations), so that we can write (risk premium and world interest rates can be seen as reflected in \dot{E})

$$\dot{F} = g\left(i - \frac{E - E_{-1}}{E_{-1}}\right) = g\left(i - \frac{\dot{E}}{E}\right) \quad [18]$$

Two new macroeconomic ‘rules’ are now added which reflect the increasingly constrained nature of IMF policy constraints on developing country governments in the name of ‘sound fundamentals’. First, in pursuance of long-run budgetary stability¹⁰, net borrowing must be limited to a fixed proportion (d) of GDP, such that

$$\dot{D} = IY \quad [19]$$

In other words, there is no independent fiscal policy as a macroeconomic instrument any more. And second, that the central bank does not intervene in the foreign exchange market, leaving the exchange rate (E) to act as an automatic balance. Instead, the central bank maintains a reserve level fixed as a certain proportion of imports.¹¹ We can represent this rule by

$$R = qM \quad [20]$$

With nine variables (eight endogenous and one target) and nine equations, Walras’ Law is satisfied; while with one target (inflation) and one policy instrument (the interest rate) the Tinbergen criterion is met. The model is thus both consistent and complete.

¹⁰ This ratio (d) is of course derived from the familiar budgetary rule required to keep the ratio between debt (D) and income (Y) at a stable ratio (d) for a given long-term GDP growth rate (y)

$$d \geq \frac{D_t}{Y_t} = \frac{D_{t-1} + \Delta D_t}{Y_t} = \frac{D_{t-1}}{Y_{t-1}(1+y)} + \frac{\Delta D_t}{Y_t} = d(1-y) + I$$

$$I = yd$$

¹¹ This could be easily extended to include current account debt service obligations (i.e. international interest charges) as well.

This means that we have again two reduced form equations that can be derived as before by substituting [17], [18] and [20] into [13] in order to yield the balance of payments situation in terms of domestic prices (P), the interest rate (i) and the exchange rate (E)

$$\frac{m}{E}qQ\dot{P} = [Xg(i - \frac{\dot{E}}{E})] - \frac{m}{E}QP \quad [21]$$

The second reduced form equation is found by substituting [15], [16], [19] and [20] into [14] in order to obtain the domestic monetary balance in terms of the same three variables (P , i , E)

$$\frac{EmQ\dot{P}}{E} + (v + ai)\dot{P}Q = (f - bi)\dot{P}Q + lPQ \quad [22]$$

Because of the ‘reserves rule’ [20], rearranging [22] and then dividing through by P in fact yields an expression for the rate of inflation in terms of the interest rate (i) alone

$$p = \frac{l}{m + (v - f) + (a + b)i} \quad [23]$$

This result encapsulates the Fund’s current inflation-targeting regime for emerging market economies. It is combined with binding rules for the PSBR and for the level of foreign reserves to be maintained irrespective of the point in the business cycle – or, more importantly to emerging markets – of the conditions on international financial markets. With the abandonment of capital controls and managed exchange rates, the floating exchange rate is supposed to take care of external adjustment automatically.

The transmission mechanism is clearly modified with respect to the first ‘canonical’ model. The demand and supply of bank deposits is intermediated by the interest rate, which thus serves to moderate domestic monetary imbalances, but it also serves to modify capital inflows and thus achieve the desired balance of payments position. The fiscal deficit is constrained by the inter-temporal budget solvency condition (?) so that an increased interest rate reduces inflation in [23] by stimulating bank deposits and

reducing the demand for credit. Thus the shortcoming of the first Fund model of not including interest rates is apparently overcome; but the assumption of fixed output (or more precisely that the interest rate has no effect on output) now seems even more untenable¹² – particularly because at least in the first model the policy setup ensured that all the credit requirements of the private sector (i.e. producers) were met.

Note, moreover, that an increase in the import coefficient (m) arising from trade liberalisation will also increase inflation and require even higher interest rates in order to restore the economy to its monetary target. The model also implies that financial liberalisation itself will have the effect of increasing inflationary pressures and thus increasing the interest rate required to meet a specific inflation target: specifically, new financial instruments and increased competition between intermediaries will tend to both increase the velocity of circulation of money (i.e. reduce v) and increase the income elasticity of demand for credit (i.e. raise f).

