The Basic Framework of the Monetary Approach to the Balance of Payments

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Both the elasticity approach of Beckerdike-Marshall-Lerner-Robinson-Metzler and the absorption approach of Alexander were seriously challenged, in the mid-1960's, by the dissidents who were led by Robert A. Mundell and Harry G. Johnson. The latter emphasized the balance of payments being a monetary phenomenon. This fundamental thesis, however, is often misunderstood even by recent studies. This paper will attempt to clarify the basic framework of the monetary approach to the balance of payments. Although not a small number of contributions appeared in the last decade[1], including unique survey articles of Johnson [3], Mussa [6], Kemp [4], Whitman [9], and Swoboda [8], we shall focus attention solely on essential aspects of the monetary approach and refrain from policy evaluations.

In the following, Section 1 provides an overview of the monetary ap-

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1) Frenkel and Johnson [2] collects earlier important contributions.

proach. In this discussion, the importance of the country's budget constraint is emphasized. In Section 2, we use a simple model to show the importance of the role of monetary adjustment for the analysis of the balance of payments. In Section 3, we present a more general basis for the approach. By so doing we can easily extend the basic analysis, presented in Section 2, in order to derive meaningful policy implications.

I The Monetary Approach: An Overview

The Monetary Approach to the balance of payments begins with the budget constraint of a country. This states the identity relation between the sources of income and the uses of income. This flow constraint can be seen clearly from the T-account **Table 1.** In this table note that (A) includes interest payments to the domestic holders of domestic assets. The budget constraint is

$$(A) + (B) + (C) \equiv (a) + (b) + (c) + (d).$$

Using the following definitions

$(A) - (a) \equiv$ trade balance surplus

$(B) - (b) \equiv$ capital account surplus

$(C) - (c) \equiv$ (capital) service account surplus

$(A) - (a) + (C) - (c) \equiv$ current account surplus,

it is clear that the overall balance of payments surplus *identically* equals hoarding, i.e.,

(balance of payments surplus)

$\equiv$(current account surplus)+(capital account surplus)

$\equiv$(hoarding).

It follows that the balance of payments is essentially a monetary phe-

nomenon. The monetary approach focuses on the determinants of the domestic excess demand for or supply of money in flow terms (i.e., hoarding or dishoarding). Thus, it takes into account some behavioural relationships directly relevant to the money account, based upon the assumption that the demand for money is a stable function of a few nominal and real variables.

Table 1

Sources of Income	Uses of Income
(A) income from domestic production	(a) purchases of goods and services
(B) sales of financial assets	(b) purchases of financial assets
(C) interest income from holding foreign assets	(c) interest payments to foreign holders of domestic assets
	(d) hoarding (increase in money holding)

Consequently, the monetary approach in its simplest form indicates that a balance of payments surplus (deficit) measures the rate at which money balances are being accumulated (decumulated) by domestic residents. As such, any deficit or surplus reflects the difference between the actual and desired levels of money balances. For example, a balance of payments deficit implies dishoarding activity of the residents. The international adjustment mechanism in this system is nothing but a constant effort to bring actual money balances to their desired levels. Under a fixed exchange rate regime the equilibrium between the two is achieved by automatic inflows or outflows of international reserves or through some deliberate action by the domestic monetary authorities. This automaticity of adjustment process emphasised by

the monetary approach can easily be traced back to David Hume's price specie flow mechanism.

During the Keynesian era, a mass of unemployment and wage and price inflexibility were assumed and an automatic adjustment was considered to be irrelevant. As a result, an improvement in the balance of trade was treated basically as a policy issue. More specifically, due to the lack of a price mechanism, devaluation was *assumed* to change the real prices of domestic goods relative to those of foreign goods. A substitution away from the consumption of foreign goods and towards domestic goods by both domestic residents and foreigners would occur thereby inducing an increase in exports and a decrease in imports for the devaluating country. All these movements would finally result in an improvement in the balance of trade. The effectiveness of devaluation through changes in the relative prices was however subject to the Marshall-Lerner condition.

