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# Notes on money, debt and alternative monetary regimes for Brazil*

## *Notes sobre dinheiro, dívida e regimes monetários alternativos para o Brasil*

**DEEPAK LAL****

RESUMO: Este texto analisa, com base em um modelo simples, a contribuição de três autores (Rodriguez, Meltzer e Auerheimer) para o debate sobre a inflação no Brasil e as formas de superá-la. Discute-se mais detalhadamente a hipótese da adoção de um regime de *currency board*, como sugerido pelos três autores, e suas implicações para o Brasil. Como alternativa, sugere-se a adoção de um regime monetário inspirado em Hayek, em que há uma competição entre bancos privados pela emissão de moeda.
PALAVRAS-CHAVE: Oferta de moeda; regime monetário; banco central.

ABSTRACT: This note analyzes, based on a simple model, the contribution of three authors (Rodriguez, Meltzer and Auerheimer) to the debate on inflation in Brazil and ways to overcome it. The hypothesis of adopting a currency board regime, as suggested by the three authors, and its implications for Brazil are discussed in more detail. As an alternative, it is suggested to adopt a monetary regime inspired by Hayek, in which there is competition between private banks for the issue of currency.
Keywords: Money supply; monetary regime; central bank.
JEL Classification: E42; E51; E52.

## INTRODUCTION

The purpose of these notes is to provide a commentary on three recent analyses (by Rodriguez, Meltzer and Auerheimer) of the causes and cures for inflation in Brazil. The differing analyses are put into a simple common analytical framework. This allows us to discriminate between their different views of the inflationary process and their prescribed cures. Their common recommendation for the

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** University of California, Los Angeles, USA.

replacement of the Central Bank by a currency board is critically examined, and a suggestion is made for an alternative monetary regime based on competitive currencies issued by private banks.

## I

There are two separate though interlinked issues raised by the three papers. The first is a diagnosis of the causes of the current inflationary process, and hence its cure. The second is the delineation of a new monetary regime which will ensure growth with price stability in the future.

In this section we discuss the former issue.

All three authors agree that the inflationary process is a monetary phenomenon, but there are subtle disagreements among them about the nature of the inflationary process and hence the requisite cures. To show these, consider the following highly simplified model.

Let M be base money; B(t) the stock of nominal interest-bearing government debt at time t, which has a real interest rate of r = i – p, where i is the nominal interest rate and p is the rate of inflation, i.e., if P is the price level, p = (dP/dt)(l/P). Nominal GDP is Y, whose growth rate is y(dY/dt)(l/Y). The growth rate of real GDP, g, from the definitions of y and p is then, g = y – p.

Let the demand for money be of the specific Cagan type:

$$M(t)/P(t) = al - a2\ pe(t) \qquad (1)$$

that is, the demand for real base money depends inversely on the expected rate of inflation. Also, if the real rate of interest is exogenously determined, and there are rational expectations, then expected inflation (pe) will equal actual inflation and the nominal interest rate on any government bonds, i.e., pe = p = i, in which case the money demand function will be a function of i (which is the form assumed in Auerheimer, Appendix B, p. 2). For completeness it should be added that in a growing economy, there should also be another term dependent on y, on the righthand side of (1) which affects money demand positively. Equation (1) is the function Rodriguez estimates econometrically for Brazil and Mexico.

The second crucial relationship common to all three authors (at least implicitly) is the government budget constraint. Let D be the nominal non-interest or "primary" government deficit given by the difference between government expenditures G and tax revenues T, i.e., D= C – T. Then the constraint in nominal terms is:

$$D+ iB = dM/dt + dB/dt \qquad (2)$$

which says that the total government deficit which includes the interest on government debt (the public sector borrowing requirement – PSBR – in UK terminology) will have to be financed by some combination of increased base money and/or bond sales.

Now consider three cases, corresponding to the positions (at least implicit) of the three authors.

(i) The first case is the "monetarist" one, where the government finances the primary deficit D by increased base money (D = dM/dt), and rolls over the interest on its debt by issuing new bonds (that is, iB = dB/dt). In the standard monetarist model, inflation will be determined by the increase in base money, which in tum will be determined by the primary deficit D, that is p = (dM/dt)(l/M) =D/M.

What of the financing of the interest through rolling over debt? That will not have any effect on the inflation rate? To see this, assume that dM/dt = 0, there is no increase in base money, all deficits are financed by bond financing.

