A Note on Monetary and Non-Monetary Analyses of LDCs Balance of Payments Problems

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Although balance of payments problems have been pervasive in the developing economies, there is little agreement amongst economists as to the causes and the cures for these problems. This paper focuses upon two models of the balance of payments: the two-gap model and the monetary approach to the balance of payments (MAEP). The two-gap model describes the chronic excess demand for foreign exchange in the developing economies as structural in origin, and implies that monetary cures for it do not seem to be relevant. MAEP, on the other hand, describes balance of payments deficits as reflecting disequilibrium in the money market and hence must be treated as a monetary phenomenon, requiring the use of tools and concepts of monetary theory. Balance of payments disequilibrium involves an inflow or outflow of international money, and the behaviour of monetary authorities is regarded as crucial to any sensible study of the balance of payments.

The analysis of these two models presented in this paper tries to reveal their underlying structures and emphasizes the differences in their approach to the balance of payments problems. After providing brief expositions of the two models in the following two sections, we discuss the importance of the assumptions in each of the model. Next, we present a synthesis by relating to the two-gap model some aspects of the monetary approach. This has not been done before in the literature. This attempt at a synthesis raises certain issues, some of which are answered in this paper. For instance, we are able to provide a reasonable explanation of why the LDC governments engage in excessive credit creation, leading to balance of payments deficits and then devaluation.

THE TWO-GAP MODEL

This section develops a two-gap model. In national income accounting, an excess of investment over domestic saving is equivalent to a surplus of

*The author is a Graduate student in Department of Economics, Princeton University. He is indebted to Professors W. Arthur Lewis, William Branson, William Baumol, Willem Buiter, Jonathan Eaton, and fellow student, Jeff Carmichael, for helpful comments. Professor David Folkerts-Landau, his faculty adviser, deserves special mention for useful comments and encouragement in the writing of this paper. Errors are authors' own responsibility.

imports over exports (for the moment we ignore government expenditures and revenues).

Income	=	Consumption	+	Imports	+	Saving
Output	=	Consumption	+	Exports	+	Investment
Income	=	Output				
Saving	—	Investment	=	Exports	—	Imports

In accounting terms, the amount of foreign borrowing (foreign assistance) required to supplement domestic savings is the same whether the funds are needed for more resources for capital formation, to fill a savings-investment (S-I) gap, or for imports, to fill the export-import (X-M) gap. The *ex-post* identity between the two gaps follows from the accounting procedures: an excess of imports over exports implies an excess of resources used by an economy over resources supplied by it, or an excess of investment over saving. The two-gap analysis argues that although the (X-M) and (I-S) gaps are always equal *ex-post*, there is no reason why they should always be equal *ex-ante*. Furthermore, when the two gaps are not equal and the (X-M) gap is the binding constraint, then the marginal product of additional domestic savings from the point of view of transmitting it to foreign exchange earnings is zero. This is because economic growth is limited by the foreign exchange bottleneck, and resources are not being fully employed.

The two-gap models are built around two basic assumptions. First, there is an absolute limit to the extent by which domestically produced goods can be transformed into imports; there are limits to the policies of import substitution and/or export expansion. Second, the production process is such that domestic and imported goods are required in more or less fixed proportions [5, pp. 679-732; 6, pp.77-89; 15, 16, pp. 388-419]. Consider a simple fixed coefficient production function of the Leontief type.

$$\overset{o}{Q}(t) = \min\left(\overset{o}{K}_d(t)/B_d \,,\; \overset{o}{K}_m(t)/B_m\right) \qquad \text{where}$$

$B_d \,,\; B_m > 0$

Q(t) is domestic output; $\overset{o}{K}_d$ and $\overset{o}{K}_m$ are initial domestically produced and foreign produced capital goods. To keep the model as simple as possible, the likely bottleneck of skilled labour is ignored by assuming a Lewis type labour surplus economy. If the constraints K_d and K_m are simultaneously binding (no excess capacity exists), then

$$\overset{o}{K}_d(t) = B_d \overset{o}{Q}(t) \quad \text{and} \quad \overset{o}{K}_m = B_m \overset{o}{Q}(t)$$

These two equations give the total investment requirements: the sum of investment in domestic capital goods and in imported capital goods.

$$\overset{o}{I} = \Delta\overset{o}{K}_d(t) + \Delta\overset{o}{K}_m(t) = (B_d + B_m)\,\Delta\overset{o}{Q}(t)$$