However, the most serious shortcoming of this approach is not clear from [23] itself. From [21] it is evident that the exchange rate must then adjust (i.e. ‘float’) in response to the target inflation rate (p^*) and the corresponding interest rate (i^*), with increased interest rates leading to an appreciation (i.e. reduction) of E . However, of particular interest to us is the *real* exchange rate (e). It is easy to show by substituting [23] back into [21] and rearranging that

$$e = \frac{mQ}{X + g^*} \left[1 + \frac{I(1+q)}{m + (v - f) + (a + b)i^*} \right] \quad [24]$$

In other words, lower inflation targets (p^*) and thus higher interest rates (i^*) not only unambiguously lead to appreciation of the real exchange rate (e) but also that this effect is ‘explosive’.¹³ There will thus be a built-in bias towards over-valuation of the exchange rate (and loss of export competitiveness and thus less growth) from inflation targeting. Further, and even more seriously, external capital market shocks (i.e. sharp

¹² This is a key element of Stiglitz’ critique of Fund programmes which were a condition for international liquidity provision in the Asian crisis of 1997 – see Stiglitz and Greenwald (2003, chapter 13).

¹³ That is, not only $e'(i) < 0$, but also $e''(i) > 0$.

movements in π) arising from shifts in the asset demand schedule¹⁴ on the part of foreign investors have major effects on emerging market macroeconomies.¹⁵ The response to the exchange rate appreciation (i.e. e falling) as the result of a capital surge (i.e. π increases) evident in [24], should be to depreciate the real exchange rate by lowering the interest rate. Instead, maintaining high interest rates will just provoke further inflows and exacerbate the shock. Much the same story obtains for a negative shock (e.g. from contagion), except that the impact on domestic credit supply is even stronger on the downswing.

Moreover, Eichengreen (2003) points out, in practice balance of payments shocks (whether from trade or capital flows) will cause inflation through devaluation but an interest-rate response by the central bank will be ineffective because the imported inflationary effects are very large in comparison to the required demand reduction and the output gap consequences would be far too serious if the real interest rate were really raised sufficiently.

In sum, inflation targeting in emerging economies – even if domestic output were unaffected – is still highly undesirable because it exposes the macroeconomy to exogenous capital account shocks with no feasible means of countering them. This, rather than the employment effect identified in the critique of IT for G7 economies, is the major weakness of the IMF approach even within its own assumptions about macroeconomic behaviour. However, these assumptions themselves – particularly about output determination, fiscal response and central banking – are also unrealistic, as we shall see in the next section.

¹⁴ For the causes of this, see FitzGerald (2003b) and FitzGerald & Krolzig (2003).

¹⁵ For a model of the transmission of these shocks into the emerging market economy via rationed bank lending along Blinder lines, see FitzGerald (2003b).

3. AN ALTERNATIVE STRUCTURALIST (OR ‘PERIPHERAL KEYNESIAN’) APPROACH

The structuralist critique

The central issue in monetary policy for emerging markets is not inflation as such (particularly at the low levels regarded as problematic in industrialised countries) but rather “managing the pro-cyclical effects of externally generated boom-bust cycles” (Ocampo, 2000:1). These external shocks are essentially asymmetric, in the sense that emerging markets are ‘cycle takers’ rather than ‘cycle makers’¹⁶ and they are exacerbated by inherited debt positions. Exchange rates are subject to two conflicting demands: first, the stability of trade, prices and capital flows; and second, the flexibility required in order to adjust current and capital accounts to exogenous changes. Hard pegs serve to anchor the price level but lead to real exchange rate problems and eventually speculative crises. Floating rates lead to instability in domestic prices and expenditure that undermines investment and growth. Moreover, “given the reduced effectiveness of some traditional policy instruments – particularly monetary policy – the exchange rate plays an essential role in helping absorb such shocks” (Ocampo *op. cit.* p. 16).