As Johnson put it "the elasticity approach to devaluation proved demonstrably unsatisfactory[2] in the immediate post-war period of full and overfull employment owing to its implicit assumption of the existence of unemployed resources that could be mobilized to produce the additional exports and import substitutes required to satisfy a favorable impact effect." (Johnson [3, p. 232]). The absorption approach, as

2) Two majour arguments have been advanced against the elasticity approach. First, Mussa [7] states that what this approach lacks is a treatment of the exchange rate as a relative price of real commodities rather than the relative price of currencies. Though a change in the exchange rates may sometimes lead to a change in the relative commodity prices, the devaluation will not achieve the desired aims unless the money demand responds to changes in the exchange rates. Secondly, the elasticity approach fails to incorporate the effects of asset stocks and thus ignores the fact that flows of funds occur to restore equilibrium and are not the determinants of equilibrium.

contrary to the elasticity approach, analyzed the effects of devaluation on the balance of trade via its effects on aggregate absorption and income. It asserted that devaluation in a fully employed economy may lead to a rise in prices which would in turn deflate the value of the money stock. This would lead to a reduction in aggregate spending and hence an improvement in the balance of trade. With unemployment, a devaluation would increase the consumption of domestically-produced goods both at home and abroad. Income would thus rise due to the working of the multiplier. Expenditures too increase due to the increase in income but as the marginal propensity to spend is less than unity, the increase in the aggregate expenditure is less than the rise in aggregate income, thus leading to an improvement in the trade balance.

The basic relationship between the balance of payments and the other macro-economic aggregates, income and expenditures emphasized by the absorption approach, was retained by the monetary approach[3]. As is shown by the identity, balance of payments≡hoarding, the accumulation or decumulation of assets depends on the aggregate relationship between domestic expenditure and income and not on the composition of that expenditure, as was assumed by the elasticity approach. Though relative prices do influence the composition of expenditure, their role is secondary and could be neglected. But the general price and income levels have a key role in that they determine the real value of financial assets and also the demand for these assets.

Given our identity relation, a positive relation between the balance

3) We must note, however, that the fundamental equation for the absorption approach, (trade balance surplus)=(income)− (absorption), is an *equilibrium* condition, rather than an identity, for the domestic goods market. Thus, it would be restricted to the equilibrium analysis.

of payments surplus and economic growth, for example, can be postulated on the grounds that the income elasticity of demand for money is positive. This however contradicts the traditional assertion that any increase in income would, by increasing imports, deteriorate the balance of payments. Apparently, the latter is not compatible with our recent experience and its fallacy is due to its failure to utilize the budget constraint.

II A Skeleton Model

For the clarity of exposition of the fundamental issues, this section develops a skeleton model of the monetary approach to the balance of payments[4]. It is a two-country, one-commodity, two-asset (home and foreign currencies), fixed exchange rate, full-employment model. The following notation will be used throughout the present section:

L : desired nominal money balances

M : nominal quantity of money

D : domestic component of the domestic money supply

R : international component of the domestic money supply

B : trade balance surplus, measured in domestic currency

Z : desired nominal expenditure on the aggregate good

H : flow demand for money (hoarding)

p : money price of the aggregate good, measured in domestic currency

e : exchange rate (domestic currency price of foreign exchange)

y : output of the aggregate good

k : desired ratio of money balances to income

4) The basic model of this section was developed by Dornbush [1].

b : rate of adjustment of actual to desired money balances.

An asterisk indicates foreign-country variables.

(Stock) demands for money are assumed to take the form

$$L = kpy, \quad L^* = k^*p^*y^*, \tag{1}$$

where the Marshallian k (k*), and y (y*) are constants. The (stock) supplies of money are given by

$$M \equiv D + R, \quad M^* \equiv D^* + R^*. \tag{2}$$

The excess flow demands for money are

$$H = b(L - M), \quad H^* = b^*(L^* - M^*). \tag{3}$$

Since we ignore the existence of non-money financial assets, the budget constraint is given by

$$py \equiv Z + H, \quad p^*y^* \equiv Z^* + H^*. \tag{4}$$

Given specification (3) of the hoarding function, the desired expenditure on goods will be a residual. That is,