Maximum possible saving [S*(t)] is assumed proportional to output.

$$S^*(t) = s\overset{o}{Q}(t) \geqslant \overset{o}{S}(t)$$

It is assumed that a minimum level of imports [M*(t)] is required for capital formation, with no imports for consumption. Actual imports should be greater than or equal to this minimum.

$$M^{o}(t) \geqq M^{*}(t) = K^{o}_{m}(t)$$

Imports are assumed to be necessary to avoid under-utilization of existing resources and the frustration of the growth potential. The import requirements include maintenance imports necessary to keep existing capacity fully utilized, as well as imports of capital goods for the expansion of industries. This requirement constitutes a factor-proportion problem due to the complementarity of domestic and imported inputs; there is no substitutability between domestic factors and the imported inputs.

Maximum possible exports [E*(t)] are assumed to be a proportion, e, of the domestic product, and actual exports are smaller than or equal to this maximum.

$$E(t) = eQ^{o}(t) \geqslant E^{o}(t)$$

It has been argued that the export maximum is due to the poor export prospects of developing countries in regard to both primary and manufactured exports. There are limitations of demand on the part of the developed countries for the primary products the developing countries typically supply. Exports of manufactured products from the LDCs do not hold promise because "goods in demand in advanced countries are atypical for the economic structure of developing countries" [15, p.12].

Now suppose the government plans to expand output by $\Delta Q^{o}(t) = A$; $Q^{1}(t) = Q^{o}(t) + A$. The projected ΔK^{o}_{d} requirement is $I^{o}_{d} = B_{d} A$ and ΔK^{o}_{m} requirement is $I^{o}_{m} = B_{m} A$. Given the rigidities of the model, we at once notice the problem. With one of the investment levels exogenously constrained, the two gaps need not be equal *ex-ante*. Let there be a limit on imports due to insufficient foreign aid (F) ; $X+F = M$, *ex-post*. The government cannot attain the growth target, A, by expanding I_{d} through government policy. The increased expenditure on domestic capital goods will only create excess capacity due to the strict complementarity of domestic and imported inputs.

The non-binding character of the constraints (underutilization of resources) and the inability of the domestic authorities to break the foreign exchange bottleneck are the major policy conclusions of the two-gap models. When the savings-investment gap is the binding constraint, then both domestic capacity and import capacity can be fully employed. This is because imports can be employed in production of consumer and investment goods, and, in addition, some consumer and investment goods can also be directly imported. However, when the export-import gap is the binding constraint, then there will be unutilized domestic capacity. Domestic inputs must be complemented by

imports to produce final product, whereas imports not only complement domestic inputs but can provide final product directly. This assymmetry between imports and domestic capacity is fundamental to the two-gap models.

THE MONETARY APPROACH TO THE BALANCE OF PAYMENTS

The two-gap models view the chronic excess demand for foreign exchange in developing economies as a structural, non-monetary phenomenon. Therefore, monetary cures for the disequilibrium in the foreign exchange market are irrelevant. The source of trouble is that export capacity cannot satisfy the growth requirements for imports, which are assumed to be in fixed proportion to output. Disequilibrium in the foreign exchange market is an attribute of economic development, a result of technologically imposed lags in the development of exports and substitutes for imports. Money plays no role in this discussion of the balance of payments. This view is in sharp contrast to the MABP, and we now turn to examine this "alternative" model. After providing a brief exposition of the MABP in this section, we discuss the importance of the assumptions in this model.

MABP uses the money-supply process and the money-demand function as the central theoretical relationships around which to organize its analysis of the balance of payments [10, 13]. In the framework of the monetary approach, the balance of payments position of a country is considered to be a reflection of decisions of the residents to accumulate or to run down their stock of money balances. Deficits and surpluses in the balance of payments are a result of this process of adjustment to the desired stock of money balances. Thus, MABP sees the chronic excess demand for foreign exchange in the LDCs as a product of policies that repress financial markets and generate excess supplies of money. According to the MABP argues that the balance of payments is the prime means by which the private sector in an open economy adjusts money supply to money demand under fixed exchange rates.

We can explain the excess demand for money and hence the balance of payments by the determinants of the supply of and demand for money. By Walras Law, one could instead examine the excess demands of the items above the line in balance of payments accounting, goods and services and securities. MABP argues that it is simpler and less likely to produce error to concentrate on the monetary account. "The basic rationale for this principle of organization is that we are interested in the behaviour of the money account for which the demand for and supply of money should be of prime importance. The same principle would apply if we were interested in the steel account: we would organize the analysis around the demand for and supply of steel" [17, pp.187-222].