Then from the government budget constraint (2), and defining b = B/Y the debt income ratio: d = D/Y the primary deficit to income ratio, and noting that:

$$\dot{b} = d(B/Y)/dt = (dB/dt)(l/Y) - (dY/dt)(l/Y)(B/Y) = (dB/dt)(l/Y) - yb$$
$$= (dB/dt)(l/Y) - (g+p)b \qquad (3)$$

we have from (2) with dM/dt = 0; dividing through by Y, and substituting for (dB/dt)(IN) from (3),

$$d + ib = \dot{b} + (g+p)b \qquad (2a)$$

Dividing through by b, and noting that r = i – p, we get

$$\dot{b}/b = (d/b) + (r-g) \qquad (2b)$$

as the government's budget constraint. For sustainable debt financing, the debt-income ratio must stabilize at some date in the future. That is $\dot{b} = 0$, and hence there will have to be a long run budget surplus (-d) of

$$-d = (r-g)/b \qquad (4)$$

There need to be no inflationary consequences of the internal government debt.

Hence the monetarist diagnosis and cure, is to convert the primary deficit into the surplus determined by (4), which stabilizes the debt ratio, and to limit the growth of the monetary base (dM/dt) which determines the inflation rate (p) to the rate of growth of the real economy (g). This would (given a near unit income elasticity of demand for money) yield a stable price level. This is basically the position argued by Meltzer. His case for a currency board (taken up in a later section) is to provide a credible monetary regime to implement such a policy.

(ii) The second case is based on the "new classical" Sargent-Wallace argument. It has been applied to Brazil by Auerheimer. The government issues both base money and additional bonds to fund its PSBR, that is, its budget constraint is again (2). But now it is assumed that the debt financing is unsustainable in the long run, in the sense that there is no credible policy the requisite budget surplus (given by (4)) to stabilize the debt income ratio. As there is likely to be an upper bound to this ratio – at the extreme given by the total wealth of the country – the government will eventually have to increase base money to finance the persisting deficits (PSBR), and thereby levy the inflation tax to meet its debt obligations. Thus, even current

large increases in interest bearing government debt are inflationary as with rational expectations the public knows that in the future there will be a large increase in base money to finance them. This will influence the current price level. For, assuming perfect foresight (which is equivalent to rational expectations in a non-stochastic world), the money demand equation (1) can be written as:

$$M(t)/P(t) = a1 - a2\ P(t+1)/P(t) \qquad (1)$$

Multiplying both sides by Pt/al yields:

$$P(t) = M(t)/al + (a2/al)P(t+1)$$

$$= M(t)/a1 + (M(t+1)/a1)(a2/a1) + (M(t+2)/a1)(a2/a1)^2 + \ldots$$

$$P(t) = (1/a1) \sum_{k=0}^{\infty} (a2/a1)^k\ M(t+k) \qquad (1a)$$

Thus, future money supply changes affect the current price level. The closer is the value to unity of the ratio of the parameters of the money demand function a2/al, the bigger the effect of future increases in the base money on the price level today. Because from (1), ceteris paribus the greater a2, the more sensitive the current price level is to the expected future price level, and hence to future increases in base money. Also, the higher the expected long run debt-income ratio at which debt is stabilized, the higher the rate of inflation. This can be seen as follows.

From the budget constraint (2), dividing through by Y the nominal GDP, and using the previous definitions of various ratios, as well as (3) we have, where m = dM/M is the growth rate base money, and h = M/Y is the base money-income ratio,

$$d + ib = (dM/M)(M/Y) + \dot{b} + (g+p)b = mh + b + (g+p)b \qquad (2c)$$

To stabilize the debt-income ratio, we must have b = 0, from (2c) this implies that

$$mh = d + (r - g)b \qquad (2d)$$

Assuming that the interest elasticity of money demand is less than unity, any increase in the stable (steady state) debt ratio, b, will lead to a higher rate of growth of base money, m, and hence inflation, p, the inflation tax revenue mh. So, in order to control inflation, we need to stabilize the debt ratio, b. Inflation is thus a "fiscal" problem. Reducing today's money supply will not control inflation, if the debt ratio has not been stabilized, for instance by running budget surpluses (-d) of the size given by setting mh = 0 (in 2(d)). This yields the identical condition to that in the pure bond-financed case given by ( 4). Nor will the mere elimination of the primary deficit be sufficient to control inflation, as is obvious from (2d) by setting d= 0. However, if the primary deficit is eliminated (d=0), and the government at time t, retires the whole of the interest-bearing debt B by exchanging it for base money so that