This ineffectiveness of monetary policy is the result of uncovered interest parity once capital controls are removed and short term capital can move freely.¹⁷ In the upswing of a cycle (the ‘boom’) the interest rate declines and the exchange rate appreciates, but any attempt to counter the boom attracts still more funds and the exchange rate appreciates still further. In the downswing (‘bust’) markets push for devaluation but this forces up interest rates and exacerbates production declines. Underlying this behaviour are a number of structural factors, including: (a) purchasing power parity does not obtain and thus there is no ‘natural’ exchange rate for market expectations to converge upon; (b) the thin and narrow local financial markets reduce the advantages of a free float by failing to provide a buffer for domestic firms; and (c) the dependence of public finances on foreign borrowing makes the fiscal stance

¹⁶ Just as they are price-takers rather than price-makers in international trade.

¹⁷ That is, without intervention, the domestic interest rate will be the sum of the world interest rate plus expected devaluation plus the risk premium (?)

$$i_d = i_d + \dot{E} / E + r$$

automatically pro-cyclical. Thus “generally speaking, authorities have found it difficult to undertake anti-cyclical monetary policies under all [exchange rate] regimes. Broadly speaking, interest rate movements follow the external cycle in all countries. ... True episodes of ‘monetary autonomy’ have been rare, but have been more frequent in Colombia and Chile, the two countries that have used more actively capital account regulation as a complement to exchange rate policy” (*op. cit.* p. 19).

In sum, the structuralist critique is double: on the one hand, that the macro-economy works in a different way from that which the Fund supposes – the role of credit rationing and capacity utilisation being crucial; and on the other hand that multiple policy targets are not only institutionally feasible but socially necessary – rather than relying upon the central bank targeting inflation through the interest rate.

An alternative model for monetary programming

We set up the model in a similar formal framework to the two Fund models discussed above, except that: on the one hand we allow for output (Q) to be below capacity (K), and that this can be adjusted by means of the level of credit to the private sector – in effect this can be seen as reflecting direct intervention via (say) reserve requirements in the traditional manner, or else prudential controls over bank lending in view of maturity or currency mismatch¹⁸; and on the other, we return to multiple targets and thus policy instruments, in recognition of the multidimensional nature of exogenous shocks and the need to reduce the fluctuations in the real exchange rate that undermine investment in the export sector on the other.¹⁹

Exogenous variables: exports (X), production capacity (K), initial price level (P_{-1}), initial exchange rate level (E_{-1}), initial public debt level (D_{-1}), initial reserves level (R_{-1})

¹⁸ See FitzGerald (1999).

¹⁹ For a rigorous case in support of REER targeting in order to limit volatility, see Branson (2001). Joshi (2003) suggests that this must be supported by capital controls, and that the volatility reduction justifies their inevitable efficiency costs.

Endogenous variables: nominal GDP (Y), private domestic financial assets (B), imports (M), change in foreign liabilities (\dot{F}), nominal exchange rate (E), reserves (R), the current price level (P) and change in government debt (\dot{D})

Policy instruments: primary fiscal deficit (Z), private domestic liabilities (H) – i.e. bank lending, and interest rate (i)

Targets: Level of real output (Q) – i.e. capacity utilisation, the real exchange rate (e) – i.e. export competitiveness, and rate of inflation (p)

Parameters: the demand for money coefficients (v, a), credit coefficients (f, β), nominal import coefficient (m), capital account response coefficient (γ), and the ‘rule’ coefficient for reserves (p).

Definitions (identities) are as follows. For nominal income we have, as before

$$Y \equiv Q.P \quad [25]$$

while inflation is

$$p \equiv \{P - P_{-1}\} / P_{-1} \quad [26]$$

and the real exchange rate is

$$e \equiv E / P \quad [27]$$

For the balance of payments on current and capital accounts we have as before

$$X - M \equiv \dot{R} - \dot{F} \quad [28]$$

and the domestic monetary balance

$$ER + B \equiv D + H \quad [29]$$

The behavioural equations have similar forms to previously, but rather different meanings. The private sector demand for money (i.e. for deposits in the banking system) is as before

$$B = (v + ai)Y \quad [30]$$

but the private sector demand for credit from the banking system in [16] is now *inverted* to provide an expression for the effect of controlled bank lending on real output within the limit of capacity (K), this being credit rationing at the macroeconomic level²⁰