The assertion that it is better to organize the analysis of the balance of payments about the money account rests on an "empirical judgment" that the demand for money is a stable function of variables which are not affected or are affected in a predictable way by the changes in prices, output and the balance of payments. But with three markets (goods and services, money, and securities), it is not clear that the general equilibrium values of the money-demand determinants (income, price level, and interest rate) will behave in easily predictable way [8,19]. Two important arguments were developed in the MABP literature to eliminate this uncertainty: price flexibility and the long run neutrality of

money; and the law of one price. There are more and less extreme views, but the dominant assumptions in the MABP literature are the exogeneity of domestic output and prices.

MABP makes the level of real income exogenous to the system by assuming the classical world in which all prices are flexible and real output is constant at the full employment level. "Whereas the Keynesian model assumes that employment and output are variable . . . the monetary models assume that output and employment tend to full employment levels with reaction to changes taking the form of wage and price adjustments" [13, pp. 154-55]. The law of one price comes from the assumption of perfect commodity arbitrage; in the absence of barriers to trade, the prices of goods must be the same in all markets. By assuming perfect substitutability and fixed relative commodity prices, advocates of MABP apply the law of one price to a single-commodity world and translate it into a "law of one price level." MABP acknowledges the presence of transportation costs, tariffs and nontariff barriers, etc., but treats them as a constant factor of proportionality which can be assumed away. This aggregation into the "law of one price level" abstracts from changes in the relative prices of exports and imports, the country's terms of trade. Relative prices are assigned no role or a purely transitory one, and price levels of the countries move rigidly in line. Prices of traded goods are held together because there is substitutability among products and arbitrage, or even the threat of arbitrage, keeps prices uniform. The prices of nontraded goods are kept in line by substitutability between traded and nontraded consumption goods and among inputs in production [14, 19].

The law of one price level and the exogenously given income level give the MABP great simplicity and power. If prices and output are given, then any changes in domestic supply of money can only find an outlet in the balance of payments. For a small country which has prices and income given and which adheres to a fixed exchange rate, the money supply is completely endogenous and there is a one to one relationship between money supply increases and reserve losses. In such a world, balance of payments theory, analysis, and policy prescription must necessarily include exact specification of domestic monetary policy. MABP further argues "that international money flows are a consequence of stock disequilibria—differences between desired and actual stocks of international money—and as such are inherently transitory and self-correcting" [12]. The nonzero official settlements balance changes the money stock until the demand for and supply of money are equalized, and when the money market is in equilibrium, the balance will not be changing.

MONETARY ASPECTS OF THE TWO-GAP MODELS

There are then two explanations of the excess demand for foreign exchange in the LDCs. The two models stress different aspects of the balance of payments, and are more like ships that pass each other in the night than ships that collide head on. According to the two-gap models, excess demand for foreign exchange is structural in origin. It is a result of technologically imposed lags in the development of exports and substitutes for imports. Growth requirements for imports are proportionate to output and the "maximum" exports cannot satisfy the demand for "minimum" imports; the export capacity cannot meet

the growth requirements for imports. These models, without monetary variables, assume structural rigidities in the economy and assume financial variables to be unimportant.

The MABP describes the excess demand for foreign exchange as an entirely monetary phenomenon. The balance of payments position of a country is considered to be a reflection of decisions of residents to accumulate or to run down their stock of money balances. Furthermore, by assuming given price and income levels, MABP is able to equiate balance of payments disequilibrium to money market disequilibrium. Here, unlike the two-gap models, monetary cures for balance of payments problems are all important. There can only be a continuous balance of payments deficit if there is a continuous increase in credit. "The remedy for a deficit seems simple and obvious when put in this way: stop creating credit. Stop attempting to increase the supply of money faster than the demand for it is increasing" [7, p. 36]. In the MABP world of wage-price flexibility and no structural rigidities, the link between monetary changes and balance of payments deficit is presented as a way of stopping the deficit painlessly, as well as with reasonable certainty. Presumably then the only reason why the domestic authorities do not follow the prescription is because they are naive.