$$Z = py - b(L - M), \quad Z^* = p^*y^* - b^*(L^* - M^*). \tag{5}$$

Assuming arbitrage equilibrium in the world market for goods, domestic prices in two countries are uniquely connected by the fixed exchange rate,

$$p = ep^*. \tag{6}$$

Moreover, let us assume that the goods market is always in equilibrium. For this *flow equilibrium*, world demand for and supply of goods must always be balanced. If we express this equilibrium condition in terms of home currency, it will be

$$(Z + eZ^*) - (py + ep^*y^*) = 0. \tag{7}$$

By using (4), (7) is equivalent to

$$H + eH^* = 0 \text{ [: flow equilibrium condition]}. \tag{8}$$

By definition, the balance of trade surplus, B, of the home country is

$$B \equiv H \equiv -eH^*. \tag{9}$$

However, the balance of trade surplus results in an increase in the foreign reserve in the next period. Combined with the assumption that D and D* are exogenously given, we have

$$\dot{M} = \dot{R} \equiv H \equiv B \equiv -eH^* \equiv -e\dot{R}^* = -e\dot{M}^*. \tag{10}$$

(10) implies that the supply of money is endogenous. This reflects the interdependency of national economies.

The last assumption which we need to close the model is

$$R + eR^* = \bar{R}, \tag{11}$$

i.e., the total amount of foreign reserves (e.g., gold and SDR's) is exogenously given. In this sense, the model used here is compatible with a gold standard world.

In order to see the details of the adjustment to monetary disturbances, it is useful to construct a "hoarding schedule". The hoarding schedule of the home country consists of a positive relation between p and H for a given M, and it can be derived from (1) and (3). With a given M, in the case of constant real income, the demand for nominal money balances increases with p. As a result, the hoarding schedule of the home country is upward sloping as illustrated by the H_0-line in **Figure 1**. This schedule shifts to the left as M increases due to either a trade balance surplus or a domestic expansionary monetary policy.

By the same token, the hoarding of the foreign country increases as p^* $(=p/e)$ rises or as M^* decreases. Therefore, under a fixed exchange rate regime, the dishoarding schedule of the foreign country measured in home currency (the $-eH_0^*$-line in **Figure 1**) is downward sloping and it shifts to the left when eM^* falls.

Given M and eM^*, the horizontal distance from the H-line to the $-eH^*$-

line indicates the excess demand for goods corresponding to each p. This is easily seen from (4), i.e.,

$$(Z + eZ^*) - (py + ep^*y^*) \equiv -H + (-eH^*).$$

For any distribution of the world supply of money, therefore, flow equilibrium occurs at the intersection of the H and -eH* lines, such as point A in **Figure 1.**

This equilibrium, however, is a temporary one. The reason is that the home country, in our case at A in **Figure 1,** experiences a trade balance surplus [see (9)]. This implies that foreign reserves will move from the foreign country to the home by the amount P_0A. Therefore, the home country, with the larger quantity of money, will hoard less in the next period. This is followed by a leftward shift of the H-line by the amount $b(P_0A)$ [see (3)]. By the same token, the dishoarding schedule of the foreign country will shift to the left by $b^*(P_0A)$.

Assuming that b is greater than b*, the H_0-line will shift further than the -eH*-line, yielding an excess demand for goods, at the prevailing price level, equal to CD in **Figure 1,**[5] and the price level will rise to OP_1. This process will continue until flow equilibrium occurs with no (dis)hoarding, at a point such as $\tilde{P}$. We call this situation a *full* (flow and stock) *equilibrium.* During the adjustment periods, the balance of trade surplus of, and hence the inflow of world money to, the home country decreases and the reverse is expected for the foreign country. However, the price level in both countries will fall (rise) if

5) In order to see this point, consider the following example: Suppose that OP_1=\$1, P_0A=\$100, b=0.8, and b*=0.5. M(eM*) will increase (decrease) by \$100. With given income and the price level, the home (foreign) country will hoard less by \$80 (dishoard less by \$50), i. e., DA=\$80 (and CA=\$50) in Figure 1. With a given supply of goods and a given income, the home country will spend \$80 more on goods and the foreign country will spend \$50 less. Hence, we have the \$30 excess demand for goods.