$$dM/dt = (1+i)B,$$

and thereafter base money only grows at the non-inflationary rate equal to the rate of growth of the real economy, there will only be a once-and-for-all jump in the

price level, with price stability thereafter. This can be seen from (la), assuming a stationary economy (g=0) and hence zero money supply growth required in the future (from t+ 1 on) for stable prices, but with an increase in M(t) by B(l +i), and with M(t+ 1) = M(t+2) = ... = 0, from (la),

$$P(t) = (l/al)(M(t-1)+B(l+i)) = P(t+ 1) = P(t+2) = ... \qquad (1c)$$

The policy recommendations of Auerheimer then flow naturally from this framework. The composition of the total government debt-non-interest-bearing base money and interest-bearing bonds – becomes the central "instrument" of monetary control, with stabilization requiring a credible program of debt liquidation – say through exchanging it for base money, and/or generating the required budget surplus given by (4). While he too recommends a currency board to provide the long run credibility of the stabilization program.

The most important evidence brought in support of this diagnosis as opposed to the "monetarist" one in (i) is that whereas the latter predicts that base money increases will precede price increases, this "new classical" model predicts the opposite, as can be readily seen from (la). In the jargon, in an econometric analysis of the time series for money and prices, the monetarist should find money Grangercausing prices, while on the new classical view prices Grangercause money. (This of course, as Meltzer correctly points out, does not tel1 us anything about causality as we normally understand it.) Rodriguez' Grangercausality tests for Brazil find prices Grangercause money, which is taken to support the "new classical" position. As is Rodriguez's finding of a weak association between changes in the monetary base and prices, but a strong contemporaneous association between government debt and prices.

But the basic story underlying this view of inflation seems implausible, particularly its assumption that the public sees some fixed date for the end of debt finance and assumes that at that date the debt will be retired by levying the inflation tax. However, note, in this framework, besides the policy implication of retiring the existing interest-bearing debt by issuing base money, the other policy prescriptions- generating future budget surpluses to stabilize the debt-income ratio, and of following a rule for the issuance of base money – are the same as in the purely monetarist case.

(iii) The third case is best termed Wicksellian.[1] It is examined by assuming that there is no non-interest-bearing money. Through intermediation of the banking system, the interest-bearing debt of the government- is "money". Assume that all "money" is held in the form of money market funds, whose base is the interest beading debt of the government. Moreover, this debt and hence money is indexed. The relevant base money is then just the existing stock of indexed bonds whose nominal value at time t, is B(t), and hence

[1] As Hicks notes: "Wicksell's model is best understood as a pure credit model: there is no money that is not credit." (p. 61).

$$M(t) = B(T) \qquad (5)$$

Assume that the government has no primary deficit, so that the PSBR consists solely of the interest cost of servicing the debt. The rate of growth of money will then be determined by the rate of growth of the stock of indexed bonds. The government's budget constraint is now

$$iB = dB/dt \qquad (1d)$$

from which the growth rate of bonds $(dB/dt)I/B = iB/B = i$. The rate of growth of money and bonds will be equal to the nominal interest rate. Assuming a stable demand for money, the inflation rate p will then be proportional to the growth rate of bonds = growth rate of money = i. As before, in the monetarist case (i), the budget surplus (-d) required to stabilize the bond-income ratio (b) is given by (4). If this is credibly maintained, the inflation rate should fall to zero, with the nominal interest rate falling to the real interest rate (as $i = r+p$ ).

The empirical evidence and the institutional structure of Brazil's financial system, tends to support this model, in my view. It is pretty close to the system of indexed money that evolved in post-war Hungary, the tax pengo, whose sensational rise and fall is discussed in Bumberger & Makinen (1980, 1983). Except for the extra kick provided by the real interest provided on Brazilian indexed "money", the regime described by Bomberger & Makinen bears a serie resemblance to the Brazilian scene.