The two-gap models, together with the evidence (or assertion) that the import-export gap is the binding constraint, are ingeniously well designed to provide a case for foreign aid. At the same time they can give policy makers a sense of helplessness regarding what they can do when foreign aid is not available. Indeed, criticisms have been directed at the basic assumptions of the two-gap models [3, pp. 439-446]. If policy makers are assumed to have no control over the demand for foreign exchange, and the investment mix is given, then there is little they can do to break the bottlenecks which may arise. Bruton (1969) has argued that it should be possible for the government to affect the usage of foreign exchange by pricing public goods which have a heavy import content, or by taxing the domestic consumption of exportables, or by choosing an appropriate commercial policy. Furthermore, even when the export-import gap is the binding constraint, the "extra" domestic saving need not be "wasted". Investment in education, health, technical research and similar areas does not require much imported physical capital. The production functions in the LDCs need not be as rigid as the two-gap models in their extreme versions would have us believe.

SYNTHESIS OF THE TWO APPROACHES

These criticisms are important and should be incorporated in the two-gap approach. It is useful to disaggregate the consumption and production functions, according to the possibilities of substitution. The addition of this flexibility widens the applicability of two-gap models. They become more than mere arguments for foreign aid. They help the policymakers in identifying sectors where there is low substitution and where a potential bottleneck may arise, and suggest what steps the domestic authorities may take in order to avoid the bottleneck and the under-utilization of resources. However, there have not been any attempts to include monetary variables and policies within the framework of the two-gap approach.

Let us go back to the equation which illustrated the two-gap problem, and incorporate into it the government deficit, (G T). Given the fragmented capital markets in the developing economies, we assume without much loss that the government deficit is financed entirely by credit creation, that is, (G—T) $= \Delta D$

$$I_d = B_m A - \overset{\circ}{X} + \overset{\circ}{S} - (\overset{\circ}{G} - \overset{\circ}{T})$$

For the given growth target and due to the strict complementarity between domestic and foreign imports, the required imports are $B_m A$. However, given the exports and foreign aid, we are only able to get $B^*A < B_m A$ of imports, resulting in under-utilization of domestic investment.

In order to prevent excess capacity, the policymakers attempt to divert domestic investment into government consumption *via* budget deficits.[1] This helps to explain the near universal use in the developing countries of direct controls over various variables, especially prices and private investment. The domestic government authorities have to ensure that the investment they are diverting is what would otherwise become excess capacity, and the "extra" domestic saving is not "wasted". But is this the end of the story? We notice that in order to divert the investment, the government has to increase its budget deficit, which is financed by credit creation. The domestic component of the money supply is increased, and we can now tell the MABP story. However, it is not the simple one to one relationship between domestic credit increases and reserve losses.

We are here considering a developing economy with segmented capital markets that are not connected to the international financial markets, and where the domestic authorities have strict controls over imports and only the essential capital goods are imported. The MABP assertion of the law of one price levels and the immediate exchange of excessive money for imports of securities and/or goods does not hold. But it is still the case that people will not hold more money than they want, and the excess supply of money will be spent on domestic goods, both non-tradeables and exportables. This will raise the price of non-tradeables and, depending on what assumption we make, either raise or leave unchanged the price of exportables. A rise in the price of exports will reduce foreign demand, unless we have the unlikely, perfectly inelastic foreign demand curve. The supply of exports will also decline as the domestic demand for exportables increases. Moreover, if we make the small country assumption (the price of tradeable goods is determined even in the short run as the product of the exchange rate and the foreign price of tradeable goods), then there will be a relative price effect which further reduces the supply of exports. The price of exportables has remained unchanged and the price of non-tradeables has increased, inducing a shift in production away from exportables and in favour of non-tradeables. With a maintained level of imports and foreign aid, the reduction in exports is matched by a corresponding reserve loss ($\Delta R = X - M + F$).

[1]The government consumption may include the expenditures which Bruton has recommended; *i.e.*, investment in education, health, technical research and similar areas which does not require imported physical capital.