$$Q = \frac{H}{P\{\mathbf{f} - \mathbf{b}i\}} \leq K \quad [31]$$

Import demand (in local prices) is given as before by²¹

$$M.E = mY \quad [32]$$

And external liabilities (F) – remembering that risk premium and world interest rates (reflected in $?$) can shift suddenly and this is a frequent and major source of external shocks – are given as before by

$$\dot{F} = g\left(i - \frac{\dot{E}}{E}\right) \quad [33]$$

However, the macroeconomic ‘rules’ are now rather different. First, the long-run importance of debt solvency is maintained; but this now relates to the ‘structural’ budget deficit²², while the deficit in any one year can vary so long as the overall

²⁰ See Blinder (1987) and Bernanke & Blinder (1988), as well as Tobin (1970) of course.

²¹ Ideally, we should allow for the real exchange rate (e) affecting exports (X) – this is not difficult to do but it complicates the exposition unnecessarily as the result only strengthens the results below.

²² As defined by the OECD - see *OECD Historical Statistics 1970-1999* (Paris 2001) for how the period (n) is determined and deviations from the trend are measured.

balance is maintained in the long run.²³ Moreover, the policy instrument itself is the primary deficit (Z) so as to take into account the major effect of interest rates (i) on debt service in emerging economies²⁴:

$$D = Z + (1 + i)D_{-1} \quad [34]$$

In other words, there is an independent fiscal policy as a *short-run* macroeconomic instrument again, although in the long run the debt solvency rule is maintained.

Second, while the central bank does not intervene directly in the foreign exchange market, it does use the interest rate (i.e. intervention in the bond market) to target the real exchange rate. It maintains a reserve level adapted to the short-term external debt position (F) as a form of insurance against external shock – a process usually known as ‘sterilisation’. This means that if capital flows out, reserves can be run down with an expansionary effect on the economy through import provision as another form of counter-cyclical policy.²⁵ We can represent this new rule by

$$R = pF \quad [35]$$

Walras’ Law is satisfied because we have eleven equations and eleven variables (eight endogenous and three targets); while Tinbergen’s criterion is met by the three targets (p , e and Q) and the three instruments (Z , H , and i).

Our *three* reduced form equations are now as follows. The new addition is of course the credit supply function [31], which for notational simplicity we express in terms of real credit to the private sector ($\bar{H} = H / P$)

²³ In effect we are saying that over the whole cycle the original rule must hold, but not within it, as the key aspect of counter-cyclical fiscal policy – see Ocampo (2000).

$$\frac{1}{n} \sum_{t=1}^n \frac{D_t}{Y_t} = I$$

²⁴ See Bacha (1990), which also allows for the effect of the exchange rate on the PSBR through the burden of *external* debt service – an aspect ignored here but which could easily be included.

²⁵ It is notorious that the East Asian economies have been successful in building up large reserves since the 1987 crisis, by running large current account surpluses and paying off the ‘bail out’ loans rapidly; unlike Latin America which remains with low reserves and high short-term indebtedness.

$$Q = \frac{\bar{H}}{f - bi} \quad [36]$$

Note that it is not suggested that this is a growth mechanism as such (which depends on the accumulation of physical and human capital) but rather a means of adjusting output within capacity as a counter-cyclical stabilisation mechanism.

The capital account identity [28] is as before, and is expressed in terms of the exchange rate, interest rates and output by substituting in equations [25], [32], [33] and [35]

$$\begin{aligned} X - M &= \dot{R} - \dot{F} \\ X - \frac{mPQ}{E} &= (p - 1)g(i - \frac{\dot{E}}{E}) \end{aligned} \quad [37]$$

Assuming that the target of stabilising the real exchange rate is in fact achieved (and thus that $\dot{e} = 0$) and plugging in expressions for the real exchange rate [27] and inflation [26], this gives us an expression for the real exchange rate, the second of our targets

$$e = \frac{mQ}{X - g(p - 1)(i - p)} \quad [38]$$

The role of the interest rate is thus essentially to set the real exchange rate: quite different from the IMF's IT model. Note also that if this results in an undesirably high interest rate – in response (say) to a sudden upsurge in capital flows generated by the G3 economies (i.e. a rise in $?$) – then the reserve ratio (p) can be used instead, a process of active central bank intervention usually known as 'sterilisation'.