Thus, they note: "By June 1946, it was virtually impossible to find regular pengo currency in circulation in Budapest and other cities, especially after 2:00 p.m., the hour the banks closed. Businesses and individuals would deposit practically all their currency in banks and withdraw a scaled up sum the following morning with which to conduct business" (Bomberger & Makinen, 1983, p. 808).

Moreover, from (la) and (5), it is clear that in this case too, price rises will precede increases in money and bonds, that is (as Rodriguez finds) there will be mutual causality between the monetary aggregate encompassing government interest-bearing debt and prices, and that prices will Grangercause this monetary aggregate. This is a much more plausible story of inflation, where the increase in bonds immediately raises current and future (expected) money supplies and hence inflation, than the Auerheimer model, which requires a degree of prescience unlikely to be available to economic agents. Also, unlike his policy implication that the composition of the government's debt (between non-interest-bearing base money and interest bearing government bonds) would influence the inflation rate, Rodriguez's more plausible conclusion is that "repurchasing Federal Debt Titles by printing new money (narrow base) will not change anything of significance insofar as inflation is concerned, as the relevant variable which is the Expanded Monetary Base will remain unchanged" (Rodriguez, 1991, p. 4). Except for one important proviso. If the government were to retire the whole of the current federal debt by printing money then as before the current M(t) would rise by the size of the bond stock $B(t)(1 +i)$, and hence there would be a jump in the current price level P(t). But thereafter, as the government would no longer have to print money to service the

debt, and assuming no primary deficit (d=0), the movement of the price level would again be given by (lc). There would be price stability.

It is in this context that a case for a currency board, as a possible transitional element in the stabilization program can be made.[2] If the new money used to retire the existing interest-bearing debt completely, is 100% foreign currency backed, and issued by an independent currency board (on which more below), there would be credibility that the future time path of M(t) would not be inflationary (assuming rough balance in the country's balance of payments over the medium run). Also, there would be an implicit once-and-for-all capital levy on bondholders, given by difference between the current present value of the stock of debt in dollars to that which will obtain at the new exchange rate between old and new money. To see this assume that the current exchange rate of cruzeiros in terms of dollars is e, so the dollar value of the current stock of government bonds is $B(t) = B(t)/e. Assume that when the new currency board is set up (independent of the government and the Central Bank) it issues the new currency C(t) = F, the foreign exchange reserves (say dollars) the government transfers to it, with the new currency's exchange rate with the dollar being, say, at par. The government then retires the entire federal debt in exchange for this stock of new currency, which is backed 100% by foreign exchange. Hence the value of the new "assets" replacing the old bonds is just $F. The implicit tax (T) on the bondholders (in dollars) is then just

$$T = (B(t)/e) / F \qquad (6)$$

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[2] Under a currency board a country fixes the value of local currency at a fixed exchange rate with a foreign money. The board holds complete (100%) reserve backing in assets denominated in the foreign currency for all the money it issues. It then imports the monetary policy of the foreign country and thus the stability of its own currency depends upon that of the anchor currency. In the past, the Gold Standard provided a stable rule-based anchor for currency boards, which were primarily set up in British colonies. The choice between sterling and the dollar as anchor currencies was based on the predominant trading partner of the colony. The rise of economic nationalism after the Second World War, was a major reason for the demise of currency boards as countries came to identify national sovereignty with the monetary independence provided by local central banks. Two other economic reasons were: first, the demise of the rule-based Gold Standard so that it became more difficult to find a suitable anchor for a currency board. Second, with the growing diversification of trade, it became difficult to identify a particular country as the major trading partner, and hence its currency as the anchor for the currency board. Nevertheless, the two major continuing examples of currency boards viz., in Hong Kong and Singapore, have been fairly successful in comparison with the monetary instability engendered in many other monetarily independent developing countries. However, as Anna Schwartz argues in a concise review of the experience of currency boards, that even in these two cases they seem to be slipping from their classic form because of the "progressive dilution of[the] precommitment... by governments and their constituencies to the discipline these institutions exact" (Schwartz, p. 22). The most recent example of a "quasi" currency board is the pegging of the Argentinean peso in April 1991 to the U.S. dollar. The issue of new pesos requires 100% foreign exchange cover. But as a currency board independent of the central bank has not been appointed to issue the local currency, the move is closer to a de facto dollarization of the economy, where the local paper currency merely substitutes for the holding of dollar notes and coins. While this experiment to date seems to have been successful in reducing inflation and inducing positive capital flows into Argentina, Schwartz is surely right in suggesting that, "the sustainability of the fixed exchange rate with the dollar, is still to be tested" (Schwartz, p. 18).