It seems that in a roundabout way we have derived from a structural model the MABP result: increases in the domestic component of the money supply cause corresponding reserve losses. We wish to emphasize, that unlike MABP we did not assume exogenously given income and price levels. By making these assumptions, MABP ignores important policy problems. It is true that the nature nd speed of the international transmission mechanism is of great importance for the conduct of economic policy. Nevertheless, if changes in the money stock are reflected in changes in money income and affect real output first and the price level only with a substantial lag, then an argument can be made for using monetary policy as an instrument for promoting employment and economic growth. LDC governments engage in deficit finance not because they are naive and don't understand MABP, but rather because they face structural rigidities, excess capacity, and other problems which the MABP assumes away. Furthermore, not all the increase in the domestic component of the money supply is matched by declining reserves. Significant nontradeable sectors and barriers to international trade in the LDCs means that part of the money supply increase takes the form of domestic inflation, causing a reduction in the real balances held. Part of the credit expansion is absorbed by the economy in order to maintain the equilibrium level of real balances. Despite the long run implications of the MABP, even a fairly small country can exercise short run control over its money supply for stabilization or other purposes, as long as the trend in the money supply is consistent with long run requirements. Moreover, the long run loss of control over the money supply can be avoided by even a small, nonreserve country either by adopting floating exchange rates or *via* a strategy of repeated re- or devaluations.

It is frequently argued in the MABP literature that a devaluation provides no lasting remedy for a balance of payments deficit unless the growth rate of domestic credit is cut. The argument is that by raising domestic prices a devaluation creates a temporary excess demand for money which is met by an inflow of reserves. But once the excess demand is satisfied (stock equilibrium is achieved), then the balance of payments will return to its normal value determined by the growth of domestic credit relative to the growth of demand for high-powered money. But a policy of periodic devaluations in which reserves are built up just after one devaluation, to be drawn down before the next, is a viable if not a universal approach among developing countries which maintain parties. It is an alternative to floating exchange rates and makes it possible for the monetary authorities to exercise control over the money supply [2, pp. 69-89; 8, p.16].[2]

CONCLUSIONS

In conclusion of this paper, emphasis is placed on the issues raised by the present exposition of the monetary and non-monetary modles of the balance of

[2]While in the long run it is useful to view the exchange rate as the relative price of national outputs, in the short run it is more useful to view the exchange rate as the relative price of national monies. Markets for output—for goods and services—a just slowly relative to asset markets. The exchange rate is determined, along with interest rates, in the short-run equilibration process of financial markets, given supplies of domestic and foreign assets. Since the Marshall-Lerner condition does not hold in the short run, the foreign exchange markets should be unstable. But if there are internationally integrated financial markets, then stabilizing speculation (speculators know that in long run the Marshall-Lerner condition holds) cause portfolio adjustments that makes the Marshall-Lerner condition hold even in the short run, and thus yield stable foreign exchange markets. Flexible exchange rates are not feasible for most LDCs because of their segmented capital markets. In the absence of private international capital markets, the central bank has to make the market for foreign exchange by maintaining parties.

payments. The monetary and non-monetary models make different simplifying assumptions and focus on different problems, and as such are not alternative models. It is pointless to argue that one model is better than the other statements like the following may be misleading:

". . . analysis of the balance of payments only makes sense in an explicitly monetary model, and, in this sense, the balance of payments is an essentially monetary phenomenon . . . analysis of the balance of payments is in a theoretical framework where money is not explicitly present is, prima facie, nonsense" [13].

This paper in its exposition of the two-gap models has shown that models without monetary variables can be useful in policy formulation. It is true that when there is a deficit in the official settlements balance, then domestic authorities are purchasing domestic money for foreign exchange in order to maintain the exchange rate. That there is an excess supply of domestic money, and the application of the tools and concepts of monetary theory would be helpful. But the monetary approach to the balance of payments has much less relevance, than would be supposed from reading the sweeping conclusions at the end of a typical MABP article. MABP makes a number of simplifying assumptions, and certain important problems are ignored (assumed away). Thus, structural models are needed for the balance of payments analysis—the two approaches complement, rather than substitue, one another. Two-gap analysis is useful as a description of an existing condition of structural disequilibrium in the LDCs. It focuses on the probable limits to accelerated growth and attempts to determine actual policy alternatives for the developing economies. It helps the policy-makers in identifying sectors where there is low substitution and where a potential bottleneck may arise, and suggests what steps the domestic authorities may take in order to avoid the bottleneck and the underutilization of resources. MABP has made a contribution by bringing to our attention the importance of the international adjustment mechanisms for the conduct of economic policy. The effectiveness of monetary policy depends crucially on whether money "spills out" directly and rapidly through the capital account in the balance of payments, and on the strength of the current-account effects of changes in the relative price of traded and non-traded goods. Structural models help explain why in the short run it may indeed be optimal for a country to engage in "excessive" deficit finance, and monetary models help explain the long run implications of such policies. Monetary and non-monetary models have added to the stock of knowledge in economics and there is enough room in the economists' tool kits to include both.

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