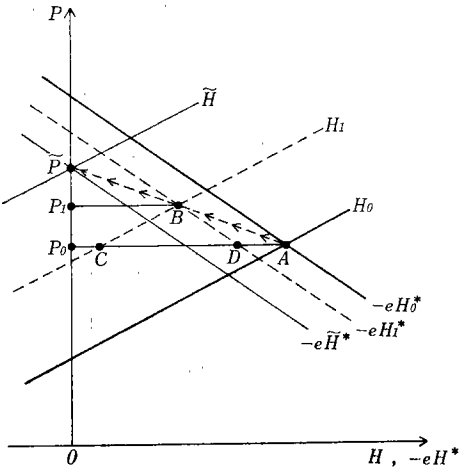

Figure 1

the deficit country shows a faster (slower) adjustment of the actual level of money balances to the desired level. Note, however, that the full equilibrium values of the price level and the international distribution of the world money are independent of the adjustment coefficients in the hoarding functions. This is easily seen from (1), (2), and (3) where H=H*=0 must hold for full equilibrium. The relative size of b and b* is important only for the adjustment (both its pattern and speed) during the periods of (stock) disequilibrium.

In the rest of this section, let us briefly explore the effect of domestic expansionary policy on prices and the balance of payments. Suppose that the economy is in full equilibrium at point $\tilde{P}$ in **Figure 2.** When the government of the home country undertakes an expansionary domestic credit policy (i.e., an exogenous increase in D, which in the present context is injected in the form of a once for all transfer payment), the $\tilde{H}$-line initially shifts to the left while the -e$\tilde{H}$*-line remains intact. Because

of the creation of domestic credit, M rises initially with the result that the home country wants to dishoard by the amount $\tilde{P}R$ in **Figure 2**. At this particular moment of time (before the price level responds),

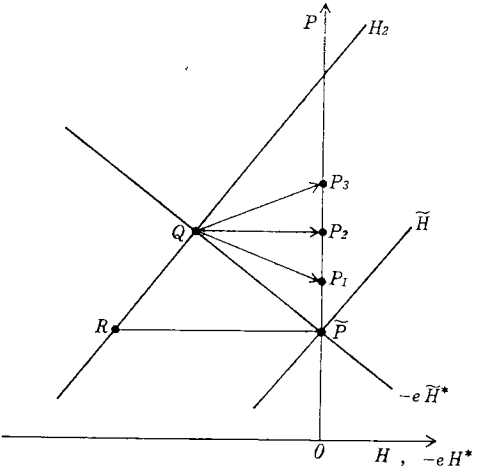

Figure 2

no foreign country variables are disturbed. With an unchanged supply of goods and price level, residents of the home country desire to spend more on goods by an amount to the increase in their dishoarding. As a result, the excess demand for goods in the world market equals $\tilde{P}R$ and the price level rises to OP_2. Hence, the initial impact of the expansionary domestic credit policy is world inflation and a balance of payments deficit for the country undertaking the expansion.

This temporary equilibrium is disturbed by a continuous outflow of the foreign reserves to the foreign country. If b is greater (smaller) than b*, the world economy will adjust itself, as we have discussed, from Q to P_1 (to P_3). If b equals b*, however, the initial impact on the price level will continue to hold over time. An interesting result

of this exercise is that, when b is greater than b*, the initial impact on the price level is overshooting.

III Toward A More General Analysis

Thus far, the discussion has been aimed to clarify essential aspects of the monetary approach in its simplest form. In this section, on the contrary, we present a basis for a more generalized application of the monetary approach.

Any *generalized* theory of this approach must begin with the *generalized* budget constraint. For the clarity of comprehension, it is convenient to divide the economy into two sectors; private sector and government sector. The budget constraint of each sector is summarized in **Tables 2 and 3** separately.