This tax on bondholders is exactly equivalent to that which would result from a devaluation of the old currency from e to (e + T), in a system where the government debt was unindexed.

Would such an implicit tax on bondholders through an effective devaluation, which is made possible with indexed debt by the institution of the currency board, break faith with the holders of the current government debt? In one sense it clearly would. But as Keynes noted in his Tract on Monetary Reform, while discussing alternative ways of dealing with the unsustainable public debt that had been built up by many European countries after First World War, this might be unavoidable. The post-First World War European debt was unindexed (unlike the Brazilian case), and hence a straightforward devaluation would have led to the requisite reduction.

Keynes identified three methods for:

> ... moderating the claims of the rentier, when the State's contractual liabilities, fixed in terms of money, have reached an excessive proportion of national income. The active and working elements in no community, ancient or modern, will consent to hand over to the rentier or bond-holding class more than a certain proportion of the fruits of their work. When the piled-up debt demands more than tolerable proportion, relief has usually been sought in one or other of two out of three possible methods. The first is repudiation. But, except as the accompaniment of revolution, this method is too crude, too deliberate, and too obvious in its incidence .... The second method is currency depreciation, which becomes devaluation when it is fixed and confirmed by law.
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> ... Its indirect evils are many. Instead of dividing the burden between all classes of wealth owners according to a graduated scale, it throws the whole burden on to the owners of fixed interest-bearing stocks, lets off the entrepreneur capitalist and even enriches him, and hits small savings equally with great fortunes. It follows the line of least resistance, and responsibility cannot be brought home to individuals. It is so to speak, nature's remedy, which comes into silent operation when the body politic has shrunk from curing itself. The remaining, the scientific expedient, the capital levy, has never yet been tried on a large scale; and perhaps never will be. It is the rational, the deliberate method. But it is difficult to explain, and it provokes violent prejudice by coming into conflict with the deep instincts by which love of money protects itself (Keynes, 1923, pp. 54-5).

This sets out the pros and cons of the alternative methods of dealing with unsustainable internal debt, when (see below) the likelihood of the two other gradualist solutions, namely exchanging the debt for equity in newly privatized public enterprises and/or a commitment to generate budget surpluses given by (4) to stabilize the debt at the current debt-income ratio, seem remote. As repudiation or a capital levy would also seem to be politically infeasible, that leaves devaluation through the currency board route outlined above as the only feasible option.

II

But would it be sensible to maintains the currency board as the permanent monetary regime in Brazil? Its major merit would be to depoliticize money – a not insufficient advantage in a polity as fragile as Brazil's. But the major economic disadvantages would be those which usually pertain to a permanently fixed exchange rate regime of the Gold Standard type. This is not the occasion to rehearse familiar arguments for and against fixed versus floating exchange rates. But there are two countervailing aspects which are of relevance in the Brazilian case in making this choice.

The first which argues against a fixed exchange rate regime, relates to differences in the composition of output in resource- and land-abundant countries such as Brazil, and the land-scarce labor-abundant economies such as the two NIC's – Hong Kong and Singapore – which have successfully run monetary regimes based on currency boards. One stylized fact emphasized for instance by Harberger (1988), is that the real exchange rate (the relative price of non-traded to traded goods) is more volatile in Latin-American countries compared with those in East Asia. He argues that the elasticity of demand for a large composite commodity such as tradables should be quite low. This means that equilibrium changes in the real exchange rate (dependent on changes in the domestic price of tradables) will then depend upon the elasticity of supply for tradables. If this elasticity is high, then even large shifts in demand arising from various shocks, or in the normal process of growth, will not entail any large movement in equilibrium tradable good prices and thence the real exchange rate. Conversely if the supply elasticity is low, changing demand will lead to large changes in the real exchange rate. He then argues that the differing resource endowments of land abundant Latin America as compared with labor abundant East Asia, have meant that they have specialized in different commodities which compose their tradable sectors – with the Latin-American tradable output being dominated by low supply elasticity agricultural and mineral products, in contrast to the higher supply elasticities of labor intensive manufactures in tradables output in East Asia. This means that given the inevitable stochastic shifts in the demand and supply for foreign exchange, countries with a higher supply elasticity of tradable output would see little change in their equilibrium exchange rate and would hence not need to effectuate or ease the transition to changing real exchange rates by changes in their nominal exchange rates. By contrast the low supply elasticity countries would either have to accept large changes in their domestic price levels (price of non-traded goods) or else in their nominal exchange rate to effectuate the much larger changes required in their real exchange rates. Unless their domestic money wages and prices are fairly flexible, the ensuing misalignment of real exchange rates, could (with a fixed nominal exchange rate) lead to large "quantity adjustments" in terms of output and employment. For this reason, it would be better for Latin-American countries to have some nominal exchange rate flexibility, to allow smoother adjustments to their unavoidably more volatile equilibrium real exchange rates movements.