And finally for the monetary balance, which is related to the inflation process itself. This balance is defined as before from [29], but substituting in [25], [30], [34] and [35] yields a solution for the price level (P) as a function of the other targets and instruments

$$ER + B \equiv D + H$$

$$(v + ai)QP + Ep\{R_{-1} + g(i - \frac{\dot{E}}{E})\} = \{Z + (1 + i)D_{-1}\} + H \quad [38]$$

We can assume that at equilibrium the real exchange rate is stable ($\dot{e} = 0$), that the long run debt ratio rule holds approximately for the domestic debt *stock* ($D = IY$) in order to simplify the result. We continue to write some variables in real terms (e.g. \bar{Z}), and plugging [26] and [27] into [38] gives a solution for the determination of the rate of inflation (p)

$$p = i - \frac{1}{g} \left[\frac{(\bar{Z} + \bar{H}) - Q\{(v + ai) - I(1 + i)\}}{ep} + F_{-1} \right] \quad [38]$$

The transmission mechanism in this model is quite different from those in the Fund model:

- i. First, and most strikingly, higher interest rates actually *increase* inflation due to the resulting increase in the PSBR and the reduction in output as well as the impact on capital flows²⁶;
- ii. Second, given that credit management (H) has already been used to set output (Q) and the interest rate to ensure a competitive real exchange rate (e); so the primary budget deficit (Z) is used for inflation control;
- iii. Third, there is no reason to believe that a primary budget balance (i.e. $Z = 0$) is compatible with low (or even zero) inflation – rather the appropriate balance depends upon the other factors in [38] such as the output and real exchange rate targets on the one hand and particular parameter valued on the other.

In sum, monetary policy in the structuralist model integrates exchange rate management and capacity utilisation into the process of inflation control by using multiple policy instruments – in marked contrast to the Fund approach with a single target and a single instrument.

²⁶ Moreover, a strong structuralist case can be made for interest rates affecting prices through the cost of working capital in production (Taylor, 1988); although in the model discussed in the present paper of course, there is no cost-based pricing function.

4. Conclusions

This paper has extended and modified the critique of ‘new monetary policy’ (in the form of inflation targeting) with reference to stabilisation policy in small open economies in general and emerging markets in particular. The IMF ‘basic monetary programming framework’ uses government borrowing and the exchange rate as policy instruments in order to achieve specific inflation and balance of payments targets.

This paper adapted this standard model in order to include short-term capital flows and the floating exchange rate arising from financial liberalisation. In this way, the macroeconomic consequences of the current Fund focus on inflation targeting and the use of a single monetary policy instrument (the interest rate, combined with rigid fiscal and reserve ‘rules’) in emerging market economies were demonstrated. Second, the paper encompassed the structuralist critique of the negative effect of inflation targeting on capacity utilisation and trade competitiveness, leading to the argument for counter-cyclical monetary policy in response to external shocks. An alternative model was constructed within a comparable macroeconomic framework to that of the IMF in order to permit the shortcomings of inflation targeting to be demonstrated.

The main conclusion of this paper is that a macroeconomic stabilisation policy based on real exchange rate targeting, bank credit regulation and an active fiscal stance is more effective in supporting growth and investment. However, there is also a central institutional issue left unresolved. A central – albeit tacit – objection (by the Fund among others) is that central banks and finance ministries in emerging market economies are simply incapable of constructing an active monetary policy. This incapacity may spring from three sources: (i) lack of technical capacity and/or control over the economy; (ii) particular political or rent-seeking tendencies of governments; or (iii) accumulated crises and incompetencies in the past which undermine credibility. This is not only a rather patronising attitude towards major regional states, but does not allow for substantive learning from past incidents on the part of central banks and finance ministries in emerging markets. One such lesson is that “to avoid credibility issues, and thus guarantee effectiveness, capital account regulation should be in place *throughout* the business cycle” (Ocampo 2000, p. 18).

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