Given these two accounts, it follows that

(a) Trade Balance surplus $\equiv [Y_e - (E_e + G_e)] - [(E_m + G_m) - Y_m]$,

(b) Service Account surplus $\equiv [R_f - (\bar{R}_{tg} - R_{tg})]$,

(c) Capital Account surplus $\equiv [-B_f + (\bar{B}_{tg} - B_{tg})]$.

In these relations, note that $(\bar{R}_{tg} - R_{tg})$ measures net interest payments to the foreign holders of government bonds. By the same token, $(\bar{B}_{tg} - B_{tg})$ equals the net sales of government bonds to foreigners. Thus, the Balance of Payments surplus (BP) is

$$BP \equiv (H - \Delta D) + Xn + Xna,$$

where

$$Xn \equiv E_n + G_n - Y_n,$$

$$Xna \equiv B_n + B_{ng} - \bar{B}_{ng}.$$

can be understood, if *ex ante*, as an excess demand for nontraded goods

and that for nontraded financial assets,[6] respectively. $(H - \Delta D)$ in the above relation reflects the hoarding of the considered country as a whole because ΔD is actually the dishoarding made by the government, while H is the private hoarding.

Table 2: Private Sector

sources of income	uses of income
income from the production of exportables (Y_e)	expenditure on exportables (E_e)
income from the production of importables (Y_m)	expenditure on importables (E_m)
income from the production of nontraded goods (Y_n)	expenditure on nontraded goods (E_n)
net interest income from holding foreign assets (R_f)	net purchase of foreign assets (B_f)
	net purchase of nontraded domestic private assets (B_n)
interest income from holding traded government bonds (R_{tg})	purchase of traded government bonds (B_{tg})
interest income from holding nontraded government bonds (R_{ng})	purchase of nontraded government bonds (B_{ng})
	net tax payments (T)
	hoarding (H)

This fundamental relation has been extensively used by the monetary approach model. In the present reviewer's best knowledge, Mundell [5] is the first contribution which incorporated this relation into an analysis of the disequilibrium adjustment of macro variables in the context of an open economy. Needless to say, each term of the fundamental relation must be reinterpreted depending upon different analytical objectives.

6) If *ex post* B_n will always be zero.

Table 3: Government Sector

sources of income		uses of income	
net tax revenue	(T)	expenditure on exportables	(G_e)
		expenditure on importables	(G_m)
		expenditure on nontraded goods	(G_n)
sales of traded government bonds	($\bar{B}_{tg}$)	interest payments on traded government bonds	($\bar{R}_{tg}$)
sales of nontraded government bonds	($\bar{B}_{ng}$)	interest payments on nontraded government bonds	(R_{ng})
creation of the domestic components of the money	(ΔD)		

For example, when we are interested in observing the effect of fiscal actions, it would be suggested to rewrite ΔD as

$$\Delta D \equiv [(G_e + G_m + G_n) + (\bar{R}_{tg} + R_{ng})] - [T + (\bar{B}_{tg} + \bar{B}_{ng})].$$

By so doing, we could if we want to develop a model which pursues the effect of changes in the level and composition of government expenditure and its finance.

Any variant of the model, however, must be consistent with the fundamental constraint(s). This spirit of the monetary approach is summarized, by Jacob A. Frenkel and Harry G. Johnson, as follows: "[A] consistent use of the budget constraint implies that the money account – the current rate of change of reserves – can be analyzed in terms of the determinants of all the other accounts. . . . The monetary approach, however, recommends an analysis in terms of the behavioural relationship directly relevant to the money account, rather than an analysis in terms of the behavioural relationships directly relevant to the other accounts and only indirectly to the money account via the budget constraint. . . .

[T]he monetary approach should in principle give an answer no different from that provided by a correct analysis in terms of the other accounts. The main reason for preferring the monetary approach is that less direct alternative approaches have almost invariably attempted to explain the behaviour of the markets they concern themselves with by analytical constructs in which the role of money in influencing behaviour, and the connection between these other markets are neglected as being 'of the second order of smalls', which.... cannot be so for an analysis which aims to explain or predict behaviour in the money market." (Frenkel and Johnson [2, p. 22]).

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