For Brazil there is, however, a countervailing argument. As is well-known (see for instance, Corden, 1977) if real wages are rigid, then nominal exchange rate changes will not allow smooth adjustment to required real exchange rate changes, without some quantity adjustments. Now Brazil is a paradigmatic indexed economy, for which the assumption of real wage rigidity was not too unrealistic in the past. Unless the economy is unindexed, therefore, nominal exchange rate changes will not be able to effectuate the equilibrium real exchange rate. ln which cases the question of exchange rate flexibility (once the price level is stabilized) becomes moot. Brazil may as well then accept the monetary discipline associated with a currency board, as well as the unavoidable adjustments in output and employment that the equally unavoidable volatility of its real exchange rate will entail.

But this situation is not ideal. It would be much better to un-index the economy, and adopt some variant of exchange rate flexibility, which means that the currency board is unlikely to be the ideal permanent monetary regime for Brazil, whatever its attractions as a transitional measure to deal with the internal debt overhang and the resulting inflationary process.

## III

This brings us to the central question concerning Brazilian stabilization and the choice of its long-term monetary regime – the political economy of Brazilian post-war economic development. I have argued elsewhere (Lal & Myint; Lal & Maxfield) that the central feature of Brazil's political economy which it shares with other land-abundant countries not ruled by Platonic Guardians, is its propensity to indulge in periodic "Big Pushes". These are financed by a mixture of foreign borrowing, internal borrowing and the inflation tax. Each "push" leads to a crisis, with hyperinflation, a balance of payments and a foreign debt crisis. Once this is resolved – usually by the adoption of what is termed the "orthodox" stabilization program – the polity reverts once again to its bad old ways. The current Brazilian crisis can be seen in this context as the end play of the Netto Big Push of the 1970s. Once the current crisis is resolved there is little reason to believe that there will not be another Big Push and another cycle of growth with instability. Can this be prevented, and would a currency board in particular, be able to prevent the monetary madness associated with past Big Pushes in Brazil?

This raises the question of who will run the new currency board. Even if it is initially established as an independent agency, having been created by government fiat it could, over the long run, be as easily converted into a creature of the government – with, for instance, first, a slide from 100% foreign backing, and then to using government bonds as backing for the currency! If it is to function as its supporters envisage, it would have to be run by those who could not be subverted by

the Brazilian state. An obvious answer is for the IMF to run the currency board[3], but given nationalist sentiments is this likely to be acceptable? Possibly, if the hyperinflationary crisis – which is ultimately a crisis of the State – cannot be resolved in any other way. Here the experience of the inter-war European hyperinflations in similarly weak States overburdened by internal debt and weak fiscal systems, is instructive (see Bresciani-Turroni, 1937, and Sargent, 1982). Apart from creating a new currency, it was the fiscal adjustment overseen by international overseers – usually from the League of Nations – which provided the essential credibility for the reforms. However, it is difficult to see the Brazilians accepting such foreign fiscal and monetary governors!

By contrast, a transitional currency board engaging in the retirement of the internal debt outlined above, would seem to be in the interest of the State, as it would resolve its current crisis. But what could be done in the lone run to prevent the Brazilian State from following its worst instincts?

## IV

This is where the ideas associated with the recent revival! of the case for free banking begun by Hayek (1976), and argued by others (see Dowd, 1989, Selgin, 1988, Smith, 1936, and Verbal, 1987) might be worth considering. It is beyond the scope of these notes to go into the ongoing debate about the merits and demerits of the case for free banking or denationalizing money as Hayek terms it. (For critiques see Goodhart, 1988, Friedman & Schwartz, 1986, also see Dorn & Schwartz (eds.), 1987, and Hall (ed.), 1982).

But there are two different strands in the new proposals which need to be distinguished. In the historical cases of free banking, e.g., in Scotland, the banks used a common monetary standard – that is, the outsold money into which privately issued bank notes (or deposits) were convertible.

Hayek's suggestion is for a more radical departure – namely competition for privately issued currencies denominated in different units of account.

In the Brazilian case it might be best to start with a free banking system based on a common monetary standard, as for instance in Scotland in the 19th century. With the establishment of the currency board in the initial transitional period, its notes would provide the common monetary standard, and the common outside money of the free banking system. The details of the system as it might evolve are best set out in Dowd (1989), who also deals with many of the common objections and worries (for instance those expressed in Goodhart, 1988. Also see the Fall 1989 issue of the *Cato Journal*, particularly the articles by White & Selgin).

With free banking initially based on the currency board money as outside

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[3] But as Schwartz has noted, "the IMF from its foundation has championed the role of a discretionary central bank as essential to sovereignty" (p.22). So, it is doubtful if the IMF would agree to play this role.

money, any attempt by the State to debase it, would lead to the competitive issue of parallel private monies- because of Gresham's Law in reverse as Hayek has termed it.[4] This possibility would be particularly strengthened if, as they should, branches of foreign banks are also allowed to issue their own notes. There would then be competitive pressures to provide alternative outside monies for the system. Some of these may be based on some composite standard of the price indices of primary commodities as envisaged by Hayek. Stability in the value of such currencies would also provide the necessary flexibility to accommodate the volatility of real exchange rates arising from the preponderance of low supply elasticity goods (e.g., agricultural and mineral goods) in tradable output. Though more work needs to be done to work out its modus vivendi in the Brazilian context, the free banking proposal as an alternative long run monetary regime, initially superimposed on a currency board system, and then perhaps superseding it into a system of privately issued competing currencies, might be an attractive one for Brazil. Given the sophistication of its existing private financial system it certainly has the skills to implement the scheme. While if it catches on, by depoliticizing and decentralizing the issuance of money, it might succeed in abolishing monetary policy – the bane of the Brazilian economy!

## V. CONCLUSIONS

Even though it may be difficult to get agreement on which of the three models of the inflationary process is relevant for Brazil, there are some common prescriptions which are relevant in devising a contingent stabilization plan.

The first step is to have a clear target for the budget deficit (surplus), so that, over a short period of time the requisite budget balance (required on all three approaches) is achieved. The size of the long run budget surplus on all three approaches is given by equation (4).

The second step (at least implicit) in all three approaches is in effect to un-index the economy. Using a currency board as a transitional measure to retire the existing indexed government debt, can be seen as a means of effectively de-indexing the financial system. If the currently available foreign exchange reserves are insufficient to retire the stock of government debt at par at the existing exchange rate, an implicit tax on bondholders is unavoidable.

The third step is to devise a new monetary constitution which will deliver

[4] Gresham 's Law stated that there was a tendency for bad money to derive out good money. But as Hayek notes: "Gresham 's Law will apply only to different kinds of money between which a fixed rate of exchange is enforced by law. If the law makes two kinds of money perfect substitutes for the payment of debts and forces creditors to accept a coin of smaller content of gold in the place of one with a larger content, debtors will, of course, pay only in the former and find a more profitable use for the substance of the latter. With variable exchange rates, however, the inferior quality money would be valued at a lower rate and, particularly if it threatened to fall further in value, people would try to get rid of it as quickly as possible" (Hayek, p. 35).

monetary stability. This should take account both of Brazil 's economic and political comparative advantage!

Whether the currency board should be a permanent part of the Brazilian monetary system is however dubious. This is largely due to the production structure of the economy being dominated by tradable goods with relatively low supply elasticities. As this is likely to imply large changes in real exchange rates when adjusting to various shocks. Some flexibility in the nominal exchange rate would temper the "quantity" adjustments that sluggish movements in the requisite domestic price level may otherwise entail. But as the Brazilian state has used the monetary independence provided by central banking to persistently debauch the nationalized currency, depoliticization of money – a hope held out by a currency board – still remains essential for future monetary stability. ln this context a radically new monetary constitution which allows free banking on the lines suggested by Hayek and others might be worth considering.

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